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Worldwide Report

ENVIRONMENTAL QUALITY

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10 December 1982

WORLDWIDE REPORT

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AUSTRALIAN AIR POLLUTION NO THREAT TO NEW ZEALAND

Wellington THE EVENING POST in English 15 Oct 82 p 5

[Text]

Air pollution from Australia that reaches New Zealand is not much to worry about at present, an Australian scientist, Dr E K Bigg, said at the Meteorological Society Conference today.

"The rain does not become acid enough to be a worry to agriculture at the moment," he said.

Dr Bigg, who studies clouds physics in Sydney, said a background air monitoring programme was established by the Australian Government in 1976 on the north-west coast of Tasmania.

Because Sweden had suffered pollution problems from air passing over Britain, it seemed desirable to check whether New Zealand was receiving appreciable air pollution from Australia, he said.

With the help of the New Zealand Meteorological Service, measurements of particle concentrations and rainwater acidity and chemistry were started at New Plymouth in September last year.

New Plymouth was chosen because it was on nearly the same latitude as the Australian monitoring station.

The results had shown that concentrations of particles were generally higher at New Plymouth than in Tasmania during prolonged westerly winds, providing that the air had passed over part of mainland Australia.

Otherwise, concentrations were comparable.

The rainfall was consistently more acidic than at the Tasmanian site.

However, until the occasions when local sources could influence the result were removed from the analysis, it was uncertain whether this was an Australian influence.

In any case, the acidity was at present no threat to the environment and because of its sulphate nitrate and ammonium content might, indeed, be beneficial.

There were only a small number of occasions when New Plymouth got fully contaminated air from Australia.

This might have a subtle effect on the weather, but that was something future investigations would show more clearly.

DROUGHT IN VICTORIA POSES THREAT OF DUST STORMS, EROSION

Melbourne THE AGE in English 4 Oct 82 p 3

[Article by Carol Sides]

[Text] Victorians could soon see a repeat of dust storms which in the 1940s drought blacked out daylight and terrified rural communities, soil conservation authorities believe.

The authorities and some farmers believe the worst effects of the drought are only just beginning to appear. Ultimately the drought could cost Australians far more than their sheep flocks and cereal crops.

At risk are thousands of hectares of soil which conservationists predict could take up to 30 years to replace.

A Buckrabanyule farmer, Mr Laurie Douglas, said that even modern farming techniques stood little chance of preventing a re-farmers had only heard about. His far, 16 kilometres north-east of Charlton, is in the heart of one of the State's first shires to be declared a drought area.

"The complete blackout of dust was a frightening experience that has stayed with me for 38 years," he said. "You only had to be a few yards from the house to be engulfed in darkness."

"The experts have said a thing like that would never happen again. But there is no doubt the whole countryside will lift."

Heavy rain, which would inevitably come with summer storms, would pulverise the soil and leave it like talcum powder to be blown away by winds," he said.

He said ground exposed by grazing and crop failures was most vulnerable to summer rain. In a big downpour, large drops of rain hit the soil, destroying its structure and breaking it down further.

Mr Douglas has made his farm a showplace for soil conservation measures. In 1978 he won the Hanslow Cup soil conservation competition. In the past 20 years has continued an eroding control programme started by his brother in 1947 to bring back to production large tracts of land that was sheet eroded, rilled and gullied.

Record floods in the district this time last year severely tested the Douglas erosion control works. Today the Buckrabanyule Hill block and thousands of hectares of central Victoria are being prepared for the destructive combination of drought and wind.

An officer of the Soil Conservation Authority, Mr Denis Martin, based at St Arnaud, said yesterday farms could lose up to 12 centimetres topsoil through erosion whipped up by wind. The effect was compounded by sand

and soil ending up in waterways and covering roads. Copping paddocks would not recover from the effect for up to 30 years, he said.

Thousands of hectares of land were exposed to the risk of erosion by lack of cover caused by failed crops and stock grazing. Farmers had only recently started asking for help to prevent wind erosion, but there was a shortage of manpower, he said.

Finance for soil conservation in Victoria has dropped in real terms in the past five years. According to the annual report of the Soil Conservation Authority, grants for soil conservation works declined even in money terms from \$1.2 million in 1977-78 to \$1.05 million in 1980-81. This year's Budget allocation is \$1.7 million.

Mr Douglas said a diligent farmer would prevent wind erosion by ridging his soil. By using a chisel plough he could produce windbreaks across the paddocks to catch soil particles carried on

"I hope this drought will bring home to Government the importance of our soil," he said. "Once we lose that we lose the lifeblood of the rural economy. "It is a heritage we have to hold on to."

CSO: 5000/7509

EDITORIAL URGES FRASER TO STOP DAM ON TASMANIAN RIVER

Melbourne THE AGE in English 6 Oct 82 p 13

[Text]

MOST Premiers would be flattered to have an area of their State nominated for inclusion on the World Heritage List. But not the Tasmanian Premier, Mr Gray. In recent weeks he has been campaigning hard to have the Federal Government withdraw its nomination for the wilderness area of south-west Tasmania. Mr Gray thinks that the environmental significance of this region of mountainous rainforest and river valleys has been "grossly overstated". As far as he is concerned, the Franklin River — part of which his Government plans to dam for a hydro-electricity project — is for 11 months of the year "nothing but a brown ditch, leech-ridden and unattractive to the majority of people".

The Prime Minister, Mr Fraser, to his credit, has resisted the Tasmanian Government's pressure. He has said he has no intention of backing down. Regrettably, however, Mr Fraser has refrained from taking the next step which is to assert the Federal Government's supremacy over the area — a move that would effectively stop the despoliation to which the Tasmanian Government is so blindly and stubbornly committed. Politically, of course, such a move would cause problems. The Liberals presently hold all five House of Representatives seats, and Mr Fraser would obviously not want to do anything which might jeopardise them.

But he can't sit on the fence for ever. Sooner or later events will force him and his Government to take a stand. If he needs encouragement to do so, he can find it in the AGE POLL, published this week, which showed that while there is still widespread public uncertainty on the dam issue, only 24 per cent of Australians positively support the building of the Franklin dam while 39 per cent positively oppose it. More to the point perhaps, 49 per cent of Australians believe the Federal Government should intervene to stop the Franklin being flooded and the dam built,

as against 37 per cent who oppose Federal intervention.

Mr Fraser can also take comfort from the advice given to him recently by the Federal Attorney-General's Department that the Commonwealth does indeed have the constitutional power to override the Tasmanian Government on the dam-building issue. This being so, Mr Fraser should take his courage in his hands and announce his Government's intention to take over the wilderness area and to maintain it, like the Barrier Reef, as a national park. Outside Tasmania that would be regarded generally as a wise and statesmanlike decision. As Mr Fraser has said himself, the south-west of Tasmania is "an irreplaceable asset", and as such should be preserved intact for future generations. It won't be if Mr Gray and his power-crazy engineers are allowed to have their way unchecked.

CSO: 5000/7509

INJUNCTION ISSUED AGAINST LOGGING; PROTESTERS ARRESTED

Canberra THE WEEKEND AUSTRALIAN in English 2-3 Oct 82 p 3

[Text]

THE NSW Land and Environment Court yesterday granted an injunction, preventing further logging of rain-forest at Mt Nardi, in the north of the State.

Mr Justice Cripps ruled that no more trees be felled until Tuesday morning, when a full hearing will begin.

Two anti-logging protesters were injured and 29 were arrested in clashes with police and sawmillers before the injunction was granted at 3.30 pm.

Sixty-one people have been arrested since logging began at Mt Nardi, in the proposed Nightcap National Park, on Wednesday morning. They have been charged with a variety of offences.

A spokesman for the Nightcap Action Group,

Mr Bren Claridge, said the two injured protesters were taken to hospital with suspected broken legs. One was injured when a police vehicle ran over his leg, and the other when a logging truck ran over his foot.

About 200 protesters have set up camp on a private property adjoining the disputed logging area.

The Nightcap Forest adjoins Terania Creek Forest, the site of a violent dispute between loggers and conservationists three years ago.

After an 18-month, one-million-dollar inquiry, Mr Simon Isaacs, QC, recommended that no more than 6 per cent of the remaining unlogged area be logged.

CSO: 5000/7509

LAKE COLEMAN 'VIRTUALLY DEAD,' VICTIM OF INDUSTRIAL WASTE

Melbourne THE AGE in English 4 Oct 82 p 3

[Article by Rosslyn Beeby]

[Text]

Twenty-five years ago, Lake Coleman, near Sale, was a small, clear lake with white sandy beaches and abundant bird life. Now, it is virtually dead, its waters black and polluted by industrial effluent from the Dutson Downs sewer-

Dead trees line the shores of the lake, choked by poisonous, foam-encrusted sludge. Bird life is scarce and only introduced fish species such as European carp survive in the oxygen and light-deprived waters.

A wildlife artist, Charles McCubbin, who lives near Lake Coleman, says he has seen its waters so discolored that a white disc submerged in a few centimetres of water is invisible.

Mr McCubbin, a leading expert on Australian water insects, claims Lake Coleman is the State's, possibly the nation's, worst instance of water pollution.

"This lake is a graphic illustration of what would happen to the world if the Sun stopped shining," he says.

"Light can't penetrate the surface of the lake, which prevents photosynthesis. The water weeds die, the insects which depend on the water weeds have gone, and that means the native fish are unable to survive. The whole intricate web of life is broken."

The problem is getting steadily worse, with large areas of the the Gippsland lakes under threat of pollution from the Dutson Downs effluent, Mr McCubbin says.

Since 1957, effluent from the sewage farm has flowed into the Gippsland Lakes via Lake Coleman at the rate of about 15,000 megalitres a year. Industrial waste from the Australian Paper Manufacturers mill at Maryvale

accounts for 19 of the 20 megalitres a day of waste, which is treated at the farm.

The APM waste is highly colored by lignin, a toxic substance that occurs in the cellular structure of wood. Its exact chemical composition is unknown, as is the full extent of its toxicity.

Dutson Downs's waste discharge licence is controlled by the Latrobe Valley Water and Sewage Board, a delegated agency of the Environment Protection Authority. Under its licence, the farm has been allowed until 1991 to reduce the color of effluent discharged to Lake Coleman from 18,000 color units (near black) to 250 (the color of weak tea).

APM has undertaken construction of a \$40 million in-plant stop discharging liquid waste to Dutson Downs by 1987.

But local environment activists still want the board to spell out its waste-disposal strategies more clearly. The farm's licence was amended by the EPA this year, but the rate of waste discharged to Lake Coleman remains unspecified in the amended conditions. There is also no regulation compelling disposal of waste water by on-farm irrigation.

Mr Herb Guyatt, a founder of the Lakes Awareness Committee, claims metering wheels have "disappeared" from points where the effluent is discharged into Lake Coleman. He claims that contrary to EPA licence conditions, the weekly volume of waste discharged is neither measured nor recorded.

The Minister for Conservation, Mr Walker, has described the pollution of the Lake Wellington wetlands and Lake Coleman as a very serious situation needing urgent consideration.

SOLVENTS POSE STERILITY, OTHER RISKS TO CHEMICAL WORKERS

Melbourne THE AGE in English 6 Oct 82 p 6

[Article by Philip McIntosh]

[Text]

Thousands of Australian workers may be exposed to chemical solvents suspected of being hazards to the reproductive system, a trade union occupational health unit has warned.

The hazards include potential sterility or reduced fertility in men and possible menstrual disorders in women. Exposure of both men and women could lead to birth deformities.

"Both male and female workers are potentially at risk, and exposure by any route, including inhalation and through the skin, may be hazardous," the health unit said.

The chemicals are from a class of solvents known as glycol ethers.

A hazard alert on the solvents has been issued by the occupational health and safety unit of the ACTU and the Victorian Trades Hall Council.

A member of the unit, Dr John Mathews, said the two chemicals concerned, 2-methoxy ethanol and 2-ethoxy ethanol, were solvents with numerous industrial and consumer uses.

He said 2-methoxy ethanol was used as a solvent for many materials including dyes, resins, lacquers, varnishes and stains. It was also used as a perfume fixative and as a de-icing additive in jet fuel.

He said 2-ethoxy ethanol was used in lacquers, in the dyeing and printing of textiles, in varnish removers, cleaning solutions

and products for the treatment of leather, and as an anti-icing additive in aviation fuels.

Dr Mathews said particular attention should be focused on dyes, paints and industrial cleaning fluids, as these were the most likely sources of exposure.

A health and safety bulletin issued by the health unit said that as yet there had been no specific human studies. "But the strength and consistency of the animal experimental evidence makes it clear that human exposure should be dramatically reduced," it said.

"The relatively large number of workers with potential exposure to these glycol ethers is also cause for particular concern," the bulletin said.

Using United States figures as a base, the bulletin said the number of Australian workers likely to be exposed to 2-methoxy and 2-ethoxy ethanol should be in the order of 5000 and 21,000 respectively.

