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TRANSLATIONS ON ENVIRONMENTAL QUALITY

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BRIEFS

USSR-U.S. ENVIRONMENTAL CONFERENCE--Tbilisi, 7 Sep TASS--A Soviet-American conference on plant protection ended in Tbilisi, the capital of Georgia (Caucasus). The conference was held in accordance with the inter-governmental agreement between the USSR and the USA concluded in 1972. The plans and programme of cooperation for 1979-1980 were determined at the conference. The next meeting of Soviet and American scientists is planned to be held next year in Washington. The head of the U.S. delegation, Dr Tweedy, told a TASS correspondent that environmental protection is a problem for entire mankind. Cooperation of the USSR and the USA in this sphere proceeds successfully. [Text] [Moscow TASS in English 0927 GMT 7 Sep 78 LD]

SYMPOSIUM ON ENVIRONMENT ENDS--TASS--Legal questions of environmental protection were discussed at a Soviet-American symposium which ended yesterday in Moscow. This was the fourth meeting between the USSR and U.S. jurists, who are studying this problem within the framework of the Soviet-American agreement concluded in 1972. The agreement envisages cooperation on 11 major problems. These include the prevention of pollution of the atmosphere and reservoirs, the improvement of the urban environment, the forecasting of earthquakes, nature protection and the organization of reservations and the study of the biological and genetic consequences of environmental pollution. [Text] [Moscow PRAVDA in Russian 20 Sep 78 p 4 LD]

USSR, NORWAY ENVIRONMENTAL TALKS--Moscow, 27 Sep TASS--A meeting between Leonid Yefremov, first deputy chairman of the USSR State Committee for Science and Technology, and the Norwegian Minister for Environmental Protection Gro Harlem Brundtland was held at the committee today. They discussed questions of scientific-technical cooperation between the USSR and Norway in the field of environmental protection. The Norwegian Ambassador in the USSR Petter Graver took part in the conversation. [Text] [Moscow TASS in English 1851 GMT 27 Sep 78 LD]

OIL POLLUTERS TO BE TRACED--The Baltic states, that is to say, Sweden, Denmark, West Germany, the German Democratic Republic, Poland, the Soviet Union and Finland have signed an agreement in regard to an effort in the field to mark oil residues. Bo Turesson, Sweden's Minister of Communications, made this known on Tuesday in Stockholm. The method of marking, which is Swedish, involves metal particles being put into the ship's tanks after unloading. Different combinations for each vessel makes it possible to identify a ship which has discharged oil. Experiments will begin in the spring of 1979 and will continue for a year at the most. The method was tried out in Sweden in 1975. Sweden will contribute to the experiment the help of experts, secretarial functions and a central register at no cost to the other Baltic states. Minister Turesson said on Tuesday that it is very gratifying that a common experiment has materialized. He hopes that the other Baltic states will be convinced about the possibilities of controlling oil discharges in the Baltic Sea by this method. [Text] [Helsinki HUFVUDSTADSBLADET in Swedish 13 Sep 78 p 7]

CSO: 5000

OIL SLICK POLLUTES SOUTH COAST

Perth THE WEST AUSTRALIAN in English 27 Sep 78 p 1

[Text]

A big oil slick has been washed on to the south coast between Point D'Entrecasteaux and the mouth of the Gairdner River.

The oil has polluted beaches and rocks along a 13km section, including the Windy Harbour holiday resort.

Thick globules have been deposited in a continuous strip about a metre wide.

However, people at Windy Harbour have not noticed any effects on seabirds or marine life.

The slick was blown ashore by strong winds on Saturday night.

Mrs Ann Moore, the wife of the caretaker at Windy Harbour, said yesterday that the slick had ruined the beach. It would be difficult to clean before holidaymakers arrived next weekend.

Samples

The coordinator of the State committee for combating oil pollution, Capt. W. P. Spencer, said yesterday that he was waiting to receive samples of the oil and further reports on the extent of the slick.

If it was left long enough the oil would be cleaned up by the weather. But other action might be necessary if it was affecting normal activities in the area.

The oil could have been discharged by a tanker or any ship travelling round the coast, he said.

It was possible for samples to be analysed and traced back to the one responsible if the ship loaded or discharged at any Australian port.

People responsible for oil discharges off WA are liable to fines to $50,000.

CSO: 5000

ENGINEER REPORTS NO CHANGE IN EMISSION LEVELS

Perth THE WEST AUSTRALIAN in English 4 Oct 78 p 10

[Text]

Authorities had found no improvement in the air in cities in other States that introduced stricter vehicle emission controls two years ago, a chief engineer with the Royal Automobile Club of WA claimed yesterday.

Mr D. Pitcher told the conference that the capital and expertise currently being invested in emission control might be better spent in updating the power plants of motor vehicles.

Though two years might sound a short period, it should be realised that 60 per cent of the distance covered in Australia was done by vehicles less than two years old.

Emission control would become largely self-regulatory in time by virtue of the law of supply and demand.

He said that lead emission, which was not subject to legislation in WA, was one of the easier pollutants to control by use of catalytic converters or lead traps rather like mufflers.

There was no need to use lead as an octane improver, but the resultant costs in dispensing with it would be passed on to the end user.

CSO: 5000

CONSERVATION FOUNDATION WORK INCREASINGLY CONSTRUCTIVE

Brisbane THE COURIER-MAIL in English 23 Sep 78 p 15

[Text]

CONSERVATIONISTS did not deserve a reputation of being negative minded and standing in the way of what others wanted to do, according to the Australian Conservation Foundation president (Dr. H. C. Coombs).

Mr. Coombs made the claim in the foundation's annual report.

"I do not think this was ever true of conservationists generally, but is even less true today," he said.

"The work of the foundation is increasingly constructive — to help develop positive plans to ensure the wide use of our resources, and to widen the opportunities for the healthy enjoyment of the world we live in," he said.

Mr. Coombs said he believed the positive emphasis would continue to grow.

The tasks for which the foundation was formed were becoming more urgent, he said.

"The mounting pressure of population on the limited resources of our world is reflected in the rising costs of materials essential to man's future.

"The damage done to the physical context in which we live, and to the other living species with which we share it is evidenced by the steady reduction in their population, and the increasing numbers of endangered species," he said.

Charges

Mr. Coombs said there had recently been changes in the emphasis of the foundation's work.

Originally the concern was for the preservation of the natural environment and the wildlife which inhabited it.

"However it has become apparent that the threats to man's habitat are not confined to his encroachment on the remaining natural areas."

Conflict

Mr. Coombs said air and water pollution, the intensifying energy crisis, anxiety about nuclear fuels, famines, poverty, the spread of deserts and the disappearance of life styles and cultures of primitive peoples were evidence of the conflict between the demands of industrial civilization and the preservation of man's habitat.

The resolution of the conflict would require fundamental changes in the values of industrialised society, he said.

CSO: 5000

RADIATION ACCIDENTS REPORTED AT BARC

Madras THE HINDU in English 24 Sep 78 p 12

[Text] New Delhi, Sep 23--Highly placed sources in the Department of Atomic Energy (DAE) have revealed details of a few accidents involving radiation at the Bhabha Atomic Research Centre (BARC) at Trombay.

In one accident, radioactive aluminum pipes "escaped" from the BARC and ended up in the Bombay scrap market.

In another case, a worker got heavily dosed with radiation after he stole highly contaminated gold and hid it in his clothes.

In a third incident, radioactive liquids spilled from a broken pipe contaminating a huge area of land that later had to be cleared in a big earth-moving operation.

The sources, who did not want their names to be revealed, said these incidents occurred three-to-four years ago. The public did not know of these earlier because of the thick veil of secrecy around the BARC.

The first incident was caused by vandals who had their eyes on the several tonnes of aluminium pipes and rods buried in the "Gamma garden" behind the plutonium plant.

They were not ordinary aluminium pipes. They had been used as "claddings," or sheaths for the fuel rods of the Canadian-built CIRUS reactor also in the Trombay complex.

According to the sources, the "spent" fuel assemblies from CIRUS are normally brought to the plutonium plant where the burnt-out fuel rods are removed for reprocessing to recover plutonium. The aluminium claddings which are not reprocessed but are highly radioactive are left buried underground at the Gamma garden which is Trombay's nuclear graveyard.

Armed with radiation detecting Geiger counters, the BARC scientists tracked some of the radioactive aluminium in the Bombay market.

The sources said to this day no one knows how much of the contaminated material was in circulation or about the extent of hazard it caused to those who handled it.

After the incident, a fence was put round the Gamma garden and guards were posted.

The second incident involved a semi-skilled worker in the plutonium plant, which is now shut down for decontamination to facilitate what the DAE officials call "expansion."

The worker stole gold foils from one of the rooms without knowing that they were heavily contaminated with radioactivity.

He first put the gold in his locker and later hid it in his clothes while going home. By the time the crime was tracked down by the Geiger counters, the worker was heavily contaminated--body, clothings and all.

In the third incident, the BARC health physicists noticed high radioactivity in the compound of the plutonium plant "some three-to-four years back." It was found that the radioactive solutions which were going to the sea in a plastic pipe were leaking.

The leaking solutions contaminated the ground around the plutonium plant. The whole area of about three acres was dug up to four feet depth and the earth was dumped into the sea, the sources said.

Meanwhile, Mr B. S. Sharma, a representative of the BARC scientific community, has sent a letter to the Prime Minister, Mr Morarji Desai, urging "a high level and impartial enquiry into the affairs of the DAE."

The letter said the BARC scientific community was "very much concerned over the grave problems like radiation pollution and hazards to staff and environment at Tarapur and the BARC, and the widespread frustration among staff due to negligence, mismanagement and nepotism."

CSO: 4220

NO TRACE OF RADIOACTIVITY AT POKHARAN

Madras THE HINDU in English 24 Sep 78 p 12

[Text] New Delhi, Sep 23--Regular environmental monitoring studies conducted by the Atomic Energy Department so far have not revealed any radioactivity in the samples of soil, water and vegetation around Pokharan where India exploded an underground atomic device in May 1974.

According to information available from the department, the studies also did not indicate any movements of radio-nuclides from the site at a depth of over 100 metres.

Several scientists had voiced fears on radioactive contamination around Pokharan and its effect on the neighbouring population after the Prime Minister, Mr Morarji Desai, had stated in the Lok Sabha that the environmental hazard of plutonium residues left behind by the atomic device in the 100-metre-deep hole drilled for explosion was yet to be assessed.

These fears have now been set at rest by the facts revealed by the department.

According to the department, in the experiment conducted at Pokharan, adequate precautions were taken to see that no radioactivity was released.

In such experiments, the residual plutonium gets mixed with the large quantity of molten rock produced because of the high temperatures at the time of the experiment.

On cooling, this mixture becomes a hard glassy material distributed around the explosion point at a depth of over 100 metres.

Since the total rainfall in the desert area at Pokharan is very small, even if this glassy material is accessible to rain water, the radioactivity that may be leached by this water will remain localised underground, it is explained.

CSO: 4220

GOVERNMENT WILL ISSUE REGULATION ON WATER POLLUTION

Jakarta KOMPAS in Indonesian 8 Aug 78 pp 1, 12

[Article:"Regulation Controlling Water Pollution Being Drafted"]

[Text] The government is drafting a regulation on controlling water pollution. The drafting team, already formed, is comprised of officials from the departments of public works, health, industry, internal affairs and agriculture.

This information was given on 7 August by State Minister for Supervision of Development and Environment Professor Dr Emil Salim. He had just finished chairing a meeting on the environment at the department of industry. The meeting was attended by Minister of Industry Ir [engineer] A.R. Suhud, the deputy chairman of BKPM, several directors general and others.

According to Emil Salim, in the regulation, a water standard will be established for the full range of national usage. This is needed because the same water can be used for drinking water, for fishponds, for bathing, washing and toilets, for disposal of industrial waste and for irrigation. In addition, it will also be decided which agency will supervise implementation of the regulation and what sanctions apply.

Still No Water Standards

There still aren't any national water standards covering the full range of usage. For large cities, only Jakarta has a governor's decree on water quality standards for water bodies based on how the water is used. The governor's decree, No 484 dated 30 June 1977, established water quality criteria, based on how the water is used, for the metropolitan Jakarta region. This water quality criteria also regulated waste discharged into the rivers.

Emil Salim said thatwater quality regulations are still being drafted for the cities of Semarang and Curabaya like those in

effect for Jakarta. Thus in reality waste water disposal standards for large cities have only received attention since 1977 and only on an individual basis.

In addition he said that in 1977 the minister of health also issued a decree on control of water pollution for bodies of water which are multi-purpose in use and are related to health. The minister of health's decree, No 173 of 1977, establishes waste quality regulations, liquid waste storage and leakage supervision methods and sanctions.

The department of industry through minister of industry decree No 12 of 1978 has also regulated preventive and protective activities against environmental pollution caused by industry. The regulation is in effect immediately for industries built after the regulation was issued. However, a period of 3 years has been given to industries built before the minister's decree was issued to adapt to it.

It is necessary for large cities to determine their own waste water quality criteria, he said, because conditions from place to place will differ. For example, the acid content level or the level of organic pollution (B.O.D. = Biochemical Oxygen Demand, is the amount of oxygen needed for the biochemical destruction of organic materials in the waste) will differ from river to river in the same region. It will also differ between regions. "Therefore, without lessening the impact of the minister of health's regulation, it is still necessary for each regional government to establish waste water standards," he said.

The S.D.C. Case

Minister Emil Salim added that the Semarang Diamond Chemicals (S.D.C.) Ltd factory which produces calcium citrate began production in 1977 at the same time the regulation was issued by the minister of health on water waste pollution control. The case of pollution by the S.D.C. factory, however, is basically a local problem and one which only took place at certain times.

Therefore the pollution could be corrected locally by the regional government. The decision made by the local government is said to be a result of investigations carried out by various agencies such as those concerned with chemical industries, health, irrigation and the regional government. The solution

will probably be to increase the treatment of the waste and in addition to require payment to be made to those who have incurred losses," he added.

According to the minister, the chemical industry team which carried out the investigation on the S.D.C. pollution case has completed its w-rk and is not compiling its complete report. However, the main point is that pollution took place because of the overflow of industrial waste which had previously been in storage. The overflow of the waste was due to the heavy rains in July.When rainfall is normal, or during the dry season, the industry's waste can be channeled off with a waste concentration that isn't too high. This doesn't pollute the environment. Pollution only takes place during the periods of heavy rains, so that it can be said that the pollution took place only at specific times, according to the minister. "However, the S.D.C. case can be a lesson to us all," he added.

Concerning improvement in or increase of the waste water treatme-t, Emil Salim aaid that included in the improvements which must be made is the deepening of the waste storage areas. This will remove the possibility of there being any waste water overflow. Or if there is an overflow, the concentration level of the waste won't pollute the environment.

7785
CSO: 5000

POLLUTANTS FROM CHEMICAL FACTORY KILL CROPS, FISH

Jakarta KOMPAS in Indonesian 3 Aug 78 pp 1, 16

[Article: "Pollution By SDC Factory Has Continued For a Long Period"]

[Text] The S.D.C.Ltd factory producing calcium citrate which is located in the city of Semarang was still in operation on 2 August. Meanwhile farmers in the village of Tapak, Tugu subdistrict, through whose land the factory waste flows, continue to complain. They point to the small river with its dark greyish water. It is this polluted water which has caused the fishponds and sawahs to be unable to produce anything.

KOMPAS sources at the Semarang Health Laboratory say that the pollution which is a result of the waste from the S.D.C. factory has in fact continued for a long period. Investigations by the laboratory which were conducted the middle of last year concluded that the pollution is dangerous to the area around the factory. The report signed by Dr Hertanto says the waste water from the S.D.C. factory contains ammonium and H_2S. These two chemicals have poisoned the surrounding environment of the factory. This includes the surrounding waters and its main result has been to disorient the fish.

Based on these investigations, the S.D.C. factory has been ordered to equip itself with waste filtering equipment. This equipment is expected to neutralize the waste released into river which directly irrigates the area where the people live.

Inconsistent

However, by the middle of July of this year, the fish in the ponds and the rice in the sawahs were still both dying. A deputy chief of Tapak village,Amat Suaeb, told KOMPAS that the factory was often inconsistent in using its [new] filtering equipment. If the rains came, they would open the valves wide

open. Perhaps they hoped that the waste would be dissolved away with the rain water. But then again, the valves were were often opened when it wasn't raining heavily. Suaeb said that when it was only sprinkling, the river would be overflowing with the waste. That was proof that the water filter valves were open.

The pollution caused by the S.D.C. factory isn't only limited to the waste. Those living within a radius of 1 km of the factory complain about the rancid smell which constantly per meates the air. The smell is very strong, especially if the wind is strong.

The people say that if it doesn't rain, the result would be an even stronger smell. The environmental pollution was strongly felt last year. During the dry season all water sources for the Tapak village became smelly and couldn't be used. The people were forced to get drinking water from other villages. To describe how complete the pollution is, the people say that even the well at the mosque couldn't be used for ritual ablution. The smell of the water is also very irritating to the nose and it has a cloudy, dark, greyish color.

An official of the S.D.C. factory told KOMPAS that on 30 June 1978 the plant doctor warned his patients about an eye infection which was spreading. He took several safety measures to stop the disease spreading. It still isn't clear if the eye infection is caused by the factory's pollution.

The people who live there have asked the government to quickly intervene and investigate the case. Simply giving money to make up for losses isn't considered to be a full solution to the problem. In the first place, the amount of money is always small compared to the loss of fish and rice by the people. And then the people are always haunted by the possibility that there will be a reoccurance of the situation later.

In all 53 fishpond owners and 37 farmers have had losses. Their daily means of livelihood are gone. Several fishponds, grown up with underbrush through neglect, were shown to KOMPAS This happened because there were no longer any fish alive in them. There were also sawahs which had gotten so much waste water from the factory that the topsoil was almost gone and the rice unable to grow, dried up. According to records, the S.D.C. factory hires some 200 workers. Most of them are in lower possitions with wages of only 300 rupiahs a day plus one meal.

PROSECUTOR CHARGES LOGGING OPERATION CAUSED FLOOD

Jakarta SINAR HARAPAN in Indonesian 10 Aug 78 pp 1, 12

[Article: "Brought To Court Because of Timber Cutting And Deliberately Causing Flood"]

[Excerpt] On 9 August the court of first instance at Tulungagung, East Java began hearing the case of S.S. alias T.H.T. (46 years old) and L.D.L. charged with deliberately causing a flood in the region by cutting timber from a 56.2 hectare stand in November 1976. This resulted in 16 people being killed and 507 being injured. Damage caused is estimated at almost 500 million rupiahs.

According to information gathered by SINAR HARAPAN, this session is the first of its kind in Indonesian court history in which an accusation was made against people for causing a flood.

General prosecutor Zainal Sungkono charged the two with deliberately causing a flood by cutting timber from stand 197 of the Besowo block, located in the village of Gondanggunung, Pagerwojo subdistrict on the slopes of Wilis Mountain in the Tulungagung district.

The timber cutting was initiated by S.S. as director of M. Co Ltd within the framework of planting menthol-producing plants in cooperation with N.K. Co Ltd, concession holder for the enterprise.

For 21 days beginning on 24 August 1976 they succeeded in cutting 56.2 hectares of forest using 58 workers, under the supervision of L.D.L. They were then stopped by State Timber Co officials from Pagerwojo who felt they had no official permits from the State Timber Co.

The general prosecutor said that the timber cut was on a steep

of the mountain which had an incline of between 30 and 40 degrees. It was a thickly wooded area so that when the rains came, it caused a flood. On 13 November 1976 a landslide took place and the flood waters carried the cut timber through the region where the Song river flows. The result was that 10 villages in the Kauman subdistrict of Kalangbreh, Tulungagung were inundated by the flood with the casualties mentioned above.

7785
CSO: 5000

GOVERNMENT WILL BE TOUGH OVER CHEMICAL SPILLS

Auckland THE NEW ZEALAND HERALD in English 20 Sep 78 p 3

[Text]

The Government seems ready to take a tougher line on chemical spillages.

There have been at least nine chemical spillages and leaks in Auckland this year.

And more than 30 school children, seamen, truck drivers and waterside workers have gone to hospital in the last seven months after chemical incidents.

The latest bad accident, at Freyberg Wharf on Monday, sent 11 men to hospital.

Not Met

The Minister of Internal Affairs, Mr Highet, suggested last night that prosecutions could follow Monday's incident.

It appeared from reports of the spillage that requirements of the legislation had not been met, the minister said. There could be a case for bringing prosecutions.

Other government moves under consideration are a revised list of dangerous goods and more standardised labelling.

If the Government does tighten chemical handling regulations, it will endear itself to the Auckland City Council.

The deputy mayor, Mr J. R. Firth, yesterday called for the Government to allow tougher bylaws on chemicals.

"The legislation isn't strong enough," he claimed.

Mr Firth accused the Government of treating the problem casually.

The city council was looking for the opportunity to create stiffer bylaws.

Take Courses

The Auckland Fire Service technical liaison officer, Mr M. A. H. Perkins, would like to see men working on the wharves, truck drivers and warehouse workers taking courses on chemical handling.

Mr Perkins also sees the need for clearer labelling of chemicals. There was a lack of understanding everywhere of exactly what labelling was required.

Fine Print

He said there was possibly a need for a completely different type of label for bulk chemical tanks.

"If someone drops a big tank, you can't get up close to see the fine print."

Mr Perkins said the volume of chemicals coming into Auckland had dropped off, perhaps because of the economic downturn.

Because of this, the number of chemical spillages was now less than in the city 18 months ago.

Relief for city residents worried about chemical spillages and leaks could come with a report from a committee set up by the Government to examine handling controls.

Mr Highet said he expected the committee to report shortly. While he had been assured that present regulations were adequate, the committee was looking at ways of tightening them up.

Footnote: Another leak sent firemen into action in Auckland yesterday. Two leaking drums of weedkiller chemical caused the incident, the second in two days at Freyberg wharf. The drums were from the freighter Hupeh.

CSO: 5000

TOXIC DISCHARGE KILLS EELS, MAY DESTROY WATERFOWL

Christchurch THE PRESS in English 28 Sep 78 p 1

[Text] It may be another five days before the full effects are known of the pollution of the Heathcote River yesterday by toxic chemicals.

The oily material escaped from the Christchurch Gas Company's Moorhouse Avenue works into stormwater drains, Bells Creek, and from there into the Heathcote River, the Christchurch Drainage Board reported.

It is only six weeks since 12,000 litres of light oil escaped from the Gas Company's works the same way, also affecting wildfowl.

The Drainage Board has referred both incidents to its solicitors.

Large numbers of eels were seen writhing and swimming upside down yesterday, and some people had reported finding dead eels. A few affected ducks had been reported to the North Canterbury Acclimatisation Society, said the chief executive officer (Mr B. Webb).

The river was too muddy, however, after recent rain to see whether any fish had been harmed, he said. The eels' behaviour would result from damage to their gills and brains, said Mr Webb.

Mr Webb said the pollutant was apparently a phenol-type solution. He described it as a "pretty dangerous chemical. Even the fumes in sufficient concentration can cause severe sickness in humans. It can kill very quickly if taken in solution," he said.

The effects on ducks were not likely to be seen for another five days, as the chemical would have to seep through the feathers and skin into the blood-stream.

Once this happened, the ducks would "doze off" and die, he said. A workman, who went out on the river yesterday morning to look at the pollution, was forced to leave the river because the fumes had given him a headache.

The acclimatisation society was working with the Christchurch Drainage Board, which he hoped would "take legal action," said Mr Webb.

"It is one of these things that is becoming all too common. It is all very well taking protest action and going to court once it has happened, but if no one takes any action it's all a waste of time," said Mr Webb.

A discharge of petroleum products was first noticed yesterday morning flowing from Bells Creek. Inspectors of the Drainage Board were on the scene about 7:30 a.m. and traced the discharge through the stormwater drain to the Gas Company's outlet.

A straw barrier was put up at the mouth of Bells Creek and a suction tanker was used to draw out as much of the pollutant as possible. By late afternoon most of the pollutant had been removed, according to a Drainage Board employee.

The board's chief engineer (Mr P.J. McWilliam) said the matter would be referred to the board's solicitors.

The general manager of the Gas Company (Mr C.W. Kennedy), said the company was deeply concerned that there had been an accident apparently during the night at the Moorhouse Avenue works.

"The accident is being investigated and the company has invited a major engineering consultancy firm to assist in tracing the cause of the accident, said Mr Kennedy. He said that once the cause had been established it would be remedied as soon as possible.

CSO: 5000

MAJORITY OF MIDDLE EAST'S LARGER ANIMALS 'VIRTUALLY EXTINCT'

Beirut EVENTS in English 6 Oct 78 pp 46-47

[Part III of article: "Environment Under Siege"]

[Text]

"From Turkey in the north to Yemen in the south, the majority of the Middle East's larger wild animal species are now virtually extinct," says Feisal Abu Izzedine, regional adviser on wildlife conservation to the United Nations Environment Project.

This sad result stems partly from the steady environmental erosion which the region has experienced in recent centuries – a deterioration which has accelerated greatly over the past few decades, through what one eminent writer described as "misdirected efforts to exploit nature in ways which nature cannot tolerate." The massive destruction of rangelands and forests meant the onset of desert conditions in vast tracts of land, robbing many species of their natural habitat.

As though this man-inflicted calamity were not enough, those species which might otherwise have survived found themselves the target of an unremitting assault by hunters using methods which turned the traditional skilled sport into coarse butchery. Within the space of a few short decades, species which had roamed the area in their thousands were brought to the verge of extinction.

Hunting had, of course, always been a feature of Middle East life, as elsewhere. Murals in eighth century Omayyad hunting lodges in Jordan depict hunting scenes in an area which was clearly then teeming with wildlife, though it is now a near-lifeless desert. It is, however, doubtful whether hunting by traditional methods had much impact on the status of the hunted species. On the contrary, like the activity of other predators, it may have served to improve stock by weeding out the weak and infirm.

Nevertheless, the Asiatic lion died out in the Middle East between the thirteenth and fifteenth centuries. But the real spate of casualties came later, beginning towards the end of the nineteenth century. By 1900, the roe deer, addax antelope, crocodile and Syrian bear had become extinct in most of the Arab world although a few bears are still thought to survive in the remoter Turkish mountain ranges.

The Syrian onager (wild ass) and the fallow deer disappeared by the early 1920s, to be followed by the Arabian ostrich in the 1930s. Surprisingly, perhaps, the cheetah and leopard seem to have held out until the early 1960s, when the last recorded specimens were shot. The Arabian oryx was exterminated in most Arab countries, and is now probably extinct in the wild. A

number of other species found themselves pushed ever closer to the wall: the ibex (a mountain goat) and the wolf died out in many areas, and the once-plentiful gazelles and houbara bustards suddenly became a rarity.

The introduction of modern firearms and the widespread destruction of forests (particularly by the Turks to provide wood for the Hijaz railway in World War I) undoubtedly played a major part in this process. But the use of fast vehicles and even aircraft to run down prey was probably the major factor in wiping out the hunter's traditional quarry, the gazelle, the houbara bustard and the oryx.

Describing the motorised persecution of the houbara, Guy Mountfort – who led scientific expeditions to Jordan in 1963 and 1965 – wrote: "Like the gazelles, it is paying the price for providing a big enough target for trigger-happy men who roam the desert in fast cars looking for something – anything – to kill for the fun of killing." Mountfort's 1963 expedition spent many weeks roaming the country but saw not a single houbara, and spotted only eight distant gazelles. Around the same time, some of the last oryx recorded in the wild were slaughtered in south Arabia by a motorised hunting party which had driven hundreds of miles across the desert for the purpose.

Despite the enormity of the damage already done, the persecution of dwindling species continues: old habits die hard. Even in Jordan, where social discipline and respect for the law are greater than in some other Arab countries, gazelles are still shot despite the year-round official hunting ban. Some of the gazelles stray unsuspectingly across the Jordan from Israeli-held territory, where they are protected. "People here are trigger-happy, they like to shoot," said one Jordanian conservation official.

People are trigger-happy in Lebanon too, and it is here that an appalling twice-yearly slaughter takes place at the time of the spectacular migration of birds of prey, whose long journey to and from their breeding grounds to the north unfortunately takes them along the Levant coast. Anything from shotguns to machine guns is used to bring down as many as possible of these birds, whose bodies are then proudly displayed at the roadside for sale to passing motorists. The migration, which includes dozens of different species of eagles, buzzards, vultures, falcons and hawks, is one of the most striking events in the ornithologist's world. The Lebanese have also succeeded in wiping out or severely restricting many of their resident breeding species through indiscriminate year-round hunting despite prohibitive legislation.

Given the prevailing attitudes and the difficulty of protecting threatened species in the wild, it is not surprising that the efforts of conservationists have been centred on simply trying to keep species alive in captivity, with the ultimate aim of releasing them (or their issue) into the great outdoors if it should ever be safe to do so.

These conservation efforts are currently in their infancy. "There is no functional nature reserve or national park in the Middle East today," says Feisal Abu Izzedine, who has just given up his job as regional adviser on wildlife conservation to the UN Environment Programme (UNEP) to help set up a wildlife sanctuary. "If anything is to be done, it's in the field. How can the UN plan or coordinate something if it doesn't exist?" he says.