The ACTU has made a number of recommendations to its affiliates: that employers divulge whether the chemicals were now in use on their premises; if they were then substitutes should be sought; if no substitutes were available, exposure to the solvents should be reduced to the lowest technically feasible level.

The bulletin said ICI recently released a statement to customers alerting them to the potential adverse reproductive effects resulting from 2-methoxy and 2-ethoxy ethanol exposure.

INDONESIA

PRIVATE GROUPS URGE GOVERNMENT TO BAN DDT

Jakarta SINAR HARAPAN in Indonesian 25 Sep 82 pp 1,12

[Excerpts] The Consumer Affairs Institute (YLK) and the Indonesian Environmental Association (WAHLI) on 23 September called upon the government to ban the use of DDT immediately. There are in circulation in Indonesia hundreds of brands of DDT not recommended by the Insecticide Commission, and among them are brands that have not been tested at all.

Furthermore, the two organizations have evidence that on 28 August 12 people died in the village of Plaeng, Klaten, Central Java, as a result of DDT poisoning at a ceremonial meal.

This information was revealed to reporters at the Jakarta Press Club by Permadi SH, Engineer Erna Witoelar, and George Adicondro.

These two organizations fear that unless the government takes immediate action other fatalities will follow sooner or later. It has been discovered that producers of salt fish in Jakarta have sprayed DDT on fish being dried, and some vegetable farmers in Cipanas, West Java, and in Batu, Malang, have sprayed the poison on their produce.

According to leaders opposing DDT, the insecticide is also widely used against mosquitoes, and research shows that such use is a threat to human life.

DDT reportedly is no longer used in the industrialized nations because of evidence of its danger. There is therefore surprise in those countries that the use of DDT has not been banned in Indonesia.

There is a surplus of DDT in Indonesia, not because of excessive domestic production but because of exports of the poison by industrialized countries. The surplus of DDT in Indonesia is the output of chemical factories in Europe and the United States since there is no further market for DDT in those countries.

DDT from the United States flows freely into Indonesia through official aid channels. From 1969 to 1974 alone, Indonesia received an average of more than \$1 million for the purchase of DDT and other insecticides. YLK and WALHI view as strange the fact that, although Indonesian imports of DDT have reached about 4000 tons per year and are not being used for original purposes, the government still plans to build a DDT plant. The government's justification is that there are abundant raw materials from our petrochemical industry,

YLK and WALHI feel that because of the unrestricted distribution of DDT in rural areas and the existence of many pest control companies it is likely that DDT will enter human food supply in vegetables and fruits, and, through cattle feed, into milk and beef.

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CS0: 5000/8002

PHILIPPINES

MARCOS ACTS TO STOP BAY POLLUTION

Manila PHILIPPINES DAILY EXPRESS in English 14 Nov 82 pp 1, 6

[Text] President Marcos issued yesterday a series of directives to put an end to the dumping of wastes into the Manila Bay which, he said, causes marine pollution and therefore undermines the national development efforts.

The President's move was triggered by complaints from people earning their livelihood along the bay that indiscriminate dumping of wastes has not only caused the dwindling of marine life along the coastal waters but also poses a serious hazard to communities along the bay.

The President directed the Metropolitan Waterworks and Sewerage System to set up immediately a sewage treatment plant on a five-hectare lot in the Tondo reclamation area.

The President also ordered the MWSS to make a study of other sites in Metro Manila where sewage treatment plants may be set up to sanitize waste before it is dumped into the bay.

At the same time, the President directed the MWSS to speed up the cleaning of all public and private septic tanks in Metro Manila.

The MWSS has scheduled operations to clean up, for free, about 300,000 septic tanks in Metro Manila.

However, the MWSS said, those who want priority in having their septic tanks cleaned will have to pay a minimal fee.

In a related action, the President directed the MWSS to stop contractors from using asbestos water pipes on the ground that they are believed to be carcinogenic, or cancer-causing.

The MWSS is conducting a study on the possible harmful effects of asbestos water pipes in the wake of public concern that they might cause cancer.

CSO: 5000/4304

MOBIL LEAK POLLUTES BEACH, AROUSES CONSERVATIONIST ATTACK

Clean-Up Action

Bridgetown ADVOCATE-NEWS in English 30 Oct 82 p 1

[Text]

Gravesend Beach, St. Michael, and the adjacent sea, were polluted early yesterday by oily water coming from the nearby Mobil Oil Refinery.

The beach and sea became a messy sight, caused by the gallons of black, oily water which flowed into the sea from a storage tank which reportedly developed a leak during Thursday night.

But by late afternoon, the situation had been brought under control after a special task force of employees of the oil company carried out an intensive clean-up operation.

General manager of Mobil Oil Barbados Limited, Garrison, Mr. Massimo De Rose, said the situation was one which his company very much regretted, and was doing everything possible to have rectified as quickly as possible.

He said that he was still awaiting full details of the incident, but preliminary investigations had revealed that the damage to the sea and

the beach was caused by the dirty, oily water which had leaked from a storage tank.

Mr. DeRose said that emulsionised asphalt was usually stored in the small tank, but there was presently a quantity of dirty oily water in the tank, and as a result of the leak, the dirty water had ran through the gutter systems and made its way into the gutter that leads to the sea.

"It is not a stream of oil, but dirty water," said Mr. DeRose, as he sought to dispel rumours that it was more crude oil than water that had

polluted the beach and the sea.

He said that when it was realised yesterday what had happened, immediate steps were taken to stop the leak, but since it was oily water that had flowed into the sea, the amount that went into the sea spread like quite a lot.

In cleaning up the area, the surface of the oil blackened sand was removed, and a chemical liquid was sprayed

into the sea to destroy the oil on the water.

Mr. DeRose said that he had not been able to ascertain exactly how much water was in the tank, "but I do not think it was any large amount," he added.

But the situation did not go down well with people wishing to use the beach. One such person, Lionel Brancker, of My Lord's Hill, St. Michael, who came to the Advocate-News with his complaint, said, "something has to be done to prevent this kind of thing from happening."

Mr. Brancker said that the oil companies were not paying enough attention to pollution of the sea and beach by their products, and added, "what happened at Gravesend beach should not have occurred."

He said that it was not the first time that he had seen the Gravesend beach in such a "filthy state." He said that "It was all polluted before, but yesterday is the first time I saw it that bad."

Conservation Group's Criticism

Bridgetown THE NATION in English 1 Nov 82 p 24

[Text]

CHAIRMAN of the National Conservation Commission, Iris Bannochie, has strongly condemned the incident of beach pollution at Gravesend, St. Michael, over the weekend.

"They (Mobil Barbados Limited) should fix it, and stop giving us this trouble," said Mrs. Bannochie who added that it was a problem caused by the company.

She noted that the commission had been fighting the issue for several years but to no avail, even though many letters had been written, and several meetings held.

"Some action will have to be taken by someone else," she said.

The chairman explained that the company had a drain which flushed oily water out to sea whenever there was heavy rain in the area. But she contended that the company should find an alternative

place so that it would not cause the century-old gutter to overflow into the sea.

The oil spill was reported last Friday and it was to the extent where the oily substance was not only afloat in the sea, but made the beach a messy sight. Bathers were unable to use the beach since then.

Bannochie could not say when it would be comfortable for bathers to use the beach again, but she pointed out that her commission was hard at work to rectify the "unfortunate" situation.

A leak in a storage tank at the Mobil refinery at the Garrison was blamed for the oil slick.

According to Mobil's general manager, Massimo DeRose, a storage tank containing dirty water and some asphalt developed a leak in the early hours of Friday morning causing the contents to escape.

DeRose said it entered their gutter scheme and escaped into the sea. Normally the gutter would prevent anything that was floating from leaving the compound, but it apparently failed, he added.

When it was discovered, steps were immediately taken to correct the situation, and several workers using a special chemical dispersant to break down the mixture were employed to bring the situation under control.

CSO: 5000/7512

WATER POLLUTION REACHES HEALTH-THREATENING LEVELS

San Jose LA NACION in Spanish 15, 16, 17 Oct 82

[Article by Mayra Porras]

[15 Oct 82 p 1B]

[Text] A great deal has been said about the water problem. From time to time, whenever there is an epidemic or a disease caused by a virus, it is the same old story: Water must be boiled, hands washed before meals, and the endless recommendations known to everyone are repeated.

And yet, these are nothing but minor, and sometimes relatively ineffective, precautions when it is a problem of the polluted, unsafe water that has always been consumed by people living in the different urban areas of the country, a problem that has not been handled directly. It has been sidestepped, as if the danger facing these people could be put off.

We already see the consequences. Escazu, the most tragic example of the little attention paid to the quality of water, now leads the country with the most cases of hepatitis: 307 per 1,000 according to a study recently completed by the canton's health center.

"If we consider that for every case reported, at least three or four are not, then the figures clearly show that we are facing a veritable epidemic, undeniably caused by water."

These emphatic words of Dr Mauricio Vargas, director of the institution, give us an idea of the complexity of the matter and of the urgent need for a solution.

As if this were not enough, 80 percent of the people of Escazu are also suffering from parasites and 80 percent of all pregnant women are anemic. "It is incredible that only six kilometers from La Sabana, such things can occur without anyone's being bothered."

Swimming Against the Current

It cannot be denied that there have attempts to make improvements. A number of institutions would like to have carte blanche to change the water treatment system. But curiously enough, it is the people themselves who have refused. Dr Vargas attributes this phenomenon to the fact that under different administrations, the municipality has made a "warhorse" out of the "advantage" which its handling of the liquid constitutes.

"What they do not realize is that they may be saving a few pennies on their service, but how much is a life or disease caused by this irresponsibility worth?"

The Costa Rican Aqueducts and Sewer System Institute tried to take over water management a few years ago. The canton's response was to break the meters in protest of the meddling and the future potential rate increase.

The dilemma is now between the awareness of Escazu residents, the extremely poor service of the municipality, and the almost nonexistent possibility that another institution might take charge, especially due to the high cost involved, some 16 million colons.

In addition to the foregoing are the campaigns waged by the Ministry of Health which lead the people to think that boiling the water will ward off all the evils stemming from pollution.

"It is no secret to those who know that the hepatitis virus withstands high temperatures and that chlorinating the water solves nothing either, since certain bacteria and amoebas are not affected by the substance."

For his part, the municipal executive of Escazu, Rafael Angel Masis, spoke of a water commission. That commission is now trying to find short-, medium- and long-term solutions, inasmuch as it is highly concerned over the reports of intestinal diseases made to the health center.

But their idea of solving the problem goes no further than teaching the people "not to dirty the rivers." Masis says that at no time has the idea been considered of transferring the service to the Aqueducts and Sewer Institute. Commission members still believe that the institution makes business with water and that to have control of it is an advantage.

"We sincerely see no short-term solution," he says, thereby making it obvious that any attempt to change the situation is to swim against the current.

Revealing Tour

The idea of an inquiry into the water problem came from LA NACION, due to the constant reports of viral diseases. Since the problem was attributed to water, an order was issued for an analysis of the liquid from various urban areas with the idea that even if one sampling per place were not scientifically representative, the fact that even one had problems would show that the treatment system now used is not 100-percent safe.

As a result, Moravia, San Pedro, Desamparados, Escazu and San Rafael de Heredia were included in the microbiological analysis performed at the University of Costa Rica by the School of Microbiology.

Based on international standards, the water from the first three sites was classified as drinkable. But in the case of Escazu and San Rafael de Heredia, it was classified unsafe, due to the fact that it contained over 2 coliforms per 100 milliliters of water. Coliform bacilli are contaminated particles from the ground or fecal matter taken into account in analyses.

In San Rafael de Heredia, the total number of coliform bacilli found was 140 for every 100 milliliters of water, 70 of which were from fecal materials. In Escazu, the situation was even worse: Of the total number found, 1,600, 120 were of fecal origin. Although these results are not truly representative, they show that if, in a given place and on a given day, a water sampling yielded such conditions, then the situation does not look good.

This was obvious during a tour of water storage tanks in various places in Santa Ana and Escazu. No analysis is even needed, for the irregularities are so glaring that even the least perspicacious observer would realize the quality of water supplied to the people.

To begin with, only a few regions receive filtered, chlorinated water. The rest get water from pipes coming directly from the rivers, where the people even wash their clothes, bathe and dump garbage and waste matter, both physiological and of other kinds.

Those in charge of the tanks watch the sieves that strain out large objects such as stones, leaves and branches, but the incredible quantity of dirt and microorganisms is carried to the houses and the fact that such things are invisible makes the people think that the water is clean.

In addition, the places where the water is filtered use a fairly old process, that of "slow filters" mainly utilizing sand. But the big problem is that since this material is very expensive, ballast is substituted and it contains a large quantity of elements that not only do not purify water, but further pollute it.

It is not even necessary to go into the effects of the rainstorms in recent months. River waters are stirred up and no one is even surprised to see truly dirty, chocolate-colored water come out of the pipes.

Confronted with such a situation, how is it possible to continue to speak of the "advantages" of cheaper service, to question the possibility of transferring the service to more capable hands, to refuse to see the urgent need to solve an already old problem?

The relationship between the state of health of Escazu and the water ingested there clamors for a rapid decision from all organizations responsible for this alarming situation. And yet, nothing seems to have changed and children and adults continue to drink water that is 100-percent harmful.

The reports seem to get lost in the "turbid water" piped every day into the homes of an urban population that paradoxically enough is lacking in the most basic hygiene habits.

[16 Oct 82 p 1B]

[Text] The situation observed in Escazu and Santa Ana is almost identically the same in San Rafael de Heredia. There, although the analysis of the sampling taken for the study did not yield such high results, it cannot be denied that things are not good.

Actually, the data collected were to be expected when one considers that the water in the region is not treated in any way and that the rivers from which water is taken cover over 3 kilometers between cattle ranches and pastures, meaning that the river channels are polluted and more than once, animals of all kinds have been found in an advanced stage of decomposition.

Dr Arturo Romero, director of the San Rafael clinic, was surprised that the study did not have worse results. Actually, as we have already said, one sampling is not representative of the problem and only reveals the presence of major anomalies.

"In this area," the doctor explained, "the water distribution system is very old and it is certain that grey waters infiltrate the ground, only worsening the already exaggerated pollution."

Latent Epidemic

It is not at all unusual to see pieces of branches, leaves, all kinds of stones and even slugs come out of the pipes, but the worst of it is what no one sees: In an analysis made by clinic personnel, eggs of threadworms and other intestinal parasites were found.

This is the reason why 40 percent of all children under the age of 10 have parasites and most of these children are suffering from over two types of these microorganisms.

The danger of an epidemic caused by any kind of virus transmitted by water was shown a few months ago, with an outbreak of gastroenteritis that hit a large number of children. Some 250 were treated at the clinic and medicine was given to many more, representing an unexpected expenditure of 50,000 colons.

The fear of the clinic director, shared by most of those with any knowledge of the imminent danger, is that appearance of some serious disease that has been eradicated in Costa Rica by vaccination but that emerges due to the polluted water.

"We have never had proof that vaccinations are 100-percent reliable, because diseases such as polio are no longer seen. However, with all the foreigners coming in every day, water could become the prime carrier of any disease, afflicting us with a tragedy such as those seen in the old days."

But as if this were not enough, there is a water shortage in April and May, when the rivers nearly run dry because of the drought.

"Consequently, we are not only getting sick, but we have water for scarcely ten months of the year."

Solution

For Dr Romero, San Rafael de Heredia is running an unnecessary risk that could be avoided if the proper institutions assumed responsibility for the problem.

"It is indispensable to have the proper piping of rivers, build a new distribution and treatment system and to install meters in each house, without stopping to think that rates will be higher. We cannot compare the cost of a service with the price of lives that could be lost."

Furthermore, Dr Romero does not believe it is a good idea to set up clinics responsible for treating those that come to them with problems that could have been avoided.

Prevention is the best idea, according to Dr Romero. "Vaccinations have already done their job. Now it is the turn of environmental sanitation and and problem of water should occupy first place."

It is useless for the Ministry of Health to get rid of the parasites in the canton of San Rafael de Heredia two or three times a year if the basic problem is not attacked, which is the poor quality of the water ingested.

And yet, far from thinking about the most suitable solution, which transferring water to the Costa Rican Aqueducts and Sewer Systems Institute (A and A) would be, the municipality of San Rafael still thinks it is capable of providing the service, while it does consider some improvements necessary.

Gilbert Camacho, municipal executive, agrees that there is real concern over what is happening:

"The epidemic we have just had is the first in a long time. We have had so many problems with the water."

In order to reduce the ever present danger of a major epidemic somewhat, the water committee is determined to pipe about 2 kilometers of the river, although a loan of some 5 million colons would be needed to cover the approximate cost of the work.

However, this does not lessen the problem because it is above all a matter of the reeducation of the people, who for many years have lived in a healthy environment and who are now faced with unhealthy conditions without knowing what to do about them.

New Way of Thinking

Dr Leonardo Mata, director of the Health Research Institute (INISA), believes that at the present time, it is nearly impossible for public institutions to intervene, mainly for economic reasons, as a result of which he believes that the best short-term solution is to improve the technological knowledge of the people and reestablish proper health habits recently neglected.

"With a past filled with disease, the Costa Rican people have had decades of important improvements and we have forgotten many preventive measures, accustomed as we are to an environment free of microbes."

The official then points to the serious epidemic in San Rafael, which he visited, and believes that for every child treated, five did not go to the clinic.

"This problem is also seen in communities such as Escazu, where pure water was initially harnessed before the area became populated. It has now grown and industries, agriculture and livestock raising have flourished, making those distribution systems obsolete."

Along with the education given to the people, Dr Mata believes it very important for communities to have good distribution, treatment and filtration of the water and at least add chlorine, if indeed there is no substitute for the sources of pure water no longer found.

"All of this will bring back the old habits of boiling water and milk, washing one's hands after going to the bathroom and before meals, and it would often be necessary to boil water used to wash food so as not to fall into the vicious circle of using dirty water for the purpose."

It is preferable not to eat raw vegetables, but rather, to cook them, preferably with steam.

These are only a few immediate and superficial solutions to the serious problem the people face so as to prevent, at least provisionally, the transmission of any virus.

However, officials agree on the vital importance of the people understanding that to be "penny wise" can be "pound foolish" and that they must fight to gain a basic right: safe water.

[17 Oct 82 p 1B]

[Text] In the face of the imminent danger which polluted water represents, it is of prime importance for the Costa Rican Aqueducts and Sewer Systems Institute to take over the service, or at least, give advice on and partially finance problems requiring the most immediate solution.

While the Rotatory Urban Aqueducts Fund (FRAU) was set up in that institution in 1979 and introduced some improvements in the worst services of different

communities, the office is now practically without financing, making it very difficult to solve problems rapidly.

For his part, Walter Fabian, from the Ministry of Health, believes that independently of political problems, which have often constituted obstacles, it is urgent for the Aqueducts and Sewer Systems Institute to intervene.

"However, we cannot ignore the fact that there are persons who cannot pay for services, no matter what they represent for their health."

This is perhaps one of the biggest impediments for these people, for which reason they do not want any improvement in the situation.

What Has Been Done

The head of that institution's Department of Studies and Projects, Napoleon Cruz, explains that until 1978, the Institute of Municipal Development and Consultation (IFAM) was in charge of financing the construction of aqueducts in communities.

However, IFAM did not have the technical resources to do proper work. Consequently, a year later, the FRAU was set up and legally allocated resources, partly including a loan granted by the Bank of America.

Proceedings were thus instituted in order to include 33 communities in the program, communities whose water intake and distribution systems no longer met minimum safety standards.

The function of the FRAU would be to finance the municipalities, make studies, draw up plans, build aqueducts and thus improve the situation, which was already becoming problematical.

Unfortunately, even with the "soft conditions" on which the projects were financed, with low interest rates and long terms, many communities could not afford the high investment needed in most places.

"Along with this initial problem, there were the local interests and politics, which prevented many communities from having an opportunity to improve their water, and therefore, health conditions."

Of the initial list, only San Isidro de Heredia, Heredia Centro, San Isidro de Coronado, Santo Domingo, San Rafael de Heredia, Ciudad Quesada, Las Juntas de Abangares, Cartago Centro, Grecia, Santa Ana, Osa and Tejar del Guarco could be helped.

According to information from Cruz, a total of over 43 million colons was invested, representing 84 percent of what was to be used for the purpose.

"The fact that all the initially programmed funds were not used is due to the administration's decision that it was more important to devote the money to other projects. Consequently, the program is now totally without funds and the institution is seeking new financing."

Specific Cases

Concerning the communities of Santa Ana and San Rafael de Heredia, Cruz said that there had been some improvements. A new distribution system, storage tanks, sand strainers and pipes had been built and put in in Santa Ana.

"Only the water treatment plant and the meters are now lacking. They would cost about 15 million colons to install."

For its part, San Rafael de Heredia must still complete its system, put in meters and look for new sources, since those existing are totally polluted. The cost would be some 5 million colons.

In Escazu, the case was different. It did not initially wish to join communities requiring the services of the FRAU and is therefore now on the waiting list. If it should find the money needed to continue the program, the canton would have to have a total overhaul and expansion of the water distribution, filtration and treatment system, costing over 10 million colons.

These three communities are lacking in the most important element: suitable purification of the water, since the time when the rivers were completely clean is long gone.

Something which also affected Escazu was the transfer of part of the aqueducts and sewer services, specifically those given to San Rafael. In addition, the 400,000 colons advanced for the most urgent needs were used by the municipality to pay for the services of members of the Administrative Board which had been in charge of water for many years.

As a result, the only possibility for improvements in these and other communities in need of assistance is to obtain financing for the FRAU. According to Cruz, steps are now being taken with the World Bank and the Inter-American Development Bank (IDB) in order to resume work that had to be halted and that can no longer be postponed.

In the Meantime

While the proper institution for handling the problem is doing everything possible to find a solution, that solution will not come immediately. Everything depends on the possibility of uncertain financing, meaning that for some time to come, things will continue as they have.

As Dr Mata emphasized, we shall have to educate the people again, just as when everything was polluted and absolute precautions were necessary.

However, this literal step backwards did not have to be taken by the country. The lack of foresight and trust caused institutions "to rest on their laurels," proud of all that had been achieved and forgetting that one has to work to maintain what it cost so much to acquire.

But the problem remains, growing day by day, and those affected will realize sooner or later that it goes beyond a simple bill that must be paid. The institutions responsible will have to make a decision, independently of the financing that has not come. Otherwise, the danger lying in wait for Costa Rica draws closer and closer, threatening to overwhelm us with a tragedy which, who knows, could have been avoided.

11,464

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VILLA CLARA WILDLIFE PROTECTION ACTIVITIES NOTED

Havana BOHEMIA in Spanish No 41, 8 Oct 82 pp 90-92

[Article by Alfredo Nieto Dopico, Panorama of Science and Technology Section]

[Text] When one enters Santa Clara by any of its access roads, one can see that the city is in a valley and that the most prominent of the surrounding heights is the Sierra Alta de Agabama Range which occupies the area to the southeast of the provincial capital of Villa Clara.

The view which this mountainous area offers is beautiful. What is even better is to know that in this territory an infinite number of indigenous species of flora and fauna live in a natural environment, many of which are endemic to Cuba and are in danger of extinction.

Northeast of the city are the massive mountains with the Minerva dam and its surroundings and the Santa Fe hills where the Cubanacan wildlife preserve of about 20,000 hectares is located.

This project, which is of extraordinary benefit, owes its existence to the members of the wildlife protection committees set up in Villa Clara Province and its capital city which, with the support of the local government and the collaboration of specialists from scientific institutions in the province, have taken on the task of carrying out preliminary studies for the area's development.

The choice of this territory is justified because it has a wealth of interesting flora and fauna and because it consists of serpentine savannas of little agricultural use which are set aside as forest preserves, and have several reservoirs including, in addition to the Minerva, the dams of Ochoa, Agabama and Gramal.

The existence of this place gains even more importance if we taken into account that in the province natural woodlands occupy only four percent of its area.

The small group of experts and workers at Cubanacan also carry out research projects in which scientists, specialists and students of the "Martha Abreu" Central University and the Felix Varela Advanced Pedagogical Institute participate.

The young foresters who guard the area are assigned territories in which they enforce the conservation laws and make observations on the behavior of the various wild species. In fact they are valuable assistants to the specialists assigned to process the data they collect during their extensive trips.

This scientific research, carried out primarily in the serpentine masses of the Sierra Alta de Agabama mountain range, was supplemented last year by the work of a conservation group from the Biological Institute of the Cuban Academy of Science headed by Enrique del Risco, a candidate for a PhD in biology and Barbara Sanchez, Luis Montos and Carlos Chiappi.

They determined the presence of valuable mammal species among our fauna: deer, which are in abundance in the vicinity of the dams, and jutia conga, monkeys and carabali which live in the hills and dense woods.

Dozens of birds of the most varied types add color to these places and with their songs break the silence and give the visitor a pleasant feeling.

UP to now 55 species of birds, the majority of which nest in Cuba, have been identified. Among these are 18 species endemic to Cuba, or nearly so, including among others the tocororo, the sparrow hawk, the mayito, the whiteheaded ringdove, the carta Cuba, the gnome owl, the nightjar, quail, varieties of green carpenterbirds, the churroso, the javado, and the escapulario, as well as other migratory birds which visit us.

There are well defined places which are kept as nature preserves because of the high concentration of uniquely Cuban plants of great scientific interest, among which are several varieties of palmacious plants, cactus and melocactus. Among the latter, the Melocactus actinocanthus sreces are carefully protected since they are locally endemic and there are only a few specimens.