Work is already well advanced on the 800 hectare al Areen sanctuary which Izzedine is to manage in Bahrein, and which he describes as "one of the first comprehensive attempts at wildlife conservation in the Middle East." It is hoped that the sanctuary will be able to establish itself as the World Captive Breeding Centre for the houbara bustard, as well as breeding oryx, gazelles and other native species. It is also to incorporate the existing Salman Falcon Centre.

As in the case of the al Areen project, which has the enthusiastic backing of Crown Prince Hamad Bin al Khalifa, many of the conservation efforts now beginning in the Arab world have been made possible by enlightened rulers in the conservative states.

One of the first captive herds of Arabian oryx was in fact set up by the late Sheikh Hassem al Thani in Qatar. Saudi Arabia is now establishing the Asir Kingdom park near Abha, to preserve an outstanding mountain area

with unique vegetation. In Oman, there is a full time adviser on the environment to the Ministry of Diwan Affairs, and efforts are being made to preserve the Arabian taher (a species of wild goat). One of the Arab world's very few zoos, boasting some 280 species, has recently been established at Al Ain in the United Arab Emirates. In Jordan, Dibbin Forest has been made into a delightful national park, and moves are underway to expand greatly the area of the Shaumari Desert reserve.

The story of how the oryx survived may well provide a model for efforts to save other endangered species. Its extinction was prevented largely by outside efforts when it became apparent in the early 1960s that the species was otherwise doomed. An expedition was mounted by the Fauna Preservation Society (which has adopted the oryx as its motif) and three wild oryx were captured. Together with six others donated by Kuwait, Saudi Arabia and London Zoo, these formed the nucleus of the World Herd established at Phoenix, Arizona. The herd has now grown to number around 70 and has been split up to different locations for safety's sake. In February, a major step was taken with the shipping to the Middle East of four oryx from the World Herd.

Chosen to welcome the prodigals was the Shaumari Wildlife Reserve, near Azraq Oasis in Jordan, where facilities had been set up for preserving and breeding desert species prior to their re-establishment in the wild. The project had the backing of the World Wildlife Fund, which provided two Landcruisers and the services of the highly-qualified and experienced project leader, John Clarke, formerly director of parks in Zambia.

The four oryx which arrived in February were all males, and now that they have adjusted well to their new surroundings moves are under way to secure mates for them. But the achievement of progress in conservation is agonisingly slow: it took nearly four years for arrangements to be made for the delivery of the four males, and delays are being encountered in finding their mates. The Shaumari reserve has also met disappointment in seeking breeding stock of gazelles from Iran and elsewhere, and it is likely to be some time before its ambitions to act as a re-introducing station for other lost species such as the ostrich, onager and cheetah can be realised. In the meantime, John Clarke has been working on draft conservation laws for Jordan which may act as a model for the Arab states.

The world total for Oryx now stands at around 100-150, and species will not be officially off the danger list until the figure reaches 1,000. But it is clear that baring unforseen calamity, the oryx has been saved, thanks largely to outside efforts. With the establishment of the Shaumari and al Areen reserves and other projects elsewhere, it should no longer be necessary for Arabs to be indebted to the Americans and others for saving for Arabian wide life from extinction. But a great deal of public education and law inforcement will be needed before the next vital step can be risked: the release of these threatened species back into their natural habitat.

CSO: 5000

TUNIS, SFAX POLLUTION PROBLEM EXPLORED

Tunis AL-RA'Y in Arabic 31 Aug 78 pp 6-7

[Article by Anwar al-'Ayyadi and B. al-Murabiti: "Pollution in Tunisia; In the Capital: Pollution in Certain Areas Surpasses That of Paris and London in the Sixties; In Sfax Pollution Reaches Danger Level"]

[Text] The problem of pollution of the environment has emerged in recent months as one of the main problems concerning a large portion of the population and prompting comments and denials. It is surprising that this problem is so important, because pollution is usually a problem of main concern to industrial nations, not to developing countries with generally low industrial development. However, warnings and cries of alarm soon alerted citizens to the danger of the pollution of certain industrial areas in the country. Recently one of the French experts called to study pollution in Tunisia warned that certain areas were suffering from pollution greater than that of Paris and London in the 1960's, before the fight against pollution was organized in those cities. Meanwhile, the problem of pollution is assuming great importance in Sfax where the population has become alarmed, because pollution has reached a dangerous level. The examples of Tunis and Sfax are simply glaring manifestations of a phenomenon which is not limited to them.

Some people, accustomed to defending the status quo, proceeded to claim that pollution is the tax of industrialization, and they attempted to minimize the gravity of the problem. The government began planning certain purification projects and projects to combat pollution. However, citizens cannot accept the justification of dangers which could have been anticipated and met. The projects which have begun to be implemented are minor and limited in scope. There is no wide-scale activity, only operations having to do with certain areas or specific sources of pollution. Therefore, the problem is still present in its entirety, with all its significance. Pollution is a problem awaiting a comprehensive, radical solution. The file on pollution is open so citizens may have their say about it. The following is our publication of the first part of a report we have drafted on pollution in Tunisia.

About Pollution

It is almost certain that the cities of Tunis and Sfax are suffering most acutely from this condition. In Tunis there are several industrial areas like Ben Arous, Megrine, Charguia and Manoubah with various industries and factories which discard their wastes or sewage. Hundreds of thousands of citizens live there, and they dispose of thousands of tons of waste daily. There are thousands of places such as restaurants, shops and hotels which also discard their waste. These wastes are disposed of in two ways: The garbage is dumped in the salt marsh on the Zaghouan road where offensive odors rise and insects gather. There is nothing to prevent their moving on and descending on a person or his dishes, despite the fact that this garbage is treated with DDT.

Liuqid wastes flow into the sewage system and collect at several plants. A large portion of them appear at the al-Sharqiyah plant. However, the sewage system in the capital, approximately 400 kilometers long, is insufficient, and a large part of it is narrow. There is no provision for cutting off parts of the system or for making it impermeable, and these are essential standards for purification and safety. In addition to these pollution factors, there is factory and automobile exhaust and putrid odors coming from lakes, salt marshes and ditches. All of this would not be very dangerous if it were not for the fact that the waste, dust and brackish water contain and carry deadly bacteria, small particles and toxic gasses which threaten living things whether human, animal or plant.

In Sfax, although there are many sources of pollution, it seems that the Siape phosphate plant and the NPK [fertilizer] plant are the main source of the problems from which city residents suffer. The two plants emit phosphate and sulfur dust and fluoride which pollute the soil, the water and the air and spoil the coastline and affect man, agriculture and stock farming. Because of this, residents of the city are suffering from a greater incidence of lung disease. Certain kinds of fish have suffocated in the sea such as the well-known al-qishash. Wooded areas have become desolate. An international expert made an analysis of coastal waters and concluded that they contained enormous quantities of flouride which could cause cancer. Fear spread among the population, even though a Tunisian expert had reached conclusions to the contrary.

Whatever the case may be, pollution in the region has reached a dangerous level which prompted the Sfax Municipality to issue one resolution last year prohibiting swimming along the coast of the municipality and a second resolution this year prohibiting swimming along the entire coastline, with the exception of the al-Shifar beach which is far from the city. This situation is what induced inhabitants of the municipality to demand that the NPK factory be closed or moved from its present location, and it prompted the municipal council to send a note to the prime minister concerning the problem of pollution which, because of its increasing gravity, is causing great alarm and requires immediate intervention.

Besides the cities of Tunis and Sfax, there are others threatened to one degree or another by the danger of pollution, such as Gabes, Sousse and Bizerte.

Pollution: Its Factors and Dangers

Various kinds of wastes are the cause of pollution. They constitute industrial waste, garbage, the waste of service institutions and agricultural wastes. These wastes lead to pollution, whether in dangerous organisms such as bacteria, viruses and parasites; in toxic gasses emanating from smokestacks or the burning of certain materials; in organic matter subject to decomposition and fermentation which produce unpleasant odors and putrid liquids attracting flies and large rats; or in chemicals, toxic mineral salts and petroleum products.

Citizens exposed to some of these biological, chemical and physical agents become seriously ill or get severe infections. There is no way to avoid this except through precautions and halting the spread or flow of infectious agents. The protection of living things--land animals, sea creatures and plants--requires that the greatest efforts be made to combat pollution.

We can better understand the danger of pollution if we define the basic elements in the environment subject to and affected by pollution: the air, the water and the soil.

Air pollution comes from the operation of cars and factories, because their fuels emit dangerous gasses (sulphuric acid from factories and oxides of carbon from cars). Air is also polluted by the factory emission of dust bearing minute particles (like cement dust and fluoride material). These air pollutants affect the respiratory system and cause illnesses with a deficiency of red corpuscles in the blood, lead to nausea and dizziness and hurt the eyes. These pollutants also affect the respiratory systems of animals and plants. The systems are destroyed sooner than they would be under normal circumstances.

Water pollution may result from hydrocarbons, with the transport, discharge and use of petroleum and the mixture of petroleum particles with water. This reduces the oxygen contained in water and may result in the presence of warm particles in the water. This tends to be most harmful to fish and shellfish, affects their flavor and renders them unsuitable for consumption. Water used in industry, homes or places of service is an important factor in the pollution of both sea water and irrigation water. Every use of this water, if it is not treated, and no matter what the intended purpose may be, has some effect on man and the environment.

The soil, including the seashore and agricultural lands, is also affected by pollution as a result of the discarding of wastes. Naturally this pollution creates health and economic problems which are not easy to surmount.

National Office for Purification, Municipalities and the Battle Against Pollution

Purification, as recognized by the World Health Organization, is geared toward man's environment to improve all the conditions affecting or possibly affecting natural growth, health and life expectancy. It has therefore been involved in combatting all forms of pollution since its creation in 1975. The Purification Office in Tunisia has limited its activities to fighting water pollution by collecting, removing and draining used water and reusing it in some cases. The al-Sharquiyah purification plant receives the liquid wastes of an average of 300,000 inhabitants. The wastes are gradually broken down and purified there, and part of them are used to irrigate state land in Biskra. The office has recently begun to implement the purification plan for Tunis to prevent the drainage of used water and rain water into the lake and also to prevent the drainage of used water into the sea by building two purification plants.

This project will make an important contribution toward alleviating the severity of pollution in Tunis. A productive battle against pollution must not stop at these partial, limited measures. What are the office's projects for water purification in Sfax? What are its projects to combat air and soil pollution in all the areas which need them? Are there dozens of factories bombarding citizens with their poisons, still unchecked? Is the health of many citizens still threatened, and are many citizens deprived of enjoying the sea and the seashore? Will constantly expanding areas of cultivated land be left to perish and ever-increasing quantitites of fish left to die? There is no answer to these legitimate questions in the programs and projects of the government and agencies concerned. As long as this situation continues, how can one blame the citizen for being angry and alarmed?

In addition to the purification office, many municipalities have worked to clean cities of garbage and other wastes. They complain of a lack of interest. Whoever walks along narrow streets and alleys may be stopped in his tracks by terrible odors, attacked by an army of flies or tormented by mosquitoes. The work of municipalities in this field requires a great deal of dedication and concern to remove filth in all places and at all times.

For A Comprehensive Plan to Combat Pollution

1. Pollution Conditions and Combatting Pollution

A precise plan must be drafted to eliminate pollution, because of the diseases it causes and the serious illnesses it threatens, in order to guarantee an improved health situation for the segments of the population living in polluted areas. This is one of the rights of citizens guaranteed by the state.

Poor health conditions resulting from pollution directly affect the main forces of production, in other words, the workers. Consequently, pollution

is an obstacle in the way of economic development. Despite this fact, those who initiate projects in most instances pay no attention to the problem of a healthy environment. They prefer to amass profits by all means and refuse to invest in the purchase of pollution control equipment. The mentality of easy profits and brutal capitalist relations is one of the main reasons for the destruction of the environment and the growing danger of pollution.

Also, these selfish interests are currently prompting Western capitalism to try to get rid of the industries which pollute the most, particularly the chemical industries, and move them to developing countries. They thereby get rid of pollution and profit from cheap labor. There is also growing industrialization in chaotic fashion and the absence of a long-term industrialization plan establishing a choice of sites for the concentration of factories far removed from residential areas and facilitating the laying out of sewage systems carrying industrial wastes.

These three phenomena explain the importance assumed by the problem of pollution in a country which is still backward.

If the main cause is the result of social democracy and hateful exploitation, the two other causes are due to economic dependency which puts the country at the mercy of foreign interests and fluctuations abroad and impedes development of the economy toward independence and precise planning. However, there are factors which spur the increase of environmental pollution in several areas of the country. They include the ineffective purification work undertaken by municipalities, the lack of awareness among many citizens of the benefits of a clean environment and the lack of close ties between the municipality and the citizen which would make coordinated efforts possible, as a result of the absence of political democracy in the country.

Thus a change in the economic, social and political situation is a necessary condition for an effective battle against pollution.

2. Ways To Combat Pollution

In this context the relation of the citizen to the environment must be examined from two angles--changing the environment to preserve the health of man and shield him from dangers on the one hand, and maintaining the healthy state of the environment and protecting it from the damage inflicted by man on the other hand. In order to do this, a series of steps must be taken, including the following:

It will be necessary to collect all industrial wastes and either dispose of them or recycle them. The same is true for household wastes and used water. Recycling wastes is much more advantageous than disposing of them. Organic matter subject to fermentation, like household garbage, can be converted into fertilizer to enrich the soil. Used water, if treated biologically and chemically, can be recycled for the irrigation of crops, for industry and for refrigeration. Metals, boards and paper can be produced from garbage.

In general, the recycling of wastes is much more beneficial for the healthy state of the environment, the welfare of citizens and the growth of the economy. Let us not talk about the impossible. Recycling wastes requires the allocation of significant investments and overcoming harmful habits. We base what we say on the fact that prevention is better than cure.

Open canals carrying wastes from factories and plants must be covered. Conduits must be built in place of ditches and used for the same purpose. Industrialists must be forced to use pollution control equipment.

In order to guarantee the benefits of these actions, a scientific center should be set up to combat pollution. It should do laboratory analysis work; determine the extent of pollution, the areas most afflicted, diseases caused by pollution, ways to use wastes which cause pollution; and study new projects from the point of view of their effect on the environment. This center should be independent and able to publish its information with complete freedom. It would therefore be possible to put an end to efforts to cover up, like those that came to light in the Sfax municipal council's receipt of two memoranda. One of them was from the ministry. The first claimed that water pollution along the Sfax seashore was the result of the discharge of filthy household water into the sea. The other was from the Ministry of Health and said that analyses of the central laboratory indicated that sea water in Sfax was polluted by fluoride, phosphate and various industrial wastes.

International regulations should be applied in the field of combatting pollution in all its forms, and laws consistent with these regulations should be rigorously applied.