Some of the rivers with the greatest volume of flow of the central region of the island originate within the Sierra Alta de Agabama mountain range: the rivers Agabama, Sagua la Grande, Sagua la Chica, Primero, Manajanabo, Ochoa..

For the development of this area and for the protection of the flora and fauna, reforestation without dealy is considered essential and it should be based on the criteria of saving and indigenous vegetation and enriching it, especially along the banks of rivers and streams, with fruit and wood trees which will provide food and shelter for the animals.

Climatological studies are also being made and necessary rural roadways are planned to insure internal communication. A building program of small dams will soon be started.

Although it is a new institution on which the practical work began just over a year ago, Cubanacan has already produced positive results due to the selfless work done by its workers during that period under the direction of a scientific council consisting of professors and technicians who devote a part of their spare time to this activity.

The most important step is the creation of the area, of which the people of Villa Clara are well aware, and its development goes hand in hand with the knowledge being acquired by the masses, especially the youth and children, who in one way or another participate in the development of this project.

We have a Mallard duck breeding project which is in full operation, allowing us to start repopulating some preselected reservoirs with a view to incorporating them into the natural environment.

The guinea fowl has been introduced successfully and is reproducing without much difficulty. For some months the adaptation of a number of European deer of the white, black and spotted varieties has been in progress, and their controlled introduction into the area is under study.

At first glance, this might seem an easy task but this is not so. Only workers who love their profession and have a high sense of responsibility are capable of dedicating themselves patiently, without regard to the hour of the day or the weather, to the care of these precious animals, plants and other elements of the environment in which they live.

The first thing we learn is the difference in the traditional handling of domestic animals, however untamed they may be, and the wild animals which never stop being wild. A bull or a colt can be broken with a lasso, by skill or by force. However, under no circumstances can these procedures be used on deer since they are so nervous that when they are attacked they may even collapse and die.

To capture some of these animals, a specially made net is used. In the best of cases a dart with tranquilizer shot from a pneumatic weapon immobilizes them for a time.

The tasks involved in introducing a species are more complex. This is a very delicate matter. Different species of animals have developed in different parts of the planet in accordance with their evolution and in accordance with the ecological characteristics which have determined the habitat of each of them.

The introduction of an exotic animal into a country is not a simple decision. On the contrary, it involves a serious responsibility since if studies are not made and the appropriate measures adopted, it can become a harmful factor in the ecological balance of a given area.

In these cases, the animal is studied not only in relation to the effects that the new environment may have on it but it is equally important to know the consequences that its presence may have on the environment.

After clarifying the climatological factors, one of the main problems is the food they eat. One must observe the plants and seeds which they eat, the existing supply and obviously, the risk to the existence of these plants which may be endangered. In this case an appraisal must be made of what is most important.

The Guinea hens were not arbitrarily released in various parts of this protected area. The necessary analysis was first made taking into account what their presence could mean to the quail which, though smaller, is a ground fowl with similar eating habits, and its value for hunting purposes is highly regarded.

The Cubanacan experts recently learned a very interesting lesson without planning to do so. It had to do with methods of observation. It was in a certain area where the vegetation was a thicket, consisting of shrubs and small trees, mostly thorny, which appeared to have little or nothing to offer to the fauna, so it was decided to cut them down to plant other trees in their place. To the great surprise of everybody, in spring they saw that the small birds preferred the small trees for nesting among the dense and thorny branches which provide protection for their chicks.

The luxuriousness of the place, and the attractions it offers the visitor in direct contact with nature, do not divert attention from what we consider the main point, which is that this place is a solid example of the activities taking place throughout the country in that beautiful task of protecting the flora and fauna.

9204

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NICARAGUA

PROJECT TO PROVIDE MORE WATER FOR MANAGUA

Managua EL NUEVO DIARIO in Spanish 10 Oct 82 pp 1, 7

[Text] Carlos Espinoza, deputy director of INAA [Nicaraguan Institute of Aqueducts and Canals] informed EL NUEVO DIARIO that \$50 million will be invested during the fourth stage of the More Water for Managua plan which will begin at the end of 1983. The plan contemplates the construction of 37 wells on the shores of Lake Tisma, which will provide 36 million gallons of water a day.

Espinoza explained that in 1981, a World Bank loan of \$3.7 million was obtained to finance the studies and the final designs for the project which will be the fourth stage of the More Water for Managua plan. The World Bank will also finance a study on the water requirements of the population projected up to the year 2000.

Master Plan

Part of this loan will pay for preliminary studies for the water distribution master plan, which will be carried out in stages, and for the preparation of the final designs and the development of the Tisma area. Espinoza pointed out that Lake Tisma was chosen to supply water for Managua because the expense would be less than if either Lake Granada, whose waters would have had to be chemically treated, or Lake Masaya, which would also involve higher expenses, had been chosen.

Espinoza said it is expected that the plan for the fourth stage of the More Water for Managua plan will be carried out promptly if all the World Bank funds arrive soon, as it is anticipated that neither Lake Asososca nor the wells dug near Managua will provide enough water in the next few years.

38 Kilometers of New Pipe

Espinoza said that since 1981 the INAA, working through the Unidad consortium, has had a total of 38 kilometers of streets and avenues dug up in Managua for the installation of new pipes to supplement those already there to improve the water pressure so that it will reach the homes in the capital without difficulty.

Espinoza also stressed that the Unidad consortium is required to restore completely the pavement which has been torn up. It should all be in good condition by the end of 1982 or the beginning of 1983 when the contract ends.

The addition of pipes in Managua is one of the projects being carried out under the third stage of the More Water for Managua Plan at a cost of \$10.1 million which are being financed by the World Bank, the central government and INAA, and should be completed by June 1983.

Espinoza said that under the third stage of the plan, four wells have already been dug in various parts of Managua, and 4 million gallons of water will be obtained from them daily. An additional well is being dug which is expected to provide 2 million gallons of water daily.

Two New Tanks

He also said that under the third stage of the plan a steel tank will be constructed at kilometer 8 of the southern highway with a storage capacity of 126,000 gallons and another tank at kilometer 13 and 1/2 of the same highway, which will replace the one which is there now and which is in poor condition.

It is also contemplated that the Altamira tank's pumping capacity will be increased through modern equipment of greater pressure capacity which will allow operation without problems during the next 5 years.

In conclusion, Espinoza said that with the construction of the new wells and tanks, Lake Asososca will be able to maintain its level for an extended period of time.

9204

CSO: 5000/2009

WATER PROBLEMS VIEWED; TREATMENT CALLED INADEQUATE

Beirut AL-SAFIR in Arabic 24 Oct 82 p 6

[Director of 'Ayn al-Dulbah Water Authority: Political and Administrative Reasons for Water Crisis; Treating With Chlorine Not Sufficient To Deal with Pollution]

[Text] Nasir Nasrallah, director of the 'Ayn al-Dulbah Water Authority, has revealed that politics, special interests and pressure are the true reasons for the cronic water crisis. He did not deny the rumors about polluted drinking water, saying that the means of treatment are not enough since there are no modern purification sites except the station at al-Dayshuniyah, which is considered the most modern in the Middle East.

Nasrallah explained that the problem of water's not reaching the upper floors [in apartment buildings] is caused by residents' opening up the meters and said that a campaign to fix these meters will begin within 15 days and will last approximately 3 months.

All this came out yesterday in a comprehensive interview with Nasrallah about the water crisis in the capital and the rest of Lebanon, in which he said:

"The water policy followed from 1943 to the present is the true reason for this intractable crisis. The Ministry of [Hydroelectric] Resources is linked with two main directorates, the General Directorate for Water and Electricity and the General Directorate for Investment. Unfortunately, it appears that these directorates have turned permanently to investment, while stopping providing water and electricity completely."

He added, "Moreover, the budget of the Ministry of Resources is no more than 50 to 60 million a year, distributed among the districts for favors, influence and rewards, not according to need. Take for example what happened with us at the Dayshuniyah station, when I personally asked UNICEF to make an operational and long-term study on providing pure water from all the Authority's sources. Studies were made, money provided and requirements for the system were met. However, the system required two persons: the first began work a year ago and has not finished yet, and the second has not begun. Every day there are different excuses."

In answer to a question about the reasons for delays in using natural water sources, Nasrallah said:

"The main reason is politics, because the capital's water problem can be solved only by bringing water from the Awali River. However, some influential people in the south refuse to implement this project, demanding that the second phase of the Litani project be implemented to provide irrigation water for the south at a level of 800 meters. This project would take 10 years and would mean a delay in providing water to the capital for the same period, although water could be restored to the southerners by bringing water from al-Qir'awn Lake using the force of gravity, thus providing water to all parts of the south."

He added, "Although the politicians understand the situation, they insist on their positions merely for show."

Answering a question about drinking water pollution, Nasrallah said: "When water is purified, it is put under specific conditions, the most important being the sedimentation, purification and sterilization tanks. Because these conditions are not available in any water station except al-Dayshuniyah, I cannot say positively that the water is safe for drinking."

He added, "I cannot even guarantee the purity of al-Dayshuniyah's water, which is purified and sterilized according to proper scientific methods, after it passes through the system. Since the facilities are not complete at the other stations, the water may be ruined."

Nasrallah was asked, "How does the Authority allow the release of impure water?"

He said, "Ayn al-Dulbah's Water Authority depends on unsettled ground water, which is mixed with sediment from swamps and other similar places. It is sterilized by adding pure chlorine. However, in my opinion, this is not sufficient, and we are now in the process of bringing water from wells in the south, such as in al-Hazimiyah, Galerie Sam'an, al-Qartabawi and elsewhere, to the Dayshuniyah station to treat it before pumping it."

He added, "The subject of preventing pollution is in turn linked with not cutting off electricity. Unfortunately, this is the case. The water pressure inside the system is stronger than the pressure outside it. This means that swamp sediment and other leakage will not get into the water pipes unless the inside pressure, which counters the outside pressure, stops. The inside pressure will not stop unless the electricity is cut off, when the pumping stations will stop. We rely on increasing the amount of chlorine for purification, but this is not sufficient."

"The solution is in the hands of the government, and the future depends on the policy that the new regime will follow to provide water using the force of gravity, thereby reducing the cost of bringing water and providing a uninterrupted supply."

"The previous policy depended on fragmentary ways of providing water because of pressure, favors, deals, special interests and currying favor. It was a faulty policy which did not serve the citizens' interest."

About the cost of a project to provide water naturally, Nasrallah said, "Contrary to what some people believe, the cost of such a project would be no more than 700 million Lebanese pounds. If the required amount is set aside, the water crisis in Lebanon could be solved within 5 years. However, before projects and before setting aside money, some citizens must stop playing with the meters and realize that the national interest requires that they work together and forego selfishness."

9882

CSO: 5000/4503

WATER SHORTAGE THREATENS CAPITAL

Gaborone DAILY NEWS in English 5 Oct 82 p 1

[Article by Seatlholo Tumedl]

[Text]

GABORONE, believed to be one of the fastest growing capital cities in Africa, is likely to experience water problems as it expands by the day.

The 34-million cubic-litre Gaborone dam, originally planned to supply a maximum population of about 20 000, is presently only 42 per cent full after it received only two thirds of the normal water recharge last year.

This is coupled with an annual evaporation rate of 1.7 litres which is about four times the annual rainfall of 450 millilitres which goes into the dam.

The town, with its present population of 59 700 people, consumes some 21 000 kilolitres per day with industries using between 55 and 60 per cent of the supply.

The water situation in Gaborone causes considerable concern to the Government and the Water Utilities Corporation.

In an interview, the Chairman of the Water Utilities Corporation, who is also the Permanent Secretary in the Ministry of Water Affairs and Mineral Resources, Mr Charles Tibone and the Chief Executive of Water Utilities, Mr Colin Sayles explained that there was a need to raise the wall of the dam by eight metres and that this would cost about P30 million.

Other projects in the pipeline include building two supplementary dams on the Kolobeng and Metsimotlhabe rivers.

According to the water officials, the projects should go as follows:

With its present size the

Gaborone Dam should be able to supply the town up to 1984. After the eight metres' rise, the dam should supply the town up to 1987. After this the Kolobeng dam would help the water supply demand up to 1990 after which water from Metsemotlhabe dam would be needed.

When all the sources around Gaborone are exhausted, the water authorities might have to turn to international rivers such as the Limpopo for the town's water supply.

Despite the neat layout of plans, there is a serious lack of finance to get the projects off the ground. According to Mr Tibone and Mr Sayles, negotiations with potential sponsors including the World Bank have been held but none of the funding bodies had yet made any commitments.

The short term projects, according to Mr Sayles, include investigating ground water supply at Ramotswa. The Water Utilities Corporation also intends temporarily raising the Gaborone dam's spillway by one metre before the end of the year. Mr Sayles explained that with this improvement the dam would retain much more water and increase its yield.

The Corporation also intends to reduce evaporation losses at the dam by "a destratification method."

Mr Sayles explained that this was a process whereby the body of water in the dam's reservoir would be turned over to obtain an even temperature at all levels.

This is expected to reduce the surface water temperature thus reducing evaporation.

The Chief Executive of Water Utilities also said if we do not get a recharge of the dam this year "restrictions on water usage in the town will be necessary."

He also advised that residents of Gaborone should be aware of the need to conserve and use water carefully. "We have to use water with extra care because we live in a semi-arid area," he said.

The water situation may also affect the work which has already started at Gaborone West.

In a separate interview the Senior Planner in the Department of Town and Regional Planning, Mr Jan Wareus said insufficient water supply in Gaborone was likely to hold up on the construction of Gaborone West.

It is expected that when Gaborone West is complete the town's population will be between 128 000 and 148 000 people and that the city will consume some 40 000 kilolitres of water a day.

CSO: 5000/41

BRIEFS

BIG LANDSLIDES--In mid-September this year, two big landslides occurred on the main and sole operational highway linking the North-West Provincial capital of Bamenda with the West Province or in fact with the rest of the United Republic. The first occurred at Mbouda and a few days later the situation was further aggravated by an even more serious landslide at the Provincial border town of Santa some 24 km from Bamenda. Within a few days road technicians were able to find a suitable deviation for the road at Mbouda. But the problem at Santa was of such magnitude that for more than a week engineers were unable to find a solution that could ensure the constant flow of traffic to and from Bamenda. The landslide caused a large portion of the road to sink creating a huge crater more than ten metres deep and several metres wide. Eye-witness accounts from local residents said the road sank at about 9 a.m. following a brief earth tremor and a loud explosion which was heard several kilometres away. At the time of the explosion there was no rain which was heard several kilometres away. At the time of the explosion there was no rain which led to initial rumours that some explosive might have been planted in that portion of the road; such by whom and for what reason no one would say for certain. [Martin A. Nkemngu] [Excerpt] [Yaounde CAMEROON TRIBUNE in English 27 Oct 82 p 3]

CSO: 5000/40

IRON ORE MINING BRINGING 'WIDESPREAD POLLUTION' TO WATERWAYS

Monrovia DAILY OBSERVER in English 5 Nov 82 pp 4, 8

[Excerpts]

Officials at the Liberia Hydrological Services, which was established in April 1972 to identify, study and protect the nation's water resources, provided the Daily Observer with a series of reports, bringing to the attention of Government, Lamco and other mining companies the very serious problems being posed by the widespread pollution which iron ore mining was bringing to several Liberian rivers and creeks and even the Atlantic Ocean.

As early as August 1972, a report written by Dr. A.E. Nyema Jones, then Deputy Minister of Lands and Mines, and Mr. William Stewart, Director of the Liberia Hydrological Services, confirmed that the processes of ore extraction by Lamco (and other mining companies) dump millions of tons of waste materials on mountain slopes or other 'convenient' areas, from where

they find ready access into nearby streams and rivers.

Red Drinking Water?

Several reports from the Ministry say that Lamco has dumped its wastes directly into natural rivers such as the St. John's, which spans not only Nimba, but Bong and Grand Bassa counties as well. This, said one report, leads to pollution, posing danger to human beings, aquatic plants and animals. A more recent report said that by the end of 1977 some 4.4 million cubic meters of waste material had been dumped into Lamco's Alpha Valley, 20 million cubic meters of waste material had been dumped into the Secca Valley and 54 million cubic meters of waste had been dumped on the south east side of Mount Nimba. According to the report, most of the waste material is washed into the St. John's and the Yaniga rivers. The Yaniga River runs on the border with the Ivory Coast, bearing the potential of an international question.

Protein Denied

Because the St. John

River is completely reddened and polluted, the people who live along its banks, in Nimba, Bong and Grand Bassa, can no longer use it for drinking, for no one, including the honorable Lamco General Manager, will drink red water.

The people's chief source of protein has also been cut off, as fishing in the St. John's has been seriously hampered.

The World Health Organization has stated that the maximum desirable level for iron in drinking water is 0.1 milligrams per liter. But tests in the St. John River show that the iron content of its water has been as high as 1.2 milligrams per liter.

The Daily Observer has carried numerous, well illustrated articles showing the systematic destruction of the city of Buchanan by

RAINS BRING RELIEF TO DROUGHT-STRICKEN AREAS

Johannesburg THE CITIZEN in English 3 Nov 82 pp 1, 2

[Article by Keith Abendroth]

[Text] SOAKING country wide rain has brought relief to most drought-stricken areas and farmers are confident drought conditions will be broken in the next few days.

A spokesman for the South African Agricultural Union said yesterday that apart from a few areas in the Northern Cape, indications were the widespread drought had ended.

"We spent the morning talking to farmers in many different parts of the country and almost all of them say they are wearing grins from ear to ear," he said.

Rain in the Transvaal has been general, although insufficient to refill sadly depleted dams.

Planting is now being undertaken on soil softened by steady, penetrating rains.

Welcome rains have also fallen over most of the Cape--up to 70 mm within days in some areas--and grazing is rapidly improving.

In the southern coastal region of the Cape, farmers are struggling with a different problem. Although happy with the rains, they are battling against high winds.

Farmers in Natal seemed the happiest, said the spokesman.

Indications are the province will be delightfully green within weeks--promising a good summer holiday season for inland holiday-makers as well."

In some districts of the Free State and Far Northern Transvaal farmers can now abandon expensive and time-consuming efforts to cart in water for their stock. Nearly 40 districts are still listed as grazing distress areas, but it is expected this classification will soon be changed.

In the Tzaneen area of the Transvaal Lowveld, farmers estimate drought has already caused a five to 10 percent crop loss.

In other areas of the Lowveld farmers have planted up to 60 percent lower tomatoes than usual because of water problems.

The KwaNdebele Government has spent about R20 000 a week on water for its citizens. According to a spokesman for the country's Works Department, the drought has left it short of more than four million litres of water a day.

But despite the relieving rain, the price of some dairy products may still rise.

Heavy rain in Natal over the past three days has greatly improved the water situation at all Natal Parks Board resorts.

For the first time in several months water can now be obtained around-the-clock at the St Lucia camp. The Umfolosi River is again running strongly after drying up early last month.

The situation has also improved vastly in the two areas probably worst affected by the drought--Utrecht in Northern Natal and Pongola in Zululand.

CSO: 5000/31

THREAT OF ACID RAIN DISCUSSED

Johannesburg THE STAR in English 16 Oct 82 p 7

[Text] Research on acid rain, the spreading scourge of industrialised societies, has begun in South Africa.

The chief air pollution control officer for South Africa, Mr Martin Lloyd, said the situation would not be easy to study because even thunder storms are thought to change atmospheric pollution.

Therefore, the Highveld high temperature electric storms in summer are going to be a critical factor to be examined in the analysis of acid rain, making the task even more difficult.

The rains problem was first seen over a decade ago in the Scandinavian countries. Their research pointed an accusing finger at windborne pollution from coal and oil-fired furnaces in the UK.

However, the full picture is still not understood and is shrouded in controversy, says Mr Lloyd. Britain recently asked scientists to review available data on acid rains.

Mr Lloyd said there are several factors in South Africa thought to mitigate the experiences with acid rain elsewhere: low rainfall, alkaline soil in a few areas which acts as a neutraliser, and the absence of lakeland.

It is hoped research will show what is happening in this country, whether it is storing up trouble for the future or creating headaches elsewhere, says Mr Lloyd.

Escom has been asked by the Department of Health to investigate the situation.

A single modern power station annually emits 140 000 tons of sulphur dioxide, thought to be one of the components of acid rain, but taken with output from industry as a whole is insignificant.

Clean-air funds here regard the existing technology to control air pollution being used in Europe and America as unreliable and expensive. Its use, they argue, would add R200 million to the cost of a new power station.

Mr Lloyd says it is therefore policy to discharge sulphur dioxide from 3 000m high stacks. "We believe by diluting the sulphur dioxide into the high atmosphere and spreading it over 1 000 sq km or more it will not immediately affect soil or vegetation," he said.

"This is not the solution but it gives us time to study further promising developments in technology."

However, the controlling body of Britain's power stations, the Central Electricity Generation Board (CEGB) has been attacked for causing pollution beyond its bailiwick because of its tall stacks policy.

In South Africa, an estimated 250 000 domestic coal burning stoves, mainly in black townships, are also seen as a factor in the acid rain equation. Here better housing and a supply of electric power are the answer.

Escom says it cannot produce power without pollution, and since its projections for energy-use shows an increase it must ensure it is not a significant despoiler of the atmosphere.

Miss Margaret Bohm, a graduate in training with Escom researching acid rain, says collection and analysis of rainwater is not easy because of the limit on the quantity and contamination risk throughout.

Her own studies of the problem in Vanderbijlpark before joining Escom posed more questions than they answered, she says. One of her first tasks will be to find out what is the natural pH of rain.

"We simply don't know," she said. "Experience has shown that acid rain is not necessarily less than 5,6."

To determine this a monitoring station is to be set up in industrial smoke-free north-western Transvaal, but, even here researchers will have to guard against windborne pollution from Botswana.

Miss Bohm is at present solving the problem of automatic sampling at Escom Rosherville laboratories. "If you leave a container out in sunlight or in a lab, the pH is going to increase, invalidating results," she said.

Such are the challenges she has to overcome.

Her auto-sampler, once perfected, should not only measure pH values but read off the organic and inorganic substances found in rainwater.

A network of samplers to study the dispersal and transport mechanisms of pollution downwind of source is expected to be in operation by the end of 1983 after trials in the Cape.

Escom is also using a converted executive aircraft packed with instrumentation to survey the atmospheric pollutants from their stations. This, said a spokesman, gave them the ability to chase aerial pollution.

Miss Bohm one day hopes the flying laboratory will help her unlock the secrets of an area beyond the point of the source of pollution where weather is "made."

However, it is in this area that South African researchers believe chemical changes determined by extremes of temperature occur in pollution in an aerosol form before it falls as acid rain.

'Flying Laboratory' Helps the Research

A twin-engined aircraft used on dawn patrols over the eastern highveld and elsewhere in South Africa may one day soon help Escom unlock the secrets of air pollution, including acid rain.

Its "flying laboratory," operating at altitudes of up to 47 000 m at first light, is helping researchers study the origin of pollutants and their interaction with weather and climate patterns.

The aircraft leaves its hanger at Grand Central Airport, near Johannesburg, from 5 am onwards, later in winter, to "chase" pollution — dust and gases — from industry, agriculture and nature.

Pollution samples analysed and noted by equipment on board the aircraft are snatched from the atmosphere by probes mounted externally on the sleek fuselage.

These probes for dust, temperature, gases and moisture

analyses have been designed to operate at an airspeed of 120 knots (60 metres a second) in flight.

Escom's dawn flights enable researchers to understand the transition between the layered atmosphere characteristic of night and early morning periods to the well-mixed atmosphere of day.

The meteorologist with Escom's air pollution team, Mr Frank Pearse, said studying the layering affect, vertical stability of the layers and windfield enabled them to make recommendations on pollution control and power station sites.

"Our understanding of this layering mechanism will help us to make more rational decisions about the optimum stack height for a large power station or whether pollution control equipment need be introduced," he said.

"Pollutants emitted

in a particular layer tend to remain in that layer until thermal convection active during daytime breaks down the layering and mixes the pollutants uniformly through the depth of convection."

The flying laboratory probes as far afield as Ellisras, where at this time of year, it not only helps in the study of South African pollution but that from bush fires in Botswana, Zimbabwe and Zambia.

Mr Pearse said the rate of conversion to acid rain at this time of year (summer) was possibly higher than in winter because besides the presence of catalytic agents, such as dust, oxides and ultra-violet light, more moisture is present."

Escom's research encompasses pollution from all sources. It is hoped that in the near future its findings will be available to all people who have an input into the atmosphere.

LOW PROFILE KEPT ON THREAT OF INSECTICIDES IN MILK

Johannesburg THE CITIZEN in English 3 Nov 82 p 11

[Article by Keith Abendroth]

[Text]

THE authorities appear to be keeping a low profile on the possible threat posed by the discovery of traces of insecticide and antibiotics in certain milk and dairy products.

But it is learnt there is considerable concern at Government level, linked with determination to get to the root of the problem and eliminate it, keeping it in low key so as not to cause needless panic.

The Minister of Agriculture, Mr J J G Wentzel, first raised the subject two weeks ago when he opened the new National Co-operative Dairies complex at Heilbron.

He revealed that the appearance of antibiotics and insecticides in dairy products was giving cause for concern.

Later his own department heavily censored a report of his address when it was reported in the departmental newsletter.

Meanwhile it is learnt that the department has started a campaign to

alert farmers to the danger of insecticide traces in milk in quantities regarded as dangerous or above specified minimums.