If we point out the gravity of the problem of pollution in Tunis, it is to both inform the citizen so that he knows the true state of affairs and alert the authorities so they may take the steps which the situation demands to improve present conditions and prevent what might happen. The problem becomes more urgent every day, and the health of thousands of citizens is constantly threatened.

Sfax

Pollution is a serious problem with reverberations on the psychological make-up and health of the inhabitants of Sfax. What is meant by pollution is the spread of fumes in the atmosphere. These fumes are dangerous to man. They are absorbed by particles, particularly diffused dust particles, and are dangerous to those who are exposed to them by breathing in air or by eating polluted food.

One evening in 1976 the sky suddenly became dark in the middle of the city, and the air was covered with dust and became heavy. The population suffered a mass attack of coughing which became so acute as the minutes passed that the sound of coughing arising from everyone's throat drowned out the roar of automobiles and motorcycles!

The regional authorities intervened the next day and made the NPK Company close its doors until it had installed a filter. The company did install one and reopened. Due to the filter, however, pollution was directed toward the sea, and the fish were therefore exposed to the same pollution as the population. Especially affected were the well-known small fish al-sibaris al-zurub which is caught near the coast. This came on top of the 1976 announcement of the closing of the Hishad, Casino and municipal beaches. The impact spread with the closing of the Swimming and Rescue Club, and citizens were therefore deprived of the pleasure of the sea.

Pollution has spread. On Sidi Mansour street it has reached Kilometer 5 at the place called al-khalij. Perhaps pollution's onward march will continue until it reaches the area of the threatened al-Shqaf beach which residents of Sfax regard with impatience and great anxiety. This serious problem has become the subject of conversation among the various segments of the population. The factories and plants which have sprouted in residential areas, especially in the heart of the city, spew their poisons and gasses. The most promiment of these are the Siyab and NPK companies. Citizens have come to feel the dangers to their life and have demanded that immediate steps be taken and practical measures applied to stop pollution.

However, it seems that officials are not eager to obtain results of the pollution analyses submitted to the international Ikobol Company in 1976.

In this case one does not need to await the results of the analyses, because time, no matter how short, does not help the situation. One cannot be content with issuing an order to the prime minister!

When Did Pollution Appear?

The danger of pollution in the Sfax began with the establishment of the NPK Company in the heart of the city nearly 10 years ago. This danger has greatly increased during the past 2 years.

Pollution in Sfax destroys not only people, but also nature. It kills plants, dries up the soil and threatens animal life. Pollution of the sea has reached such proportions recently that all the city beaches have become unfit for bathing and swimming, as we mentioned. Citizens have begun to advise anyone going to the beach to watch out for the tar which is brought to shore by the waves and sticks to various substances and trash. However, the danger is greater than this, for the substances and trash can be cleaned. The real danger at this moment is that man might put an end to life in the depths of the sea. Some experts think that 1 ton of petroleum in its various forms can pollute more than 30 hectares of water. The presence of petroleum and its derivatives on the surface of the water prevents the renewal of oxygen in the sea and its dissipation in the sun's rays. Thus the small grasses and animals upon which fish feed are killed, and consequently, the fish themselves are killed. Thus it appears that the production of the resources of the sea has declined, and fish are suffocating, especially the al-sibaris al-zurub which we mentioned earlier.

Aside from the gas emissions of factory smokestacks and automobiles, which are laden with phosphoric and nitrogenous matter poisoning the air, there is also the danger of plastics which, when left to disintegrate, pollute the soil with several strong acids. By way of example, we mention the area which extends from the beginning of the Qabs road to kilometer 10 where the soil is arid.

In connection with the pollution of grains, green crops, grasses and dairy products, the inhabitants of this area, including both farm laborers and owners, complained to the regional authorities. Doctors whom we contacted all confirmed that residue from the stack emissions of these companies and factories is 100 times greater than the normal level in the human body and is therefore poisoning people's blood. The inevitable result of this pollution is that citizens suffer from serious diseases such as cancer and emphysema. The incidence of bronchial disease has increased more than 50 percent recently. If the onward march of this pollution is not stopped soon, citizens will continue to be threatened with deadly diseases.

The citizens of Sfax are trembling with fear, and pollution is a source of alarm to them. They demand that a solution be found.

7811
CSO: 5000

CEMENT PLANT TO HAVE DUST EMISSION CONTROL

Johannesburg FINANCIAL GAZETTE in English 28 Sep 78 p 3

[Text]

CEMENT Services (Pty), the projects engineering arm of Pretoria Portland Cement, has placed an order for gas-cleaning equipment worth more than R1m with Brandt Engineering, on behalf of PPC group member, Northern Lime.

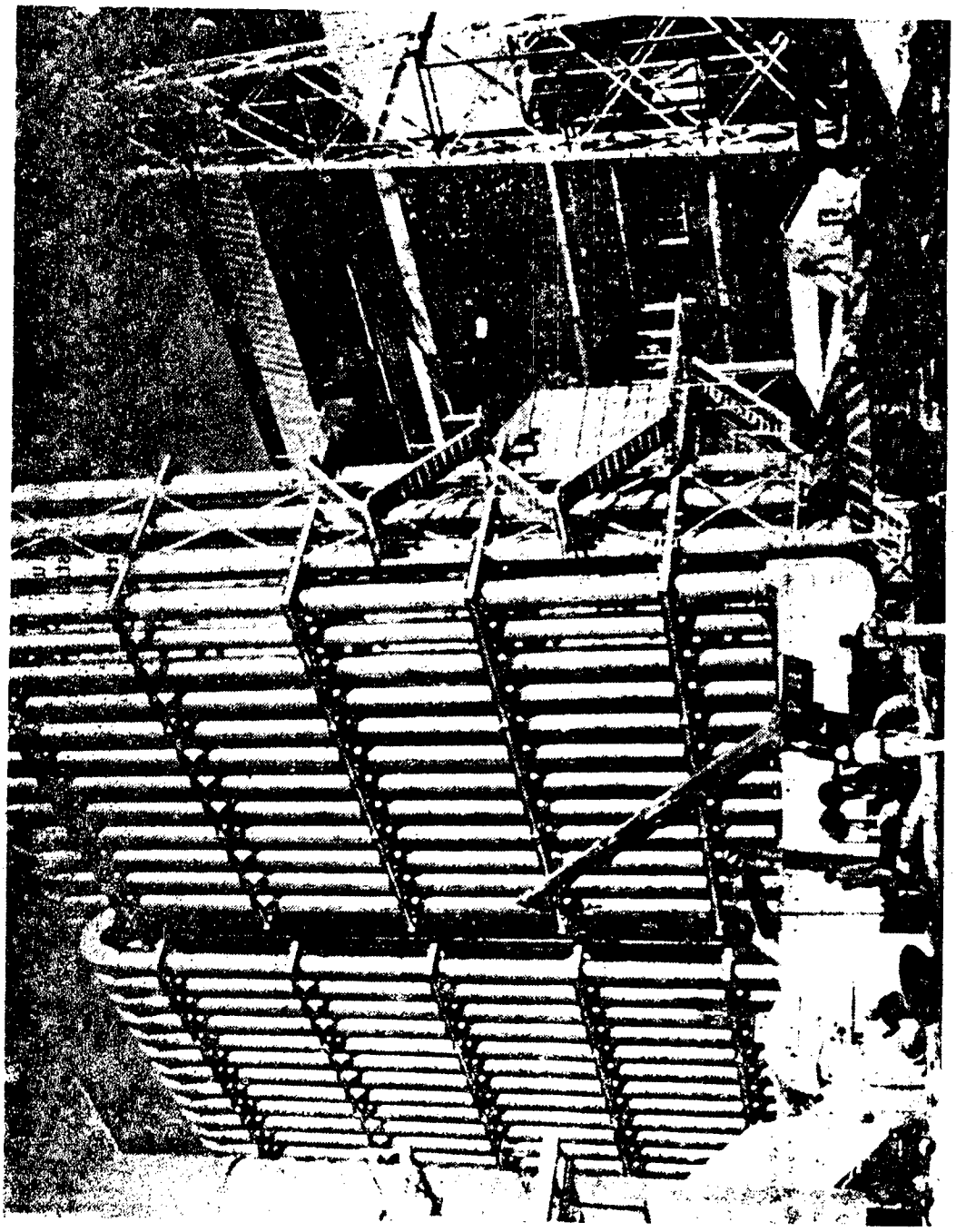
The equipment will control dust emission from the exhaust gas stack of No. 7 rotary lime kiln at present under construction at the Lime Acres works of Northern Lime, some 160 km west of Kimberley.

The electrostatic precipitator will incorporate about 97% local content and is designed for a dust collecting efficiency of 99,68%; this means that almost 50 000 tons of dust will be collected each year, when the kiln is operating at full load, and an air pollution problem will be avoided.

The contract at the 1 000 tons/day lime kiln is for the design, supply, erection and commissioning of the fume extraction plant consisting of ducting, trombone cooler, precipitator, chimney stack and dust handling equipment.

The plant should be in operation early in August 1979

[Photo on next page]



CSO: 5000

SEWAGE TREATMENT PLANTS FOR 29 CITIES

Moscow EKONOMICHESKAYA GAZETA in Russian No 39, Sep 78 p 17

[Article by K. Sharonov, chief of the Main Administration for Interrepublic Supply of Livestock Breeding Equipment [Soyuzglavzhivotnovodkomplekt] of the USSR State Committee for Supply [Gossnab]: "Cities and Water"]

[Text] It would be difficult to list all, even the major cities, where construction of powerful sewage treatment plants is under way.

Since the time six years ago when Soyuzglavzhivotnovodkomplekt was entrusted with fulfilling orders for equipment, instruments, cable and other articles used in constructing sewage treatment plants much has been done. For the years 1972-77 sewage treatment plants have been installed and put into operation having an overall capacity of more than six million cubic meters of sewage water daily (using biological and mechanical purification) in 35 cities, including Leningrad, Volgograd, Kiev, Kuybyshev, Minsk, Gor'kiy and others.

In addition, 575 km of sewage conduits and 78 pumping stations began operations. This year sewage treatment plants must be built in 29 cities. Their overall capacity will amount to almost 3.3 million cubic meters of effluents daily. In all we are providing equipment to construct sewage treatment plants in 140 cities.

At the same time we must recognize that the pace in the construction of sewage treatment plants in the cities is still too slow. What is the cause? First, for a number of years the state planning committees of the union republics, in planning construction of sewage treatment facilities in cities, have not allocated sufficient funds for capital investments in the cities. For example, in the RSFSR, where sewage treatment plants are being built in more than 70 cities, the average allocation is hardly more than 12 percent of the estimated costs of the projects. Thus, construction requires more than eight years at a time when standards of the USSR State Committee for Construction call for a construction period of three years on similar projects.

Such is the case in other republics. In the Ukraine, for example, the estimated cost for this year for component parts of sewage treatment plants is

226 million rubles of capital investments and 39 million have been allocated, that is, the financing of construction is being stretched over approximately six years.

Analysis of construction title lists presented by the RSFSR State Planning Committee indicate that with the growth in the number of sewage treatment plants being built and their estimated costs, annual capital investment remains at its previous level and even decreases. Is it necessary to say that this leads to construction delays, scattering of funds and an increase in unfinished production.

In many instances tardy introduction of sewage treatment plants has been caused by unsatisfactory supervision of the construction and installation work. Year after year there are shortcomings in dealing with the plans of the USSR Ministry of Construction, the USSR Ministry of the Building Materials Industry, the USSR Ministry of Construction of Heavy Industry Establishments, the Leningrad engineering construction organization Leningradinzhstroy, and the Moscow Oblast Construction Trust. Only 86 percent of the work was completed last year in the RSFSR.

The construction of sewage treatment plants is going very slowly in Ivanovo, Engels, Kursk and Shchelkovo. The local construction workers have an insurmountable ceiling at 50-70 percent of the program. On the whole throughout the republic just last year, through the fault of the construction workers in 14 cities including Ivanovo, Rybinsk, Yaroslavl', Kazan' and others, there was failure in supplying the necessary equipment and components for sewage treatment plants having an overall capacity of 2,115,000 cubic meters of water daily.

Soyuzglavzhivotnovodkomplekt is delivering equipment in dozens of cities and we are striving to see that our consumers receive it in full and on time. However still not always does the outfitting and equipping of construction projects take place as one might think.

An operational solution to technical questions associated with supplying all necessary components is complicated by the fact that capital construction departments [OKS] or main administrations of capital construction [GUKS] who, as a rule, are entrusted by oblast executive committees and municipal executive committees with the function of customers for the construction of sewage treatment plants at times have no qualified specialists for these structures. Experience shows that all questions on component supply are being resolved effectively and skillfully there where sections of the municipal economy administrations serve as the customers. They exercise better control over the construction process and its quality. Good experience in this regard has been gained by the Leningrad city executive committee which transferred the function of client from the GUKS to the administration for water supply and sewage systems. I think that this matter should be organized in this manner everywhere.

As before the question about production of specialized equipment for sewage treatment plants in cities remains acute. The enterprises of the Ministry of Chemical Machine Building can in no way organize production in the necessary amounts of mechanical aerators, scroll centrifuges, special sewage system pumps and other equipment. Special alarm is aroused by the lack of production of turboblowers without which biological purification of sewage water is not possible.

With raised sanitary standards in the purification of sewage water discarded into water resources, the planning institutes have begun planning pre-purification units as part of the sewage treatment plants. However, series production of updated micro-filters for mechanical purification and pre-purification of effluents (with a productivity of 1,000-2,000 cubic meters an hour) has still not been set up. Due to the lack of standardized equipment, plans call for individual pre-purification units. Naturally, there will be a need to use non-standard equipment, and its manufacture is quite difficult. I think it would be expedient to develop and approve a list of non-standard equipment for sewage treatment plants dependent upon a centralized supply of rolled iron.

In recent years serious attention has been given to improving purification technology, in particular, to the processing and utilization of sewage water residue. In several cities instead of sludge pits which cover large areas, mechanical dehydration units are being built. However, the use of such advanced technology on a large scale is difficult due to a shortage of special equipment--drum vacuum filters, centrifuges, residue drying devices with oncoming jet sprays.

In this matter of protection and the efficient use of water resources it is difficult to overestimate the role played by highly efficient sewage treatment plants. They reliably protect the rivers, lakes and seas from pollutants and contribute to the replenishment of the fish supply. We must intensify our concern for the construction of sewage treatment plants. We must take all measures to see that they are built on time and are of high quality.

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CSO: 5000

USSR

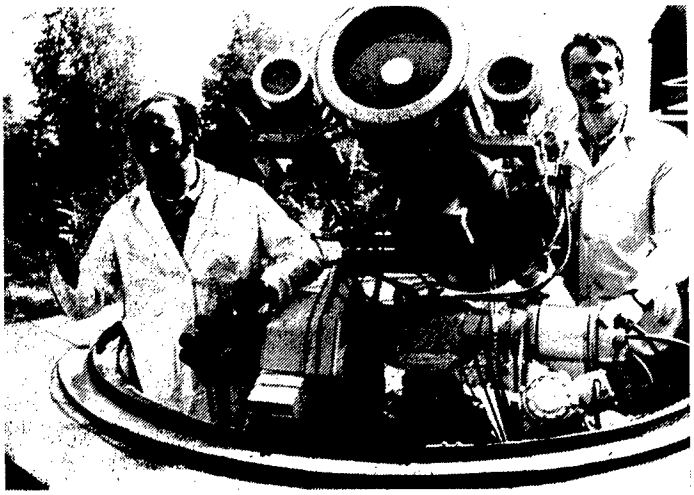
LASER MONITORS THE ATMOSPHERE

Riga SOVETSKAYA LATVIYA in Russian 3 August 78, p 4

[Article from pictorial review of TASS]

[Text] Scientists of the Institute of Atmospheric Optics of the Siberian Department of the USSR Academy of Sciences jointly with colleagues of the SKB [special design office] "Optika" of the Siberian Department of the USSR Academy of Sciences have created unique devices--laser locators to determine meteorological and optical parameters of the atmosphere.

The laser locator "Loza-3" makes it possible to measure the level of aerosol pollution on an area 10-15 kilometers.



The senior scientific colleague of the Institute of Atmospheric Optics, candidate of physicomathematical sciences B. Kaul' (on the left), and engineer of the SKB G. Uzhakov conduct atmospheric sounding with new laser locator "Loza-3"

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SCIENCE CENTER 'INTEGRAL' STUDIES POLLUTION

Moscow SOVETSKAYA ROSSIYA in Russian 9 Jun 78, p 2

[Article by V. Aleskovskiy, head of A. A. Zhdanov Leningrad State University, corresponding member of the USSR Academy of Sciences, and K. Kondrat'yev, corresponding member of the USSR Academy of Sciences: "Birth of "Integral"]

[Text] Among the numerous major problems associated with the rapid development of the scientific and technical revolution of great importance now is environmental protection and the rational use of natural resources. These problems, as a rule, have an interindustry nature and require for their solution the participation of many ministries and departments, and the involvement of large groups of scientists who are studying at the junctions of different scientific directions. But it is not so easy under the conditions of departmental subdivision to achieve the necessary integration of the scientific search, and to concentrate the efforts of specialists in the main direction. It is most realistic to do this in the higher school within whose walls hundreds of thousands of highly qualified specialists are working.

Recently a group of scientists of Leningrad University earnestly began to work out this urgent all-state problem.

At the scientific council the conclusion was drawn that the university should concentrate attention on the concept of socialist use of nature. This decision was based in the first place on the indication of Comrade L. I. Brezhnev in his speech at the October (1976) Plenum of the CPSU Central Committee that "there is now no task more urgent than pulling the agrarian sector of our economy up to the most modern level."

Work in the interests of the agroindustrial complex of the country has become for us pivotal in this respect. It was important to stimulate the development of the appropriate interdisciplinary studies. In this respect a joint decision of the RSFSR Minvuz, USSR Minvodkhoz, and the Goskhoz of the USSR Council of Ministers created the scientific center "Integral" of the Leningrad University. Its main organizational unit became the Special Design Bureau of Aerospace Apparatus.

The main directions of its activity were also defined. Here a small circle of main problems has been isolated, and previously accumulated experience is being successfully used. The university already for many years has been developing methods and apparatus to track the condition of the environment from space. The Leningrad instruments have been installed on tens of manned spacecraft and orbital stations. Here the primary attention of the specialists was focused on the problem of the further development of methods to study the environment and natural resources from space. The USSR Ministry of Land Reclamation and Water Resources that is interested in obtaining specific scientific recommendations rendered great support in this matter. It was decided to significantly expand the studies conducted. For these purposes in Moscow, Kiev and Minsk there own types of branches of our OKB [Special Design Bureau] have been created. They will participate in the solution of many urgent questions. And primarily the available space information should be identified with information for the same regions, but obtained directly by ground observations. This is why we need a single technique to determine the resources of the soil, fluctuations in the level of reservoirs, and degree of filtering through the wall of irrigating canals. It is no less important to make a detailed study of the water and wind erosion, to pinpoint the zones of swamps and swampy lands, underground waters, and so forth. In the past year in a number of regions of the Leningradskaya oblast and northwest USSR that are included in the nonchernozem zone a major comprehensive expedition was working.

The specialists of "Integral" have set the task of using the accumulated data to improve the efficiency of land reclamation measures. We recall that in the Tenth Five-Year Plan over 40 billion R were allocated for this work. The sum is enormous, and it is clear that each percent of increase in the efficiency in its use is turned over by hundreds of millions of R.

The national economy needs a further, at the same time significant expansion of land reclamation measures. Thus the acute deficiency of water in a number of southern regions produces the need to transfer part of the flow of the northern rivers of the European territory and Siberia to the south. This measure is of enormous scale. But its realization requires the thorough estimates of possible ecological consequences.

This also forced us to undertake developments in the field of ecological modeling and prediction. Of primary importance here are the economic aspects of the problem--solution of the tasks of economic efficiency of the land reclamation measures. It is not clear, for example, if it is always necessary to increase the volume of water transfer into the definite region? Is it not simpler to invest resources in improving the efficacy of the already available resources by optimizing the pattern of irrigation, eliminating losses due to filtering, and so forth.

Specialists in the department of applied mathematics and control processes in cooperation with their colleagues are developing a scheme for the optimal distribution of capital investments for the branches up to 1990. This is

the most complicated task. Its solution requires not only specific economic estimates, but also consideration, at the same time quantitative, of all possible ecological consequences. Leningrad University with dozens of its departments, scientific research institutes, design bureaus, laboratories, with the experimental plant, and experimental production basis represents a major scientific training association.

Numerous groups in the university are working in all the main regions of natural and social sciences. It is clear that such a large center of the higher school is capable of participating in any comprehensive scientific programs. Being one of the generators of new ideas it is obliged not only to bring them to the consciousness of the broad scientific community, but also to develop on their basis scientific research and developments that are necessary to accelerate the rates of technical progress, and to attract to participation in them other research, as well as production groups. "Integral" is also aimed at solving these interindustry tasks.

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ALL-UNION CONFERENCE ON PESTICIDES AND POLLUTION

Dushanbe KOMMUNIST TADZHIKISTANA in Russian 9 Sep 78 p 3

[Article by O. Sobolev: "A Scientific Approach to the Application of Pesticides."]

[Text] On 6-7 September in Dushanbe the First All-Union Symposium on Urgent Hygienic Problems in the Application of Pesticides and Biological Means to Combat Agricultural Pests under the Conditions in Central Asia and Kazakhstan took place. Its participants--scientists from Moscow and the fraternal union republics--listened to and discussed more than 40 reports which summarized data from scientific research carried out in recent years by hygienists, toxicologists, epidemoligists and specialists on the protection of vegetation.

The protection of nature and the health of man based on a solid scientific approach to suing chemical means to protect plant life is one of the important tasks resulting from the decisions of the 25th CPSU Congress of the July (1978) Plenum of the CC CPSU. Chemicalization, as the plenum underscored, remains one of the important factors in the further intensification of agricultural production. Therefore, it is important to render aid to the practices in the development and accurate fulfillment of agrochemical principles for using the various preparations.

For a number of years already research has been carried out successfully in the field of hygiene and in the normalization of pesticide application, in the study of their influence on man's health, and in the development of biological measures to combat agricultural pests. The symposium made note of the major contributions in solving these problems made by the Tadzhik Scientific Research Institute for Epidemiology and Hygiene; the Institute of Zoology and Parasitology of the Tadzhikistan Academy of Sciences; the Tashkent and Dushanbe Medical institutes; and the Scientific Research Institute for Sanitation, Hygiene and Occupational Diseases (Tashkent). Positive results are coming about from the close contacts between these institutes with institutions of the ministries of agriculture that are working in the field of the protection of plant life and with institutes involved in farming, gardening and viniculture.

Forum participants heard reports from Tadzhik scientists on results for a systematic study of agricultural sources of chemical pollution to the environment, on measures being developed for the hygienic selection of pesticides and their safe use under conditions of high summer temperatures, and on the integrated method developed here to combat agricultural pests and diseases.

The symposium developed recommendations aimed to further deepen scientific research in a given field and worked out methods for the coordination of work of corresponding research institutions in Central Asia and Kazakhstan.

The results of the symposium were summarized by academician of the USSR Academy of Medical Sciences, director of the All-Union Scientific Research Institute for Hygiene and the Toxicology of Pesticides, Polymers and Plastics, L. I. Medved'. He underscored the prime importance of a forum for further development of scientific work in the field of hygiene and the toxicology of pesticides being used in our country's agriculture.

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KRASNODARSKIY KRAY EARTHQUAKE

Moscow TRUD in Russian 5 Sep 78 p 4

[Article by L. Kramarenko and G. Klyucherov: "Epicenter in the Black Sea"]

[Text] On 3 September at 3:21 and 16 seconds an earthquake was registered in the Krasnodarskiy Kray. According to data from the Severo-Kavkazskaya Seismic Observatory of the USSR Academy of Sciences, the earthquake's center was located in the sea close to the resort towns of Dzhugba and Arkhipo-Osipovka. On the shore close to the epicenter the force of the underground shock reached five-six and four in Krasnodar and Sochi on the international 12-point scale. No damage was noted.

...As Saturday was becoming Sunday the night was quiet and starry over the village of Arkhipo-Osipovka. Suddenly a rumble was heard. At first it came as if it were from afar and was gentle. Then it drew nearer and turned into a continuous drone. And then a roar resounded. There was a sensation as if there was the crash of thunder of unusual force. People were naturally asleep. It seemed as if someone with enormous strength was moving their beds and sofas, jolting cabinets and small desks, and shaking chandeliers. Those, who went to their windows, noted five-story buildings rocking.

Fortunately, the earthquake was of short duration. The tremors were not continuous nor clearly defined. Soon all activity ceased.

And by the next morning it was clear that this large village was the closest of all to the epicenter where underground forces created an uproar. Specialists later explained that the force of the seismic center was approximately the same as that of the earthquake that took place in Tashkent. No damage occurred. On this occasion the underground natural elements raged at a depth of 30 km beneath the earth's surface, while in Uzbekistan the center of the earthquake was at a depth of 8 km.

Presently the epicenter of the earthquake was under the sea's botton, approximately 50-60 km from the shore. No powerful waves or water currents pounded the shore.

We spoke with the secretary of the village council of Arkhipo-Osipovka in the Gelendzhikskiy Rayon, M. Kukushkina and asked if she might tell us about what happened.

"The tremors caused no physical damage to our inhabitants," she said. "It's true that several chimneys collapsed and cracks appeared in apartment houses. Not a single building, even the oldest and most unstable, fell down. All utilities--gas, light, water and telephone--remained operable."

The greatest damage caused by the earthquake was in the resort town of Dzhankhot (Gelendzhikskiy Rayon), although not everywhere, and in the region of the left bank of the Khotsetay River. Actually even here not a single building came crashing down and not a single person was injured. But those vacationing at the Dzhankhot hotel were forced to leave three of the buildings because these structures had large cracks and were in need of repair. The chairman of the Gelendzhikskiy city council, N. Satarov, informed us that all damage was being dealt with.

The earthquake was felt by all resort areas situated on the Black Sea shoreline of the Krasnodarskiy Kray. Depending upon the epicenter which registered four to five points, no damage or harm was done to structures or people. In Sochi, situated at a distance far from Arkhipo-Osipovka the force was slight and many people took no notice of the small earth tremors. The inhabitants of Krasnodar felt the earthquake more intensely because they were just 100-110 km from the center of the earthquake's focus. But there was no serious damage here. In the kray center, as in all cities and inhabited areas of the Kuban', life and work go on at a normal pace.

A senior scientific coworker of the Severo-Kavkazskaya Seismic Observatory of the USSR Academy of Sciences, candidate of physics and mathematics, M. Zarayskiy, said that there was nothing sensational in the fact that an earthquake took place in the kray. A seismic zone extends along the entire coast line. In conjunction with this there is the Caucusus mountain system--a young one in which mountains are forming. Therefore, tectonic forces are actively operating in this region. For example, the last time there was an earthquake in Sochi was in 1970. Now the scientists and specialists are processing the material and more precise data will become known later.

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LAKE ISSYK-KUL' POLLUTION CONTROL

Frunze SOVETSKAYA KIRGIZIYA in Russian 2 Jul 78, p 3

[Article by K. Karakeyev, president of the Kirgiz SSR Academy of Sciences, corresponding member of the USSR Academy of Sciences; N. Adyshev, academician of the Kirgiz SSR Academy of Sciences; G. Yar-Mukhamedov, head of the Kirgiz SSR Administration of Hydrometeorological Service; N. Obukhov, deputy minister of Land Reclamation and Water Resources of the Kirgiz SSR; M. Bol'shakov, and P. Grigorenko, corresponding members of the Kirgiz SSR Academy of Sciences; and M. Kaplinskiy, head of the Department of Land Reclamation of the VNPO "Soyuzvodavtomatika": "How to Help the Lake"]

[Text] The basin of Lake Issyk-Kul' is located in the northeast section of Kirgizia, is distinguished by a fairly mild climate, and is one of the most picturesque corners not only of Kirgizia, but also of the Soviet Union.

The lake which is unique in beauty and in area (6,200 km^2) and which occupies about one-third of the entire area of the hollow promotes the leveling of fluctuations in temperature and air humidity. The rare advantageous combination of sea and mountain landscapes have already attracted here hundreds of thousands of recreationers and tourists. Issyk-Kul' belongs to the all-union health resorts. The basin of the lake has been declared a state preserve.

The mountains that surround the lake are rich in minerals and outflows of healing mineral waters.

Currently the population of the Issyk-Kul'skaya oblast is 380,000 people, and the forecast for 1990 expects 560,000. The total number of recreationers in the sanatoriums, holiday , and tourist camps for 1990 is expected to be 1.5 million people.

The basin has 1.6086 million hectares of agricultural lands. Currently for the needs of agriculture and water supply 25-30 cubic meters of water are taken per second, and in the future about 50 will be required.

Certain people propose stopping the development of irrigation in the Issyk-Kul' hollow. But it goes without saying that it is impossible to do this. The

continuous growth of the population requires a drastic increase in the productivity of the extant lands, and to expand even more the irrigated areas. Another question also arises--is it possible to reconcile oneself to the drop in the lake's level, taking into consideration the cyclicity of the climate factors, the exchange of low water cycles for high water, which will reduce the rate of drop in level. However the studies of a number of Soviet and foreign scientists indicate that the total increase in aridity and the continental nature of the climate that began at the end of the 19th century will continue at least until the year 2200.