Various tests have been done on samples by the SA Bureau of Standards and analysts of the Department of Health.

According to medical sources repeated small doses of one of the insecticides mentioned by Mr Wentzel (dieldrin) could build up in a human body to the point where later exposure to the poison in even a small dose could result in acute poisoning or even death.

In addition, according to doctors, repeated ingestion of small doses of antibiotics in milk could result in dangerous consequences through building up a resistance to antibiotics, making them ineffective if needed later as treatment.

Some antibiotics, it is claimed, could even cause blood disorders.

BRIEFS

CISKEI'S RAIN--THE first heavy showers of rain fell over the Ciskei and surrounding areas at the weekend bringing relief to farmers. Up to 40 mm of rain was measured in King William's Town. The nearby Maiden Dam is about 33 percent full and the steady flow of water will fill it today, a spokesman for the town's municipality said. A thanksgiving and prayer meeting for rain will be held in the town today. [Text] [Johannesburg THE CITIZEN in English 2 Nov 82 p 3]

PESTICIDE RESIDUES IN FOOD--SOUTH Africa is one of the few countries in the world where the incidence of pesticide residues in food was on the increase and causing a serious problem, the Minister of Agriculture, Mr Greyling Wentzel, said yesterday. Mr Wentzel, who made the disclosure during the opening of new dairy offices at Heilbron in the Free State yesterday, said the appearance of antibiotics and pesticide residues in milk and dairy products in particular was a cause for grave concern. He did not elaborate but announced that an intensive information and educational programme had recently been launched by the Department of Health and Welfare, in co-operation with his department, to try to combat the growing problem. Mr Wentzel appealed for the co-operation of dairy farmers and expressed the hope that the Government would not have to resort to "its considerable legislative powers". "In view of the dangers which the presence of antibiotics and pesticide residues in dairy products present to the entire population, the Department of Health and Welfare and the Department of Agriculture request the co-operation of all farmers to prevent the pollution of edible products on their property," Mr Wentzel said. He said this could be achieved by: --Not using prohibited poisons. --Adhering to instructions and correct withdrawal periods when administering antibiotics; and, --Adhering strictly to instructions and the recommended methods of application of pesticides. This was preferable to destroying milk and other food products polluted by prohibited substances or containing poisons above the approved levels, he added. Mr Wentzel said the public was aware that it was protected by legislation against food contaminated with antibiotics or residues of pesticides and relied on food producers to adhere to the regulations. The food producer could suffer economic setbacks if he lost the consumer's confidence and it was his responsibility to ensure that his product was safe, the Minister said. [Text] [Johannesburg RAND DAILY MAIL in English 21 Oct 82 p 2]

ZULULAND WATER RESTRICTIONS--Severe water restrictions have been reimposed in the Kwa-Mbonambi district, Zululand, despite a heavy rainfall last month. This had been necessary because the level in the local dam supplying the town had dropped drastically as a result of the scorching heat of the past few days. Virtually all SWA water storage dams would run dry by the middle of next year unless the coming rain season produced a considerable run-off in the catchment areas, the secretary of the Department of Water Affairs, Mr J Jordaan, said in an annual report. Rainfall over large areas of the territory had shown a steady decline since 1976 and dropped to its lowest point in the last rainy season. The water supply scheme for the Albany Coast Water Board which will supply the municipalities of Bushman's River Mouth and Kenton-on-Sea was opened yesterday by Mr J.W.E. Wiley, Deputy Minister of Environment and Fisheries. "Having now obtained an assured water supply, a system to distribute the water is but the beginning," Mr Wiley said. "The important thing is now to utilise these facilities to maximum benefit and to ensure that your underground water resources are adequately protected." In Natal, the cost of water over the past three months had gone up by 62 percent in Pietermaritzburg and 40 percent in Durban, Mr Roger Whiteley (NRP Durban Point) told the Natal Provincial Council yesterday--Citizen Reporter and Sapa [Text] [Johannesburg THE CITIZEN in English 18 Nov 82 p 11]

CSO: 5000/42

WORKERS' EXPOSURE TO TOXIC SUBSTANCES REPORTED

Harare THE SUNDAY MAIL in English 17 Oct 82 pp 1, 2

[Excerpt]

HUNDREDS of workers are being poisoned each year because they are being exposed to carcinogens and other toxic substances at work, the director of the Ministry of Labour and Social Services' Occupational Health, Safety and Compensation Department declared last week.

And, because of a lack of trained inspectors and the country's relatively sophisticated industrial infrastructure, the picture will not improve significantly soon, said Cde Rabelan Baloyi.

He told The Sunday Mail that ageing industrial equipment that causes pollution, and worker and management ignorance about job safety have resulted in more employees becoming victims of silicosis, asbestosis, lead poisoning, tuberculosis, fibrosis, leukaemia or cancer. Others were becoming deaf or hard of hearing.

Cde Baloyi said those who fail to wear protective clothing when they handle sulphuric or hydrochloric acids, chromium compounds, or engage in sand blasting are likely to suffer severe lung and other respiratory ailments.

"I know a number of chemicals that we handle in industry that can cause long-term problems," he

said. "It is true that there is a correlation between exposure to such chemicals and disease.

"But much still remains to be done in terms of looking for the specific causes. Sometimes these diseases occur long after the person is no longer working. Many of these diseases are respiratory.

"We need a study that would look at those who retire and then become ill, because in some cases people have no idea how they got the disease and often cannot even relate it to the workplace."

He said the Ministry of Labour and Social Services was considering rule changes that would require private sector employers to carry out pre-employment medical tests on job applicants. Employers would also be expected to conduct frequent medical checks on their employees to uncover job-related diseases.

"Right now it is very difficult to know how serious the problem is because we do not have all the data we need. We have approximately 100 reported asbestosis cases

and also several cases of industrial dermatoses.

"But these diseases take a long time to manifest themselves," Cde Baloyi said. "The trend with diseases such as asbestosis or cotton dust takes 10 to 20 years, or an average of 15 years, to be seen.

"Our overall problem though, is that there is no mechanism right now to show the origin of cancer, whether the cause is environmental or otherwise. Much still needs to be done in terms of looking for causes."

But steps are being taken. The Ministry of Labour and Social Services has acquired machinery that enables it to gather and monitor dust samples, gases and fumes in factories.

And because the country has a rather well-developed and diversified industrial base that means Zimbabwean workers come into contact with more hazardous chemicals than is the case in less-developed countries.

An additional problem is a lack of trained personnel to visit factories and advise employers and their managers on what steps to take to promote worker safety.

"We have an ignorant workforce in terms of knowing the hazards of exposure to toxic substances. We don't have exposure limits."

To attempt to reduce worker and management ignorance about toxic materials, Cde Baloyi said his agency has embarked on a preventative programme. This includes educating workers and employers about health and safety programmes by organising seminars, teach-ins, lectures and showing films.

"We want workers to realise that if they are not careful on the job they not only risk their pay-cheques but also their lives. So far the response has been fantastic. We are training about 1 000 people a month throughout the country on proper safety methods."

BRIEFS

CATTLE KILLED--BULAWAYO--OVER-GRAZING by peasant farmers in Matabeleland has laid bare more than 172 000 ha of land bought for resettlement and all communal areas and commercial farms bordering on them, but this has not stopped 50 000 cattle dying this winter so far, Government ministers said here last night. Cde Enos Chikowore of the Ministry of Local Government and Town Planning and Cde Moven Mahachi, the Minister of Lands, Resettlement and Rural Development and the Minister of Agriculture, Senator Denis Norman, were members of a team which has been touring parts of Matabeleland to assess damage left by hungry communal cattle this winter. Cde Chikowore and Cde Mahachi and several officials were in Gwanda yesterday, where discussions on the problems continued, ending with a visit to Hollins Block where the party was shown more evidence of the ravages of wandering communal stock. The 14 000 ha farm has been bought for resettlement, but in about two months cattle have overrun it, some coming from as far as 30 km away, the ministers were told. "No government can allow the land to be destroyed by over-grazing it to this point," Cde Chikowore said. The following are some of the facts that have come to light following the ministerial investigation: --Only 3 percent of communal cattle were sold this winter, against 25 percent from the commercial sector; --50 000 communal cattle have died because of the drought, with another 10 000 or more expected to die during the next three weeks; --The average stocking rate of each district in Matabeleland was about five times more than the land could carry; and --Only 15 to 20 percent of the rural population owned the greatest number of cattle. [Text] [Harare THE HERALD in English 22 Oct 82 p 1]

RAINS AT LAST--BULAWAYO--Heavy rains have fallen over most parts of Matabeleland with West Nicholson recording the highest 24-hour fall of 60 mm. A spokesman for the Meteorological Office in Bulawayo said that in the 24 hours up to 8 am yesterday, heavy rains had fallen in the south-western parts of Matabeleland from Victoria Falls down to West Nicholson. Bulawayo had recorded 49,5 mm. [Text] [Harare THE HERALD in English 19 Oct 82 p 1]

DROUGHT-STARVED CATTLE--GWERU--THE cold snap that came on Thursday will almost certainly cause widespread deaths among the drought-starved cattle in the Midlands, particularly in the communal areas, says the provincial officer of Agri-tex, Mr Bob Vaughan-Evans. "Deaths have already occurred and now these are expected to accelerate dramatically," he said on Friday. "I saw some awfully thin mombes on commercial farms in the Kwekwe area the other day--and that was in good conditions compared to the communal areas." Mr Vaughan-Evans said

plummeting temperatures and a lack of grazing came as a shock which the lean cattle could not take. What new grazing there was would cause them to purge badly. When this combined with cold weather and with trying to drop a calf then the cow was challenged beyond its capabilities. Mr Vaughan-Evans said the good rains that had fallen in the Midlands for nearly two weeks had brought a run-off in some of the dams. This would help, "but it will take quite a long time before they have any meaningful effect on the grazing". Communal area grazing, unlike gardens and lawns in the urban areas, did not just shoot up with the rains, for it was in such a depleted state. [Text] [Harare THE SUNDAY MAIL in English 24 Oct 82 p 1]

CSO: 5000/32

NEED FOR ECOLOGY SPECIALISTS STRESSED

Moscow MOSKOVSKAYA PRAVDA in Russian 17 Oct 82 p 2

[Article by E. Timofeyeva: "Who Will Be An Ecologist?"]

[Text] We continue the discussion of training specialists for environmental protection.

If you open any thick magazine or newspaper, or look at the book store shelves, you will be convinced once again how much is being written today about environmental protection, monitoring pollution, waste-technology and methods of purification.

There is no shortage of environmental protection recommendations. The question is who should introduce them? In other words, who in industry is obliged by obligation to "represent the interest of nature," and to be involved in purifying industrial effluent, discharges of gas into the atmosphere and so forth.

Our newspaper has already approached the problem of training applied ecologists in a higher school. Many specializations have appeared in recent years, which take into consideration to a certain measure the questions of environmental protection. But this is only a half step to the assigned goal.

Who is training the ecologist? The viewpoint dominates that the technical VUZ with its intensive educational program should not introduce new disciplines, and the course of environmental protection at best should be facultative, light, that is to say, for general development. The universities and biological departments of the VUZ's are obliged to train applied ecologists. But the biological department of the Moscow State University does not yet have an environmental protection section. If it did, the problem would still remain unresolved. The graduates of the university mainly go to science, and industry primarily needs these specialties.

Groups are being set up at the plants in the section of the chief technologist or the chief power engineer who sometimes are also called: "for environmental protection." The enthusiastic engineers in them are involved in monitoring the work of the treatment structures, introduction of foreign ideas and penetration of in-house original solutions. They have to reach all of this with their own mind, possibly, duplicating in some case what is already known. They do not have general ecological training. This results in inevitable costs.

Some VUZ's are trying to reduce the gap between the demand for applied ecologists and the supply, having created specialized departments for ecology. But there is still no well-proportioned, accurate, well thought-out system of training applied ecologists. The impression is created that each VUZ because of its understanding of the importance of the problem as well as the "penetrative" creative and other potentialities of the teachers build its own system of ecological "image base." At times they know what is being done in other educational institutions by hearsay.

Raising these questions in previous reports, the newspaper has noted that their solution primarily depends on the interested attitude of the sector ministries to the enterprises of the USSR Ministry of Higher and Specialized Education. An analysis is needed of the accumulated experience, precise system of training of specialists in such an important area as ecology.

Can applied ecologists be trained in technical VUZ's? The Moscow Lumber Engineering Institute (MLTI) attempted to answer this question. It developed a plan for continuous ecological training of students. They began studies with the new educational year. Foreseeing objections that this VUZ has started to teach ecology, I will say directly that the MLTI is strictly a technical institute, and only one department has a "biological slant", the department of forestry management. It is precisely the efforts of its colleagues in the VUZ which has resulted in practical implementation of the idea of mandatory ecological training of future engineers-technologists, economists, programmers who are faced with working in industries which are very difficult from the viewpoint of environmental protection, wood processing, paper and pulp, and sawmill.

The authors of the plan for continuous ecological training are professor A. I. Vorontsov and associate professor G. G. Martynov who did enormous work. They succeeded in introducing precise environmental protection aspects into each course taken by the students, even those who seem to be far from the problems of environmental protection of classic general educational subjects (heat engineering, physics), as well as special, taxation, automation of production, technology of wood working and so forth. These innovations are not perceived as something foreign. Ecological questions have not been introduced into them mechanically, but based on internal logic of the subject itself.

Say that the course "Economics of Industry" is given at the engineering-economic department. Now the topic "Determination of the Damage from Environmental Pollution in the Wood-Processing Industry" has been introduced into it. Here is another example. We are already concerned with the future production engineers, they are studying the technology of glue materials and slabs, and environmental aspects of its discipline is monitoring and control of industrial emissions of gas, dust, as well as harmful substances in the slab materials.

An excellent illustration of the ecological approach to strictly technical problems can be work conducted in the department of electronics and calculation equipment by associate professor B. Ye. Glasov. The very name of the study "Methods of Modeling and Use of a Computer to Create Forest Complexes" says little to the nonspecialist. At the same time we are concerned with things which are not indifferent for many of us--organization of completely new forms of management in which the forest is used not only as an object of consumption, but also as ecological, constantly renewing system

which requires protection, wise operation and care. It is precisely for this purpose that the scientists, mathematicians and physicists are attempting to model all the processes occurring in the forest, from accumulation of wood biomass, influence of solar energy on its growth to change in the leaves under the influence of gas content of the air. Only then can one predict the future of the forest, and this means, to predict and to prevent undesirable consequences.

Similar studies confirm once more the truth that ecological competence is necessary even for such people as electronic engineers if they are going to do their bit to solve biological tasks. As for the actual "natural" department in the MLTI, forestry management, here ecological training is given from the very first course. The department is the only one in the VUZ at which the 18-hour course "environmental protection" is among the mandatory.

It is no accident that the then quite new specialization, forest protection was introduced almost 10 years ago in the MLTI. In the narrow sense, these are biological, chemical and other forms of protection of the forest from diseases and death. But we well attempt to examine it more widely, as a single wide form of contact of man and nature which he is obliged to protect, and not to exhaust. Then it becomes obvious that operation of the forest, timely cutting for care and preservation of seedlings, all of this is not only and not so much technical problems as economic and ecological.

This is well understood at the department, from the dean, professor O. A. Kharin to the first class student who still has to pass 5 long years of studying and practice. By the way, practice at the department is mandatory work either in an educational forestry farm, or in a preserve, botanical gardens or forest park. Many student scientific experiments begin here. The students perform them generally on economic contracts concluded between the departments and industry. It is another matter that the further fate of this work, like some diploma projects is not always formed as the people involved would like. The MLTI transfers them for practical use to the forestry farms, preserves, the station of forest protection where they often then gather dust on the shelves.

This is yet another proof that the service of environmental protection in the forest farms, and at the enterprises must be done by specialist in the field of applied ecology. The graduates of the higher school do not yet have this recording in their diplomas. It should be.

9035

CS0: 5000/17

BRIEFS

LIMASSOL EROSION-PREVENTING MEASURES--We are informed that between Epikhosis and Enaerio (opposite GSO /expansion unknown/ and the Public Park) the first two jetties will be built on the basis of plans by an English expert to protect Limassol's shore from erosion. The Ministerial Council reached its decision on the construction of the two submerged jetties at its recent meeting (last Friday). As is known, the problem of Limassol shore erosion is an old one and has become worse the past 10 years following the Turkish invasion. Vertical jetties were constructed in the sea in the area of the hotel beaches which they protect but leave the rest of the shore exposed to erosion. Because of this fact and the repeated protests by the public and nature lovers, the government hired the British expert who has prepared a study for preventing the entire shore from eroding. The two jetties will be parallel and 80 meters from the shore and from each other. They will be submerged (will not be seen above the water's surface) allowing the water to move and be "aerated" in contrast with the present vertical ones where the water between them remains stagnant. [Excerpt] [Nicosia KHARAVGI in Greek 3 Nov 82 p 17 7520

GSO: 5000/4706

NEW ENVIRONMENT MINISTER CHRISTENSEN GIVES VIEWS

Copenhagen INFORMATION in Danish 3 Oct 82 p 6

[Article by Stig Albinus]

[Text] Chr. Christensen says that nature is a gift from God which has to be protected. In this article, he discusses nuclear power, sulphur, bird life, illegal building constructions, and Christiania.

The nonsocialist government's environment minister, Chr. Christensen of the Christian People's Party, will adhere to a "green line" in the environmental policy at the same time as he will work for the introduction of nuclear power in Denmark once the problems of the safety of reactors have been solved. Nuclear power may contribute to increasing the protection of nature and the environment because nuclear power limits the amount of pollution from energy consumption, Chr. Christensen says.

Here, the environment minister gives his views on the environmental policy and his tasks as environment minister.

It is no accident that Chr. Christensen has become environment minister. "Already in the past, when Paul Hartling attempted to change his narrow government into a four-leaf-clover government, did the Christian People's Party express its desire to get the post of environment minister."

A Gift From God

To the Christian People's Party, the interest in nature and the environment is a matter of primary importance. "We consider the nature that we have been given a gift from God. Nature is a gift which we have been given to administer in the right way. It must not be destroyed by pollution. This applies whether it is a question of the harmful smoke from chimneys, the poisonous discharges into lakes, streams, and the sea, or the problems of removing the chemicals which factories cannot themselves get rid of," Chr. Christensen says.

Chr. Christensen finds that the introduction of nuclear power will be a good thing because it will cause a reduction in the present rate of pollution from oil and coal.

"If nuclear reactors were safe, nuclear power is a cleaner and more pro-environmental source of energy than oil and coal. The burning of oil and coal today gives an enormous amount of pollution. If the problem of the safety of nuclear power becomes solved, we shall work for the introduction of nuclear power, but, in that case, the question will, of course, have to be decided in a referendum. However, it is clear that we take a positive view of nuclear power," Chr. Christensen says.

Safe About Barseback?

[Question] Do you feel safe about the location of Barseback?

[Answer] If they had known as much about nuclear power when deciding upon the location of Barseback as we do now, they would not have located it where it is now. There is no doubt about that. But now it is there.

One of my first tasks has been to compose the committee of three Danes who, together with three Swedes and one Norwegian as chairman, will be evaluating the risks of Barseback. Now they have to come up with a report on Barseback. They have got the period till November of 1983 to work in, and, till then, I shall not take a position on Barseback.

Sulphur Pollution

[Question] The sulphurous flue gas from chimneys pollutes the urban environment and causes an acidification of lakes. This gives in particular problems in Sweden where the soil, unlike the soil in Denmark, is not calcareous. Will you demand flue gas desulphurization?

[Answer] We have to pay great attention to the development which is taking place at present when, for commercial reasons, we have to utilize oil and coal. The burning of oil and coal results in an enormously high rate of pollution, as far as the amount of sulphur is concerned. The result of this is that lakes become acidified so that the vegetation and fish stocks become threatened, and it makes it difficult for trees to survive. Also urban areas are troubled by sulphurous fumes.

[Question] It is possible to install flue gas desulphurization equipment in chimneys. Will you be working for the introduction of such measures?

[Answer] I am very much aware that it is possible to install equipment which will prevent sulphur pollution, but it cannot be done without costing money.

[Question] Will you promise that you will be doing something to alleviate the problem of sulphur pollution?

[Answer] I can guarantee you that I will take the problem in hand. But I cannot say anything definite about what I will do. A so-called anti-acidification committee has been set up to work on the problem. I first want the recommendations of that committee.

Projecting Dike

[Question] Last year your predecessor, Erik Holst, was about to present a proposal to the effect that salt water be pumped into the area behind the projecting dike in North Schleswig seeing that the basis of existence for 100,000 birds has disappeared together with the salt water. Is this a matter which you intend to follow up?

[Answer] The fact that they made the projecting dike constituted a very serious interference in nature. Ornithologists in Denmark and Europe are very much interested in the matter and have pointed to the fact that the birds disappear when the salt water is pulled out. The ideas which have been presented of conveying the water into the area by way of some kind of irrigation system are very interesting. However, the security which has been created for the population thanks to the dike should not be jeopardized at the same time. The county of North Schleswig and the municipality of Højer have clearly rejected the idea of pumping salt water into the area. At the same time, there is disagreement on the number of birds threatened in the area on account of the dike.

The last time the proposal was dealt with, it was, moreover, a condition that the EC would promise to grant economic aid for the project. We did not get such promise. We shall now find out what the EC says, and we shall then have to contact the municipality and the county concerned.

Illegal Building Constructions

[Question] Will you as minister tolerate that the municipalities without penalty of the law permit illegal construction to take place?

[Answer] We are of the opinion that the two cases from Krik Cove and the Holte Center reflect a problem which it is difficult for us to live with. We have announced a bill under the group of 'possible' bills in the government's collection of bills to be presented in the Folketing. An investigation is being made, but we cannot yet say what the outcome will be.

[Question] Under the building construction legislation, only builders shall be liable to prosecution--not the approving authorities, municipalities and counties. Will you extend the liability to prosecution to include the supervising authorities?

[Answer] I cannot say anything on that yet.

[Question] There was also the possibility that the individual ministries would be checking that the municipalities and counties fulfill their duties of supervision?

[Answer] Well.

[Question] Which, on the other hand, might conflict with the autonomy of the municipalities?

[Answer] Exactly. But the matter is too serious to be left alone.

Cheminova

[Question] Is it reasonable for an enterprise such as Cheminova to be allowed to cause such an enormous amount of pollution with vast stores of poison without liability under the law?

[Answer] It is extremely important that the things which have happened in the case of Cheminova will not happen again with terrible effects in 10-15 years. The local chief constable has established that there is no legal basis for prosecution. Within this ministry, we are now working on the matter, and the Junior Counsel to the Prosecution is looking into the matter to see what can be done about it.

The problem is how to distribute the responsibility. A decision will shortly be made how to place the liability for the many millions of kroner which the damage caused by the pollution will cost. The outcome may be that part of the liability will be placed with Cheminova, part with the county and part with the state.

[Question] Have you considered extending the period of limitation in respect of environmental claims?

[Answer] We have not discussed the matter in detail. But, on the face of it, one wonders whether the 2 years are adequate.

[Question] That is to say that the period of limitation may be extended?

[Answer] No, you may not conclude that.

Citizens' Democracy

[Question] The new minister of the interior, Britta Schall Holberg (Liberal Party), stated recently that too much planning is taking place on the local level. Do you agree with her?

[Answer] I have discussed the matter with the minister of the interior. Both the minister of the interior and I agree to pay attention to the fact that provisions have been carried through under the municipal planning legislation which appear unreasonably restrictive. But, at the same time, we agree that the areas which belong under our different spheres will be safeguarded by the ministry concerned. (Municipal planning belongs under the Ministry of the Interior; editors).

[Question] Do you intend to limit the number of local plans, for example by relaxing the provisions governing the local planning obligations under the municipal planning legislation?

[Answer] We have just had a discussion with the National Union of Municipalities on the issue, and we have agreed to look further into it. There are

many examples of unreasonable local plans. For example, where a local plan is made because a bicycle path is being constructed where a road already exists.

[Question] Municipal politicians often express the desire for a change of the rules and regulations governing submission of matters to citizens, so that the possibility of submission becomes limited. Will you grant that wish?

[Answer] How long does it take applying democratic rules? There is no desire within this ministry to limit the influence of citizens. It is not a waste of time to involve citizens in the total course of the planning operation. It is my impression that the time initially involved in hearing the opinions of citizens on local or municipal plans is often made up for at a later point of time.

Involving citizens from the start often gives municipal boards an entirely different basis in their work. That is why the existing rules and regulations are quite beneficial to the municipalities. Citizens are given the possibility of becoming more involved in the municipal policy work. From a democratic point of view, this is certainly worth striving for.

Christiania

[Question] Is Christiania going to be vacated?

[Answer] We have never been able to accept the fact that people are living under such poor housing and sanitary conditions. There are also problems in Christiania in connection with narcotics abuse and the closed society, as far as children and young people are concerned. A modern society cannot allow these people to become socially destroyed. That was the background against which, together with other parties, we decided, in the past, that Christiania had to be closed down.

However, against our wish, the matter has now been thoroughly discussed back and forth in the Folketing, and the report of my predecessor has been adopted. Holst's report means that Christiania will be retained, and his report has been adopted by the same Folketing in which we now sit. We are obliged to respect that.

[Question] The way the Folketing is composed now, you will not take steps to liquidate Christiania?

Normalization

[Answer] Holst's report means that Christiania will be normalized, so that it becomes part of the general society. The laws applying to the society will also have to apply to Christiania. It is also an established fact that, as in all other parts of the country, the authorities will have to combat crime in Christiania and supervise the area. At the same time, buildings and installations will have to comply with the legal codes. We can take no further steps until we see how this normalization will proceed.