Fairly conservative hydrological predictions indicate that by the year 2000 one should expect a further drop in the level by 1.5-3 meters. Such a reduction in the level will entail a number of unpleasant consequences and significant losses. The retreat of water from the shores will have a negative effect on fishing, navigation (the mooring lines will be on dry land or shoals), pier facilities, health resort beaches, hydrogeological and soil-forming processes of the coastal zone, and so forth. Thus all the currently extant excellent natural therapeutic beaches of the first and second categories (Choktal, Dolinka, Cholpon-Ata, Bosteri, Komsomol, Sukhoy Khrebet, Kara-Bulun, Tossor, Ton, and others) will be lost, since the shoreline will retreat from them by 500-1,000 meters. More than 2 million tons of therapeutic mud will be condemned to death. According to the approximate calculation of the expert commission of the Kirgiz SSR Gosplan the total losses for 1976-2000 are estimated as an imposing sum exceeding 350 million R. Not all the losses can be estimated. As is known Lake Issyk-Kul' lies on the path of the migration of numerous species of birds from Siberia to India and other countries of South Asia. For them the coastal band with its swampy water lands is a refuge. Finally the ring of thickets of sea buckthorn and other valuable plants will die which back in the 1930's occupied the band around the lake up to 3-4 km wide. A change in the ecological conditions of the band near the lake will entail negative consequences which cannot be estimated in a monetary expression.

In order to transform Issyk-Kul' into an all-union health resort it is necessary to preserve the ecological condition of the basin, and further develop agriculture to provide the continually growing population and flow of recreationers and tourists with food products. It is necessary to transform the plain zone around Issyk-Kul' into a blossoming oasis, abounding not only in the normal agricultural crops, but also in different arboreal and bush plantings, including ornamental. In the rest areas and around the populated points it remains to create shady blocks, groves, avenues, etc. Without the development of irrigation the large areas of the Issyk-Kul' hollow will remain lifeless, sultry, and rocky desert sections. An attentive analysis of all of these circumstances and the forecasting balance calculations made lead a number of prominent scientists of the Soviet Union and Kirgizia and the expert commission of the Kirgiz SSR Gosplan to a conclusion on the urgent need to stabilize the current level of Lake Issyk-Kul'.

"Kirgizgiprovodkhoz" has examined several variants to the solution to this problem, of which in the near future two can be realized. It is expedient

to transfer part of the flow of the river Kar-Kara (basin of the river Ili) in a volume of about 300 million cubic meters. Losses in the basin of the river Ili will be only about 2.5%. Here it is necessary to build a dam and a canal. The cost of construction is about 12 million R. The second project--to transfer the flow of the river Arabel'su (basin of the river Malyy Naryn) into the river Dzhouku (basin of Issyk-Kul') in a volume of about 120 million cubic meters. The losses of flow for the lower stream of the Naryn will be only about 1%. The cost of the work--about 3 million R. The fulfillment of these projects will solve the task of stabilizing the water level in the lake for the next 20-30 years.

In the more distant future it is proposed to realize other much more complicated and expensive variants which make it possible not only to solve the task of stabilizing the water level in the lake, but also the complex problems of developing hydraulic power, irrigation of the lands of Kirgizia and Kazakhstan in the Chuyskiy hollow, and other problems. Of them the variant of transferring up to half of the flow of the river Sary-Dzhaz (basin of the river Terim) and the river Turgen'-Aksu (basin of Issyk-Kul') in a volume of 2 cubic kilometers for comprehensive use should be considered the most advantageous. Here it remains to build two reservoirs, two tunnels 34 and 14 km long, a number of hydraulic engineering structures, and a hydroelectric station. This variant in a radical manner solves the task of stabilizing the level of the lake, but requires extensive searches and studies, and a large volume of major work in difficult to reach high-mountain conditions. Therefore the most real currently are inexpensive and fairly simple projects to transfer part of the flow of the rivers Kar-Kara and Arabel'su.

The problems of Issyk-Kul' are complicated, and require a serious and deep approach, and considerable scientific studies. In relation to this the proposal of V. Bukin in the article "Why Issyk-Kul' is Growing Shallow" (SOVETSKAYA KIRGIZIYA, No 137, 14 June 1978) seems to us simplified and deviating from a serious solution to the problem upon which many scientific research and planning organizations are laboring. The problem will be solved in accordance with the directives of the 25th CPSU Congress and the tasks for transforming Issyk-Kul' into an all-union health resort and the largest agricultural region in the republic.

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POLLUTION CONTROL MEASURES IN AZERBAYDZHAN

Baku BAKINSKIY RABOCHIY in Russian 1 Aug 78, p 1

[Article: "Nature, the State and the Citizen"]

[Text] The scientific and technical revolution with its rapidly increasing effect on the environment, the dynamic development of the national economy, and the growth of material and spiritual needs of the Soviet people have made environmental protection, the rational use and reproduction of natural resources one of the most important all-state tasks. The fulfillment of plans for economic and social development of the country depends on its successful solution.

"To use nature as differently as possible," stated the General Secretary of the Central Committee, Comrade L. I. Brezhnev in the Fiscal Report of the CPSU Central Committee to the 25th Congress. "One can--and the history of mankind knows many examples for this--leave behind oneself barren and lifeless spaces hostile to man. But one can and should, comrades, enrich nature, and help nature to more fully reveal its vital forces. There is such a simple expression known to all "blossoming kray." This is the name for lands where knowledge, experience of people, their affection and their love for nature truly work wonders. This is our socialist path."

The Central Committee of the Azerbaydzhan Communist Party and the government of the republic are focusing daily attention on the problems of the environment, and are supervising the implementation of a series of major environmental protection measures. New evidence for the concern of the state for man's environment was the eighth session of the Azerbaydzhan SSR Supreme Soviet of the Ninth Convocation which took place the other day. It examined the question "the condition and measures for further improvement in environmental protection in the Azerbaydzhan SSR in light of the tasks set by the 25th CPSU Congress." In the documents of the session a detailed analysis is given for the work done, deficiencies are revealed, and specific tasks are defined for the next years.

In the Tenth Five-Year Plan for environmental protection in the republic it is planned to spend over 160 million R--almost double than in the Ninth.

Considerable resources have been allocated to refresh the air basin, especially in industrial cities, today at the enterprises there are 2,900 gas-purifying and dust-collecting units. But many of them operate inefficiently, and about one-third are inoperative.

Due to the extensively developed construction in Azerbaydzhan of water treatment facilities, systems of circulating water supply, the introduction of waste-free technological processes, the discharge of polluted industrial and domestic sewage into the coastal zones of the Caspian and other reservoirs has been reduced. But the necessary cleanliness of the sea has not yet been guaranteed. Thus there are no bases for calm. The volume of today's and the future work is too great, and there is too little time remaining until 1985 when the discharge of untreated waters into the basin of the Caspian must be completely stopped according to the decision of the USSR government.

The service for protection of agricultural crops from hail damage is successfully operating. This year it alertly has saved 737,000 hectares of fields and orchards. Its efficiency is indicated by the fact that in the first six months less than one-tenth percent of the protected area suffered from hail.

A remarkable contribution of the public in the creation of new orchards and parks, and improvement in the landscape and climate is the participation of the residents of Baku in the landscaping of the capital of Azerbaydzhan. Mass subbotniks and Voskresniks have helped to refresh the air which the 1.5 million people in the city breathe, since during the last seven years the area of green plantings has increased 2.3-fold, and today each citizen of Baku has about 50 square meters.

Concern for the land, its welfare, and improvement of its fertility--were the main directions of environmental protection. On the plains of Azerbaydzhan extensive work is being systematically conducted for melioration of the saline areas, and increase in the irrigated areas. Much less attention is being focused on the mountain and foothill regions, where hundreds of thousands of hectares of sloped lands are subject to the destructive effect of erosion, are often incorrectly used, and therefore produce low yields. For anti-erosion measures insignificant resources are allocated, but they are also poorly developed. With a scientific substantiated development of the sloped lands they will become an important reserve for improving the productivity of plant growing and animal husbandry, and will help the republic fulfill the decree of the July (1978) Plenum of the CPSU Central Committee "on the further development of agriculture in the USSR."

The highest organ of state power of the Azerbaydzhan SSR has adopted a decree that contains a broad program of work. The Supreme Soviet has expressed the conviction that the ministries and departments, soviets of people's deputies, economic and social organizations, enterprises, kolkhozes and sovkhozes, scientific institutions, and all the workers in the republic under the leadership of the party organizations with honor will fulfill the tasks set by the 25th CPSU Congress for the further improvement in environmental protection, the efficient use and reproduction of its resources for an accelerated and

comprehensive development of industry and agriculture, and to create the favorable conditions for the life, health, work and rest of the workers.

The new constitutions of the USSR and our republic also oblige this. In the Soviet Union, in the developed socialist society the state and citizen implement environmental protection. The state--with its legislative and executive power, colossal economic and scientific potential. The citizen--with his love for his native nature, active living position--man who himself is a particle of nature.

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POLLUTION BY OIL PRODUCTS

Moscow VODNYY TRANSPORT in Russian 13 Jul 78, p 2

[Article by L. Klyava: "For the Cleanliness of the Sea"]

[Text] The cleanliness of the environment is a truly national concern. This is also stated in the USSR Constitution that obliges all Soviet people to have a prudent attitude toward nature, and to think of how we will leave the earth for the future generations. The post of people's control that operates on the tanker "Tukums" of the Latvian marine steamship company has conducted, for example, a raid whose purpose was to establish how measures are implemented on the ship that are necessary to prevent pollution of the environment, and in the first place of sea water. The patrols established that all the novices that come to the tanker pass instruction during which they become familiar with the standard documents on the rules of preventing pollution of the sea during anchorage, when the diesel boat is receiving or releasing liquid cargo.

A strict and efficient supervision has been set up in order not to permit the smallest leaks of oil products. The people's controllers themselves certified during the inspection that the drainholes of the cargo deck are at the moment of filling and draining of oil products tightly plugged up by wedges and cemented. The lookout service conducts a constant and demanding analysis of the fuel consumption in the boiler unit, and watches that there is not an intensive discharge of smoke into the atmosphere not only during anchorage at port, but also during the course of the ship at sea. Food wastes are collected in containers especially made for this purpose.

The maritime post of people's control noted not only the positive experience, but also uncovered certain deficiencies that require the interference of the port powers. Thus, the patrols established that in the Klaypeda port on the territory of the oil section the moorages do not have containers for food wastes and garbage. The participants of the raids notified the administration of the ship of certain omissions on the diesel boat itself.

"Let the sea be clean"--the people's controllers of the tanker "Tukums" are firmly armed with this motto.

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SOCHI BACK TO NORMAL FOLLOWING FLOODS

Moscow TRUD in Russian 16 Sep 78 p 4 LD

/Report by L. Kramarenko: "Sochi Floods"/

/Text/ Last Sunday Sochi was lashed by continuous heavy rainfall from early morning. There were strong gusts of wind.

Three gigantic water spouts suddenly formed in the sea one after another. Carrying many thousands of tons of water, they traveled along the Sochi, Matsetsa and Bzugu river valleys as far as their upper reaches where, losing force, they released their water with a crash. A heavy wave of water rushed down from the mountains with the speed of an express train.

Literally just a few minutes later there was an abrupt rise in the level of the river Sochi, which passes through the resort. It reached its highest point of 4.27 meters by noon. The water level exceeded by 1.47 meters the highest mark on the riverbank parapet fortification. The water, gushing over the parapet and smashing everything in its path, swept along streets in the city's Tsentralnyy and Khostinskiy rayons. Debris from old bridges, trees, bushes and various objects were carried along by the current. The surfaces of Roz, Sovetskaya, Naberezhnaya, Vorovskaya, Gagarin and other streets were covered by water 1 meter deep. The rushing, turbid water burst into basements and doorways of buildings. The city's electricity and telephones were temporarily cut off.

The water level in the river subsided within just 2 hours.

The inhabitants of Sochi and various city services set about bringing things back to normal without waiting for the flood to completely abate.

The lower stories and basements of many buildings were damaged as a result of the floods. The rainwater drainage system was blocked, and public gardens and streets were made impassable by mud flows. It is only thanks to the decisive and prompt action that was taken that it was possible to reduce the extent of the damage to the city economy and also to avert casualties among the population.

Today Sochi has been almost fully brought back to normal, true, in some places particularly affected by the floods, repair and cleaning work is still in progress, but that is not having any effect on the work routine in the city.

CSO: 5000

BRIEFS

EARTHQUAKE IN KIRGIZIA, UZBEKISTAN--Tashkent, October 9, TASS--An earthquake took place at 17 hours 20 minutes of Moscow time on October 8 in the territory of Kirgizia and Uzbekistan. Its force in Osh /Kirgiz SSR/ was 5-6, in Ferganah, Tashkent and Andizhan /Uzbek SSR/--four at the 12 point scale. The epicentre of the earthquake was in the area of the Soviet-Chinese border in the eastern part of the Altay ridge. There were no casualties or destructions. /Text/ /Moscow TASS in English 1130 GMT 9 Oct 78 LD/

EARTHQUAKE, TREMORS HIT KISHINEV--Kishinev--An earthquake took place in Moldavia on 2 October at 23 hours 29 minutes Moscow time. In Kishinev, the capital of the republic, tremors were felt; the force of the tremors was four, measured according to a 12-point scale. In the republic's southern regions, the force of the tremors was four and a half points. The duration of the underground vibrations /Kolebaniya/ did not exceed 30 seconds. As a TASS correspondent was told by Anatoliy Drumya, director of the Geophysics and Geology Institute of the Moldavian Academy of Sciences, the epicenter of the earthquake was situated 235 kilometers from Kishinev, near the town of Focsani in Romania. There is no destruction and are no victims in Moldavia. /Text/ /Moscow TASS International Service in Russian 1045 GMT 3 Oct 78 LD/

ANTIPOLLUTION BOOM BARRIER--A boom barrier was turned over today to a state commission in the port of the tanker fleet of the Primorskoye Steamship Line. This is the first such technical structure in the system of the USSR Ministry of the Maritime Fleet and is designed to protect the bay's water area from pollution by petroleum products. [Text] [Vladivostok Domestic Service in Russian 0935 GMT 20 Sep 78 OW]

CSO: 5000

BALTIC, 'WORLD'S' DIRTIEST SEA' IMPROVING WITH CLEANUP DRIVE

Helsinki HELSINGIN SANOMAT in Finnish 17 Sep 78 p 28

[Article by Mikko Eronen: "Baltic Sea Protection Agreement Begins To Produce Results; World's Dirty Sea Washes Its Face"]

[Text] The Baltic Sea is gradually improving its reputation. As late as the beginning of this decade it was still actually termed officially as the world's most polluted sea.

Now that the Baltic Sea Protection Agreement has been in effect for about 4 years, partial alleviation of the situation can already be noted and control of the deterioration is gaining ground.

About 140 million people live in the coastal countries of the Baltic Sea. Industrial establishments have become grouped in the deltas of 60 rivers that drain into it. About 70,000 merchant vessels annually ply the Baltic Sea.

The Baltic Sea has unfortunately acquired seven industrial states on its coasts, all of which enjoy a high standard of living, which results in a high outflow of toxicants and wastes.

Small wonder then that only about 5 years ago the Baltic Sea was generally referred to as a sewer and dirt sea. The Baltic is still being excessively loaded with wastes, poisons, and oils, and by changing the ocean environment by altering the bottom, the shores, and the rivers.

Nonetheless, a change toward a cleaner Baltic Sea has begun. The control of toxic pollution is increasing, public awareness is improving, and a Baltic Sea protection agreement, the so-called "Helsinki Agreement," has come into being.

About 5 years ago, when the protection agreement was in preparation, the deterioration was at an alarming stage in certain areas, but already partial improvement can be noted, although all of the countries have not yet even ratified the agreement.

The Baltic Sea is so notorious for its poisons and filth that the FAO, the agriculture and food organization of the United Nations, early this decade designated it as the most polluted sea in the world.

The Baltic Sea has become famous for its poisons because they have been under study for a long time. The long-term investigations have been possible because of the long-term retention and enrichment of the poisons in Baltic waters where the exchange of water is very slow and occurs sporadically.

At the beginning of this decade, when preparations were opened for the Baltic Sea protection agreement, many parts of the Baltic were like sewers. Human, agricultural and industrial wastes and poisons oozed, or drained into it like roaring waterfalls, completely untreated.

The deterioration of the sea had been noted already before that, but treatment measures were local, without any coordination.

In 1974 the Ocean Research Council and the Ocean Research Scientific Committee undertook a study, the results of which produced the following brief picture of the Baltic Sea:

The heavy metals level of the open seas approximate those of the natural state. The cadmium and mercury levels in the coastal areas, particularly in the sourthern portions of the Baltic Sea, have clearly increased, and the heavy metals level is less than in the North Sea. The level of the chlorated carbohydrates (DDT and its derivatives and of PCB) is of the same magnitude as those in the North Sea, but several times higher than those, for example, in the interior waters of Finland.

Mercury Already Decreasing

The results of that study are several years old and already at present improvement can be noted in the toxicant situation. The amount of mercury in fish taken in the coastal areas is two thirds smaller than it was 10 years ago, and the amount of DDT has decreased after the ban on its use went into effect in the coastal countries.

But the level of PCB substances continue as black marks on the poison charts. The PCB level has not decreased despite the restrictions on its use.

About 30 to 40 tons of mercury are released into the Baltic Sea annually, mainly by rivers burdened with it by industry. About 200 tons of cadmium are released into the sea and about 5,400 tons of lead, mainly through the atmosphere as traffic exhaust gases.

The DDT flows mainly from agricultural areas, but the amount of it is not known. The PCB escapes into the Baltic Sea with industrial waste water and directly from the atmosphere. The quantities are not known.

Exceptionally high levels of environmental poisoning can be measured in the channels around Denmark and in the waters fronting Stockholm, Oulu, Pori, and Kotka.

Economic Recession Aids the Sea

During the first half of this decade the forest industry was still the major polluter, particularly in the areas of the sea that are under Finnish control, but the amounts of pollutants discharged by the sources have decreased to the point where they conform to the objectives of the environmental protection programs. However, the main reason for this is the diminishing of industrial production owing to the economic recession.

The damage caused by oil remains at the former level. During the past decade it was at the customary level, but it has since decreased in pace with the tightening of regulations. About 40 percent of the discharge is intentional, owing to oil tanker mishaps. About 300 discharges occur annually from Finnish and Swedish sources alone, and from 75 to 80 percent of these are intentional.

Oil does damage to flora and fauna through both mechanical and toxic effects. Oil destroys sea fowl and suffocates plant life, including the plankton, the most important factor in the eco system of the sea because other groups of organisms depend on the vegetative food mass they produce.

About 40,000 tons of oil trickle annually into the Baltic Sea. Large oil spills have been avoided. The oil comes mainly from small discharges in spite of the international prohibition against the spilling of oil into the Baltic Sea.

The Baltic Sea has for long been considered the worst oil polluted sea, where tens of thousands of birds are killed annually by oil. For instance, more than 100,000 long-tailed ducks have been killed in the past few decades.

The trend has been more favorable during recent years. For instance, the previous levels of mass destruction of birds have no longer been observed in the south Baltic Sea where oil spills were previously common.

The decrease in oil spillages has been influenced in particular by the decrease in oil shipping arising from the price increase, or oil crisis, the change in popular attitude toward favor of environmental protection, improved control, and the international agreements.

A system of oil spill damage control, the informational system of which is already completed, is in process of formation. The areas of oil damage elimination responsibility have not yet been determined. That has been slowed by the apportioning of the Baltic Sea into economic areas. The objective is that each country would be responsible for the protection of its own area at the same rate that it derives economic benefit from it.

The state of preparedness for the elimination of oil damage is, despite all assurances otherwise, still weak in the Baltic countries. The only country that has any degree of preparedness is Sweden, but even that country at this stage is unable to effectively move damage control equipment to areas where needed.

Familiar in every country is the situation following an oil spill, in which the authority in charge states what was learned from this experience and that the next time a similar occurrence takes place the elimination devices and the personnel will be in readiness. But the next time only a few hundred meters of under sized oil retention booms are available and a few volunteers with shovels stand at the shoreline.

Collaborative Organ Still Temporary

Ilppo Kangas is the motive force in the temporary Baltic Sea commission, in which he is for the time being the only official. The Baltic Sea commission is a coordinating organ that is responsible for all the activity agreed upon in the Baltic Sea Agreement, the so-called "Helsinki Agreement."

Kangas complains, "because the agreement has not yet been ratified by all the parties, it has not been possible to establish a permanent secretariat for the commission."

"The Eastern democracies have not yet ratified the agreement because they feel that their readiness for the environmental protection of the Baltic Sea and for the prevention of environmental accidents is not yet of the class that requires an agreement."

The Baltic Sea Protection Agreement was undersigned in 1974 by all of the coastal countries of the Baltic Sea: the Soviet Union, Poland, the DDR, the Federal Republic of Germany, Denmark, Sweden, and Finland.

Deterioration Soon to be Under Control

Kangas states that as of 1979 it will be 5 years since the agreement was signed and that already partial improvement can be noted in the degree of deterioration of the Baltic Sea.

Notable in the improvement of the situation is the fact also that this is the first time that the Baltic Sea coastal countries are jointly accumulating information about the pollution of the Baltic Sea and are undertaking the planning and building of facilities essential to the elimination of pollution and are formulating legislation that conforms to the requirements of protection and that is an uniform as possible in respect to each country.

The bans and restrictions on the use of certain toxicants have been in force for several years and their effect on the deterioration of the Baltic Sea have been favorable. The concentrations of toxicants have decreased in the Baltic Sea.

The deterioration is not a chance disturbance, for it has been continuous. "The proof of that is in the seals and the long-term poison damage they have suffered, for the seal is at the top of the nutritional chain," Kangas notes. And if the seals have suffered poison damage in recent years it means that the effect of the poisons at the lower end of the nutritional chain, started long ago.

"The DDT concentrations in the fish are still five to ten times higher than those of the fish in the North Sea."

An Historic Agreement

The Helsinki agreement is the first to cover all sources of pollution in that it takes into consideration pollution that comes from the land, the sea, and the air. All the other protection agreements cover only parts of areas and are so loosely drawn that loopholes can always be found in them.

Other sea protection agreements include the Paris agreement that covers the English Channel and the Bay of Biscay (includes pollution from land only), the Oslo agreement that includes only the fishing areas of the northeast Atlantic Ocean, the Mediterranean agreement, the London agreement (a general sea protection agreement that covers pollution from land), and the IMCO sea organization consultative agreement between governments (for pollution that comes from the sea). Pollution that comes from the sea generally means oil discharges from vessels and oil mishaps.

Kangas feels that the existence of such agreements is an indication that there exists the will and knowledge to seek results in the protection of the sea.

The Baltic Sea Commission recommends that the Baltic Sea countries install waste oil disposal facilities in their harbors before the Helsinki agreement goes into effect. Kangas admits, "waste disposal facilities already exist in all countries, but the worst situation is in Finland."

A surveillance system for the Baltic Sea clean-up is currently in the planning stage. "It will be observed by means of studies and a recommendation for the basic principles of the studies already exists. This year a joint surveillance program based on national programs is in use for the first time," states Kangas.

"A proper surveillance program for 1979 will be drafted on the basis of these studies. For instance, the division of labor in the surveillance will be agreed upon more precisely than it is at present."

Since the deterioration of the sea appears in many instances to have abated, hopefully, the observers and the scientists will have something favorable to report in the results of their surveillance.

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LAND RECLAMATION RECEIVING INCREASED INTEREST

Reykjavik MORGUNBLADID in Icelandic 19 Sep 78 pp 28-29

[Article by Agust H. Bjarnason]

[Text] Some time ago, Sveinn Runolfsson, the director of land reclamation, held a press conference and explained the activities of the government's Land Reclamation Institute. Whether the conference was held because of my recent discussions with Björn Sigurbjörnsson or whether it was a reguarly scheduled item, I will leave unsaid, but they were certainly fresh in people's minds. Many things that came to light at the conference are worthy of further attention. However, it would take too long to report on everything, and therefore I will only mention a few things.

Sveinn maintains that the government's Land Reclamation Institute is progressing in the struggle against erosion because annually more land (5,000 hectares) is reclaimed than is eroded (2,000 hectares). I doubt his assertion because of the simple fact that no one knows how extensive the erosion is. Unfortunately, this is not the main point; the point is that our land still continues to erode. The cultivation of eroded land, as in Haf north of Thjorsdalur, is of little avail in the struggle against erosion itself. If I understand Sveinn Runolfsson correctly, he thinks that it is enough to reclaim 1 hectare of eroded land for each hectare of natural growing land with thick soil that is blown into the sea. In fact, I have noted this kind of thinking before. This summer, I visited a farm in the north where they were tearing away some beautiful heather land with a bulldozer up to the road by the edge of the field. I asked the farmer, a prominent man in his district, whether he didn't resent seeing such beautiful land so badly treated, with no apparent need. "No, no, it's alright," said the farmer, "the road builders sow grass seed on it and spread artificial fertilizer." I have to admit that I was dumbfounded.

No one should read into my words that I am opposed to the cultivation of eroded land, if it is done in a sensible way. Björn Sigurbjörnsson agrees with me that "it is senseless to reclaim eroded land or any kind of land in Iceland with Festuca rubra from Denmark," but the director of land reclamation says that it is working out fine. We must give this some

thought. I tried to point out the danger involved in the unnecessary use of fertilizer and not least of all, how excessively expensive this cultivation is, among other things, due to the improper utilization of fertilizer when it is spread by airplane.

From Runolfsson's talk with newsmen, it is apparent that he reacts angrily to my criticism. This is the sort of issue that it is useless to quarrel about. The cost of fertilizer application will presumably come to light in the institute's financial report at the end of the year, and it will be interesting to see the breakdown. As far as the utilization of fertilizer is concerned, I relied on my own observations, among other things, measurements of the width of sections of land. When I investigated the matter further, it turned out that this has been investigated only to a small and very insufficient extent. There can be no doubt that this must be investigated thoroughly. We do not have sufficient knowledge concerning how much fertilizer it is most economical to apply. The size of chemical particles varies greatly, and their distribution is unknown, but it must be taken into account. Very little is known about the distribution of fertilizers from planes and almost nothing under varying conditions.

In order to point out more clearly what I am referring to, I will cite an example. I want to emphasize that I am not relying on any concrete measurements because none are available. Neither am I taking into account crosswinds, which blow the smallest particles far away. Now, if we assume that research has shown that plant life responds best to a 25 g/sq meter dose of fertilizer (the figure is a close approximation), and if we also assume that 95 percent of the fertilizer from the plane comes down on a 25-meter wide area (not far from the norm), most of the fertilizer falls under the middle of the plane and then spreads evenly out to the sides, as shown in the graph below (estimate).

The dark areas show where a sufficient amount falls (i.e. 20-30 g/sq meter). The area in between gets too much, which can, however, increase the growth a bit but can also be dangerous because it disturbs the balance of the species, aside from being merely wasteful. At the margins the amount of fertilizer is so small that it does not increase growth to any appreciable extent. The green strip that develops during the growing season is about 16-17 meters wide. In spite of very uneven distribution, the average amount is 25 g/sq meter.

In accordance with the above example, there is a 35 percent fertilizer waste, besides which the excess amount can weaken plant life because the growth of the grass is excessive (see below).

I hope that people do not regard this article as hostile to the Government Land Reclamation Institute. I am just pointing out that this task is too risky without prior research. The law does not stipulate that the Land

Reclamation Institute should take charge of scientific research, and this must be changed. Rather, it is the task of the Agricultural Research Institute (directed by Björn Sigurbjörnsson). Our readers are presumably aware of the controversies that have just arisen regarding the institute's research on grazing land tolerance. It will no doubt be interesting to follow them up, but I will not venture into these controversies at this point.

In these discussions I have mainly opposed the application of artificial fertilizer on land with plant growth, which disturbs the natural balance. The Land Reclamation Institute applies about 10 percent of the fertilizer on land with plant growth, either on sheep grazing land far away from or close to farms. We must take into account that the 1974 Land Reclamation Program emphasizes the increased application of fertilizer, especially on grazing land close to farms (called "pasture land enhancement"), the purpose being to "improve and increase the harvest."

In my previous articles I cited many examples that show how dangerous this policy is. I do not think that it is necessary to mention them again. Instead, I will offer the conclusions that I drew from the plant life observations that I made in Kelduhverfi last summer, so that everyone can see what it is that sheep owners call pasture land enhancement. The plant analyses involved a horizontal coverage determination using a method named after three botanists, Hult-Sernander-Du Rietz. In accordance with this method of measurement, each species within each area under observation is given a mark from one to five, depending on the horizontal coverage of the leaves and shoots.

The measurements were taken on the following: a) heather that has not been treated and where sheep have always grazed; b) grass-covered areas where the heather was killed in 1974 with a hormone drug and which have since been fertilized from the air.