[Question] Politicians from the municipality of Copenhagen have pointed out that the said normalization has not been initiated?

[Answer] The reason is that they have not set up the committee which will be working on the matter and which will comprise representatives from different ministries and the organizations concerned. And that committee has not yet been set up because the question has not yet been clarified under which ministry Christiania belongs. The Ministry of the Environment is out of the picture, and we are now awaiting a move from the Ministry of Defense, which owns the area.

[Question] What will you do if the normalization aimed at in the report by Holst is not carried through? Will a new situation then exist?

[Answer] Indeed. That is absolutely certain.

[Question] If it turns out to be impossible to carry through a normalization of Christiania, will the previous report no longer apply?

[Answer] I shall merely conclude that a new situation then exists. But we are very anxious to learn what the reaction of the Ministry of Defense will be, Minister for the Environment Chr. Christensen concludes by saying.

7262

CSO: 5000/2514

PAPER: ENVIRONMENTALISTS SHOULD REALIZE ECONOMIC LIMITS

Copenhagen BERLINGSKE TIDENDE in Danish 1 Nov 82 p 8

[Editorial: "Environment in New Light"]

[Text] Denmark has got what is described as the world's best environmental legislation. If, in the opinion of some people, Denmark is so far ahead of other countries, it is due to the fact that the legislation gives far greater possibilities for environmentalists in Denmark than in other countries of protecting and safeguarding, of making demands and of demanding intervention. And nobody can claim that this legislation is not being utilized. Every single day, environmental issues are on the agenda everywhere in the society. Ten years ago, Jens Otto Krag appointed the first minister to head the anti-pollution efforts, and, since then, every government has had an environment minister, from whose department government officials seek to support and control the environmental development in all of its facets. The environmental policy encompasses a number of ministries and has become an important and demanding task to a government. The continued environmental debate is comprehensive and comprises major as well as minor issues. The new environment minister has already promised in the Folketing to seek to persuade his Italian colleague to give up plans for Italy to dump substances polluted with dioxine into the Atlantic. And, domestically, he has got more than enough on his hands.

Nobody will deny that working for the environment is a big and necessary task, nor that it is a task ranging from the physical planning of sociological developments to the problems associated with the daily life of the individual at his place of work as well as in his home. However, it is equally undeniable that much hysteries is connected with the environmental problems, and that a number of so-called environmental groups, which actively wish to fight for improvements, take advantage of the general positive attitude toward environmental protection to carry on campaigns the goals of which are actually of a political nature.

The environmental legislation is largely a legislation authorizing ministers to make decisions. It, therefore, is easy for pressure groups to make demands which affect the decisions to be made. It is a legislation and an administration developed in times of prosperity when everybody felt that there was money for everything. Therefore, big demands were made of the public sector--and thus also of the tax-payers--and big demands were made of the

trades and industries. Many enterprises have been involved in unreasonably heavy economic burdens to live up to the environmental regulations. Under the present trade conditions, there is no doubt that the environmental requirements have made it even more difficult for a number of enterprises to keep their costs at a level enabling them to compete with the products of other countries.

It is a good thing for environmental movements and also less active sections of the population to follow the developments controlled by the government and the Folketing. However, it is the duty of the new government in this interplay to convince the public that there are narrow limits to what the country can bear economically. The environmental demands may be so big that complying with them may be more harmful than beneficial. A society that is growing increasingly poorer cannot arrange matters as if it were a paradise.

7262

CSO: 5000/2515

ENVIRONMENT AGENCY STRESSES 'ACID RAIN' HARM IN ANNUAL REPORT

Copenhagen AKTUELT in Danish 28 Oct 82 p 18

[Text] Waste water containing sugar appears to be of major significance in the development of wound diseases in fish.

Off Nykøbing Falster and, to a smaller extent, in the waters off Assens, the bacteria grow rapidly when, during the sugar beet season, waste water containing sugar is discharged into the sea.

Researchers of the Environmental Protection Agency and the Royal Veterinary and Agricultural High School of Denmark have ascertained that there is a connection between the discharges of waste water containing sugar into the sea and wound diseases.

Wound diseases have thus been ascertained in 10-40 percent of the fish caught off Køge, Nykøbing Falster, and Assens. In all three places, waste water is discharged into the sea. Off Hundested, where the sea is relatively pure, wound diseases occur in only 1 percent of the fish.

From the annual report of the Environmental Protection Agency, which has just been published, it appears, however, that it is not a too simple matter to pinpoint the actual causes of the different wound diseases. Forty percent of the cod caught off Assens and 15 percent of the cod caught off Køge thus suffer from a certain cod disease although 50 percent less waste water is discharged into the sea off Assens than in Køge Bay.

The annual report also deals with fresh water pollution. The Fresh Water Laboratory of the Environmental Protection Agency has thus demonstrated an increasing rate of pollution in a number of lakes in two fairly small Jutland areas--one in Mid-Jutland south-west of Silkeborg, the other one in Thy south-west of Hanstholm. The acidification is due to the increasingly heavier acid rain of which Denmark is a net exporter and which is especially due to the burning of sulphurous coal and oil.

This form of pollution otherwise especially hits Swedish and Norwegian lakes, which, unlike most Danish lakes, do not have a chemical composition making them resistant to acidification. But in two Jutland areas, most of the life in the lakes is thus slowly dying out.

The authorities are in the process of finding out how to reduce Denmark's contribution to sulphur pollution. Together with the Ministry of the Environment, the Environmental Protection Agency will next year spend 2-3 million Danish kroner on these studies.

7262

CSO: 5000/2515

STUDY ESTIMATES COST OF KEEPING GROUND WATER SAFE FOR USE

Copenhagen BERLINGSKE TIDENDE in Danish 5 Nov 82 p 3

[Article by Kenneth Bo Jørgensen]

[Text] A total of 400 million kroner will be spent over the next 10 years to ensure that ground water, lakes and streams are not polluted by the chemical waste in the country's dumps.

This estimate was made by the Environmental Protection Agency on the basis of a nation-wide study comprising analyses by the various counties and the metropolitan area of 3,115 dumps which were in use between 1945 and 1976.

The study shows clearly that waste, containing chemicals, was discharged into 501 dumps. The result is that 19 dumps are now directly dangerous. However, these dumps are already well-known to the Environmental Protection Agency and are under supervision. Ninety-five other dumps are described as a definite threat to ground water, lakes and streams, and 226 dumps should, according to the Environmental Protection Agency, be examined thoroughly as soon as possible.

"At present, nobody runs the risk of poisoning by drinking water. But unless something is done very soon, there will be a risk," says Deputy Director of the Environmental Protection Agency M. Bundgaard-Nielsen.

"Especially in Denmark it is important to tackle the problem. We have a very high ground water quality, but, on the other hand, it is the only place from which we can get our drinking water as we have no big streams unlike other countries," says Kurt Overgaard, Master of Science, who is also from the Environmental Protection Agency, and he goes on to say:

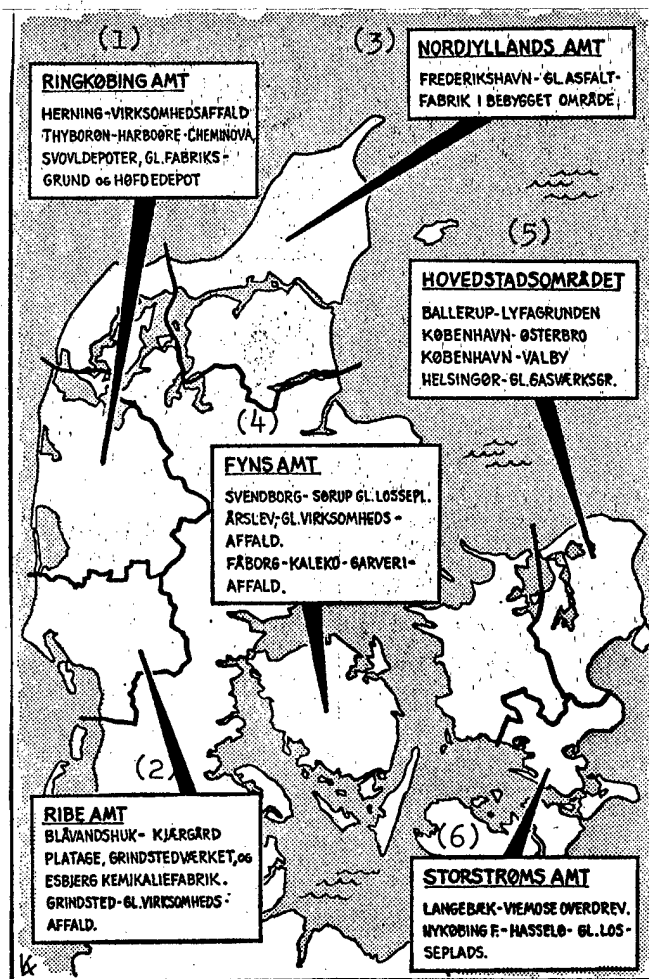
"If nothing is done now, we may risk later on having to spend 7-10 times as much on purifying the ground water, and it will after all never be possible to do it entirely effectively."

The Environmental Protection Agency will recommend to the environment minister that the costs be paid by the public sector. In the first instance.

"Otherwise, we would have to wait for a culprit, if any, to be found and held liable. That will take too long. Later on, we may bring suits against individuals in the courts to develop legal principles how to proceed against the culprits," says Deputy Director M. Bundgaard Nielsen.

The Environmental Protection Agency recommends that the costs be shared so that the counties pay 25 percent for further studies and planning of the necessary projects. The state will pay 50 percent for the very preventive measures, and the municipalities will be liable for the remaining 25 percent.

[See map and key on following page]



Here Are Denmark's 19 Most Dangerous Dumps

Key:

1. Ringkøbing County. Herning: Industrial Waste. Thyborøn-Harboøre: Cheminova, Sulphur Depots, Old Factory Sites, and Break-water Depot.
2. North Jutland County. Frederikshavn: Old Asphalt Factory in Built-up Area.
3. Ribe County. Blåvandshuk-Kjærgård Plantation, Grindsted Power Station, and Esbjerg Chemical Works. Grindsted: Old Industrial Waste.
4. Funen County. Svendborg-Sørup: Old Dump. Årslev: Old Industrial Waste. Fåborg-Kaleko: Waste from Tanning Industry.
5. Metropolitan Area. Ballerup: Lyfa Site. Copenhagen-Østerbro. Copenhagen-Valby. Elsinore: Old Glassworks Site.
6. Storstrøms County. Langebæk-Viemose Common. Nykøbing Falster-Hasselø: Old Dump.

TOUGH ENVIRONMENTAL MEASURES DEMANDED FOR ANKARA

Istanbul CUMHURIYET in Turkish 27 Oct 82 pp 1, 9

[Text] Ankara (CUMHURIYET BUREAU) -- Refet Erim, Prime Ministry undersecretary for the environment, said that the state was dedicated to the prevention of air pollution. "The citizen in Ankara will have to forego other necessities to find the money for high-quality oil and coal stoves," he said.

The Prime Ministry Undersecretariat for the Environment is coordinating Ankara's air pollution prevention program. Undersecretary Refet Erim asserted that all measures had been taken to supply Ankara with 175,000 tons of coking coal for the winter of 1983, adding:

"To date, 70,000-75,000 tons of coking coal have been brought to Ankara. Procurement and distribution of high-quality coal are ongoing and 40,000-45,000 tons of the coal are being sold to Ankara residents, while around 30,000-35,000 tons are now in storage. We find that sales have reached 1,000 tons a day."

Refet Erim said that citizens would not have the difficulty in obtaining coal that they have in previous years and added, "The citizen puts off buying coal because of economic constraints, but it would be better for his own sake to buy coal on time. If Ankara residents wait until winter to buy coal after it starts to snow, they will have to buy damp coal. That is, they will be paying for water and, at the same time, this coal does not burn well and causes air pollution. We would ask, for this reason, that the citizen forego other necessities and find the money for high-quality fuel and coal."

Erim then explained that Ankara was divided into zones and that zones 1 and 2 would be given priority in the distribution of coking coal. He said:

"Zone 1 consists of Kavaklidere, Kucukesat, Petekevleri, Seyranbaglari, Yenisehir, Kizilay, Sihhiye, Maltepe, Ulus, Cebeci, Bahcelievler and Emek. Zone 2 includes Cankaya, Gaziosmanpasa, Yukari Ayranci, Asagi Ayranci, Buyukesat, Incesu, Toprakli, Dikimevi, Demirlibahce, Altindag and Akkopru. However, should the existing number of stoves in these zones not be sufficient to consume all the coking coal allocated to Ankara, the coal will be supplied to other zones also. If coke utilization does not reach the desired level, we are considering supplying coke to citizens without coke ration cards as well."