This was thoroughly explained in TIMINN (8 September 1974). There it says that the grass harvest increases about 60-fold, or from 0.6 horseloads per hectare to 34.3 horseloads per hectare. The purpose of spraying the chemicals and applying the fertilizer is to increase grazing tolerance and the grazing value of the land. I do not know exactly how sheep are doing on this artificially-grown grass, except that the lambs weigh less than before, and the sheep were let out of the area once because they were so frail by late summer.

The area involved was a mound-covered tract or hill where the plant growth is dry. Close to it is a rather tall birch tree forest, and the land was definitely covered with forests before. The mound-covered area is very uneven, with large undulations. The measurements were taken

only on the undulations, not in the furrows between them. Conditions for growth are somewhat different there, but the difference between the two areas is almost the same as on top of the undulations. There is very little growth in the furrows because the undulations are very large and flat-topped. Both areas are covered with vegetation.

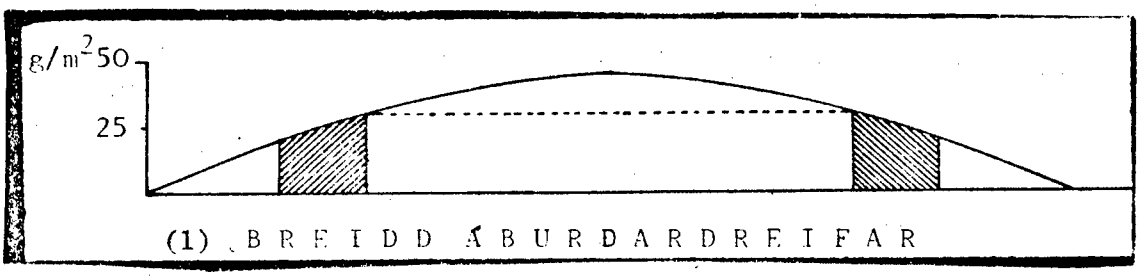
The table below shows our conclusions. Four samples were taken in each area, A in the heather and B in the sprayed and fertilized section of land. As they are no Icelandic names for mosses and lichens, the Latin names were used.

As we can see in Column A, many small shrubs predominate in the heather land, the most plentiful ones being Empetrum nigrum, Vaccinium uliginosum and Betula nana. Growing along with them are several typical species such as Vaccinium myrtillus, Salix phylicifolia, Carex bigelowi and Festuca rubra, which together are highly characteristic of the land. Other common species that we can mention are Calluna vulgaris, Thymus arcticus, Deschampsia flexuosa, Juniperus communis, Galium verum, Polygonum viviparum, Hierarcium and Luzula multiflora. Mosses and lichens are not, in fact, very abundant here and in many ways they remind one of the soil where birch shrubs grow and lava is found. In these four sample spots we found 28, 27, 26 and 25 species. The measurements reflect only a small sample of the lush growth found here. If there had been more, the variety would have been much greater.

Column B shows the same number of measurements on the area sprayed since 1974, where the same species as in Column A previously grew. Now there is only one species, Festuca rubra, that is abundant, as well as a few other species that respond to fertilizer. They are not widespread in the country and do not cover much of an area. Among these I can cite Galium verum, Galium pumilum, Deschampsia flexuosa and Cerastium alpinum. On the surface one can still see varities of heather such as Vaccinium uliginosum, Calluna vulgaris and Empetrum nigrum, but they are nearer dead than alive, the goal being to get rid of them. There are remnants of the mosses and lichens that existed before. The species taken at the observation points numbered 14, 13, 8 and 10, or about half as many as in the heather. The main thing is perhaps not the number of species but rather that where there were previously several species (under the shelter of which many others thrived), only one species is abundant now, along with a few struggling varities, and many have disappeared completely, at least for the time being, such as Betula nana, Vaccinium myrtillus, Geranium silvaticum, Poa glauca and Salix phylicifolia. Hopefully, most of them will come back when the land is not fertilied or used for grazing anymore. It should be quite clear to everyone that this artificially grown land is in no way as resistant to external environmental factors as the heather. Likewise, simple common sense indicates that these few species in the grass-covered land do not utilize all potential growing time during the summer in the same way as the many varieties of heather, not even in an average year and least of all if there are any major swings in the weather. Thus, I have said previously that they are shortening the growing time.

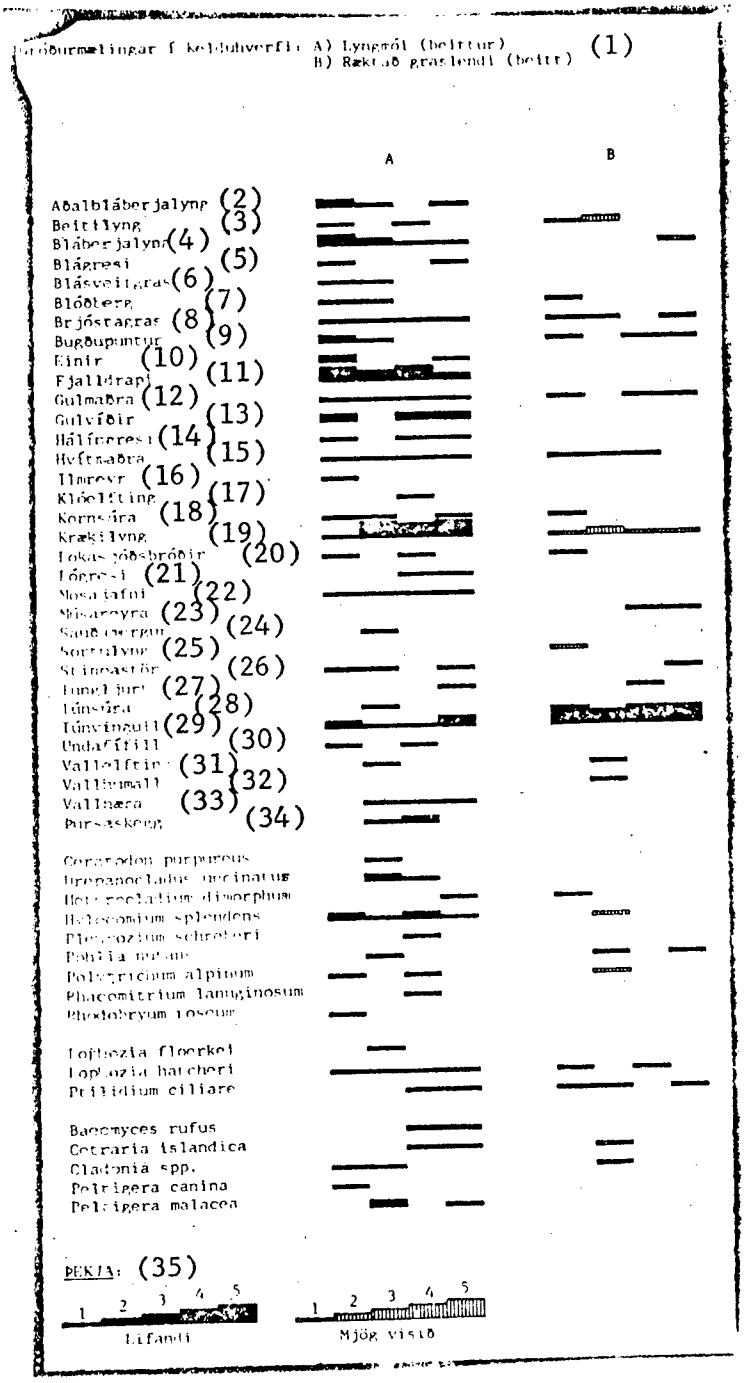
Björn Sigurbjörnsson said in his recent article that "Agust Bjarnason was talking nonsense when he said that the hardiness of growing land decreases when more grass is grown at the expense of other varieties. I would think that Sigurbjornsson is a prudent man and I therefore regard it as strange that he has not noticed that erosion is greatest where grass varieties are abundant, because their roots are rather shallow. I will very amiably point out to Sigurbjornsson an article by Sigfus Olafsson in the 1969 anuual issue of FREYR which deals with the growth of vegetation. It states: "After the planting of the field the surface is fertilized, and the chemical nutrients collect in the uppermost layer of the soil. In this way, the roots do not have to go far to seek nutrients, except water, under the soil. The roots of field grass are always rather shallow, and we can expect that at the next planting the roots will be unusually shallow because of the surface cultivation." Isn't it possible that the same applies to fertilized grass in sheep grazing land away from and near to farms? If this is the case, is it so strange to conclude that the application of fertilizer on growing land can lead to a greater danger of erosion, and isn't it worse to go out and do something rather than sit still? We can add that too great an application of nitrogen causes impeded plant seed development.

It is time for me to conclude because I have taken longer than I intended. It is clear that much remains to be said regarding these matters, and it is not my intention to write about this issue during the winter. I have many other interesting tasks to take care of. I hope that I have opened some people's eyes to the fact that the issues of land reclamation are major ones for the country and too big to be resolved by merely scattering fertilizer and Danish Festuca rubra from airplanes. People have to come down to earth and work there and acknowledge that there is overgrazing. A very observant man recently told me that all Icelanders would recognize the over-farming going on in the country if it were the British who were here practicing sheep farming and exploiting the soil in the same way that they plundered the fishing areas around the country.



Key:

1. Width of the fertilizer application



Key:

1. Growth measurements in Kelduhverfi: A) Heather (**grazed**)
   B) Cultivated **grass area** (grazed)
2. Vaccinium myrtillus
3. Calluna vulgaris
4. Vaccinium uliginosum

5. Geranium silvaticum
6. Poa Glauca
7. Thymus arcticus
8. Thalictrum alpinum
9. Deschampsia flexuosa
10. Juniperus communis
11. Betula nana
12. Galium verum
13. Salix phylicifolia
14. Agrostis tenuis
15. Galium pumilum
16. Anthoxanthum odoratum
17. Equisetum arvense
18. Polygonum viviparum
19. Empetrum nigrum
20. Bartsia alpina
21. Trisetum spicatum
22. Selaginella selaginoides
23. Cerastium alpinum
24. Saudamergur (sic; could not find Latin or English equivalent)
25. Arctostaphylos uva ursi
26. Carex bigelowi
27. Botrychium lunaria
28. Rumex acetosa
29. Festuca rubra
30. Hierarcium
31. Equisetum (no species could be specified; probably like next two)
32. Achillea millefolium
33. Luzula multiflora
34. Kobresia
35. Coverage
36. Living
37. Very sparse

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HUELVA'S PETROCHEMICAL INDUSTRY CREATES HEALTH PROBLEMS

Madrid OPINION in Spanish 28 Jul-3 Aug 78 pp 42, 43

/Article by David Fernandez Cabeza: "Huelva is Being Asphyxiated"/

/Text/ Huelva is being asphyxiated. "No to pollution." This is the slogan that the residents of Huelva chanted at a large rally of citizens seeking "Pulmonary Amnesty." The petition is still up in the air, waiting for someone to remember that there are more than a thousand children in this corner of the peninsula with "spathic" bronchitis and a thousand people looking for new homes because their neighborhood has been declared a "polluted zone."

The large complex of chemical industries dangerously close to Huelva has already caused the total ecological transformation of the area. The estuary of Huelva is devoid of fish and has turned into a sewer, while the eucalyptus trees along Paseo Montenegro dried up and were cut down in hopes that the situation would pass unnoticed.

Much Smoke in Exchange For Little

One fine day, Mr Lopez Rodo's enthusiasm for development laid its eyes on this southern city and ordered what they no longer wanted in Bilbao. In 1964, overnight, Huelva turned into one of the largest industrial centers in the country, with 60 operating chemical plants.

Since the important thing was development, the plants were placed three kilometers from the center of the city, much closer to the old quarter than some residential neighborhoods. Today a very high price is being paid for that unplanned "boom" that granted every kind of facility to the industries.

Recent studies show that the miracle of Huelva's industrialization, about which the former local authorities boasted so much, is no such thing at all. It turns out that, although provincial produc-

tion increased considerably, family income experienced no great change. The "miracle" was unable to prevent the emigration of 30,000 Huelvans between 1960 and 1970, and the number of jobs fell by almost 17,000 in that period.

According to the "Economic Report on the Huelva Center of Development," Huelvan industries need highly qualified personnel, who must come from other provinces. Also, due to the use of technology, the personnel is reduced, but auxiliary industries that would offer more jobs have not been built.

The Figures Cheat

Traditionally, authorities have tried to calm the people of Huelva by denying what could readily be seen. In the local press, writing about pollution was a forbidden topic. Now it is impossible to deny the obvious. However, the daily figures published by the pollution control monitors continue to show data that the man in the street does not believe. The truth is that these monitors measure only sulfur, which is principally produced by vehicular traffic, but there are other polluting factors that they do not measure, nor do they measure solid wastes.

The validity of these data leaves much to be desired because an overall figure is given by days and not hour by hour, which would be more exact. So when the daily average is figured, it is not known whether there were alarming indices during certain hours of the day.

According to data from the college of architects, Huelva's industries emit a hundred times more solid waste than the industries in Spanish cities its size. On the other hand, between February 1975 and February 1977, the city suffered 29 days of heavy pollution; 20 of those were technically termed "impermissible situations," 8 of them "emergencies" and 1 a "total emergency."

Children Victims

Smoke from the chemical industry envelops the city on many days. Occasionally, without forecasts of bad weather, Huelva awakes in the midst of a fog that is reminiscent of London. The number of people who suffer from asthma caused by pollution is hard to calculate. But many parents of children with bronchitis have organized and are doing battle.

Over a thousand Huelvan children appear to be affected by a genuine bronchitis called "spathic," caused principally by environmental pollution. It has been proved that on days when the pollution is greatest, these children's health deteriorates even

further. The only recourse to cure the bronchitis is to move them to the mountains, but that is a solution that is too costly for many families.

A Neighborhood Condemned to Eviction

After a study made on housing blocks of the Public Works Employers' Association--presently home to over a thousand persons--the grave danger that the residents are risking due to the proximity of the factories was detected. The extreme gravity of the matter has induced the civil government to take urgent steps. The neighborhood's 220 families will be evacuated to other houses that are being built in a less unhealthy place.

While Bilbao's companies have spent 800 million pesetas ince 1975 on mechanisms to correct pollution, Huelva's plants do not seem to be doing the same. Only the Provincial Association of Employers made an extensive public announcement in which it claimed "the companies are making the greatest efforts to improve operating conditions as much as possible in their oldest plants."

These claims were strongly criticized by the Federation of Neighbors Associations, accusing them of being ambiguous and unrealistic and demanding that a special anti-pollution law be approved for Huelva because it is felt that its case is not equivalent to that of other industrial zones of the country.

Awaiting Solutions

Huelva's municipal government has asked that the city be declared a "polluted zone" while the new Urbanism Plan envisions the removal of the industries from their present locations.

After the recent visit of the director general of the Environment to Huelva, the creation of a Subcommittee of Environment for Huelva was promised to investigate and put an end to the emission of industrial wastes.

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