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TRANSLATIONS ON ENVIRONMENTAL QUALITY
No. 172

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PEOPLE'S REPUBLIC OF CHINA

POLLUTED LAKES PURIFIED IN HUPEH

Peking NCNA in English 0741 GMT 18 Jul 78 OW

[Text] Wuhan, 18 Jul (HSINHUA)--The water in Duck Lake, Hupeh Province, is now clean again, with fish, shrimps and other aquatic creatures swimming in this formerly seriously polluted lake.

Duck Lake, on the southern bank of the Yangtze River in Ocheng County, is a big shallow water lake with 13 smaller lakes leading off it. With a water surface of some 7,000 hectares, the lake is one of the major fishery bases in Hupeh Province and is rich in fish, shrimps, lotus seeds and arrowroot. However, three chemical plants were built near the lake in 1959, and the lake became polluted with industrial waste water that drained into the lake. Fish and shrimps died and even the crops along the banks were affected.

The serious pollution of the lake drew the attention of the Hupeh Provincial Party Committee in 1976 and it set up an anti-pollution team backed up by 20,000 commune members.

Work was started in September on a programme drawn up by the Hupeh Institute of Aquabiology. Pipes were installed to drain the effluent to an oxidation pond, thus avoiding the use of water conservancy channels.

In the most serious polluted lake in the group, Yenchia, dams were built to carve off 200 hectares from the lake to make four oxidation ponds to purify the waste water using the action of the sea weed and bacteria. The water was then let out slowly from one oxidation pond into another and after it had passed through the fourth pond, it was sufficiently purified for fish breeding.

Last year 788,000 fish fry were bred from spawn in the Duck Lake fish farm, the survival rate being 80 percent. Some 8 months later, the 230,000 fish fry let out into the Yenchia Lake grew into 192,500 kilogrammes of fish, an output even greater than before the pollution problems.

The chemical plants are now working to speed up the treatment of waste water so that when these projects are completed, the Duck Lake water will be even more refined and the area of oxidation ponds will be cut down to leave more space for fish breeding.

EXPENDITURES PROJECTED FOR WATER POLLUTION CONTROL

Warsaw AURA in Polish No 6 Jun 78 p 1

[Text] In number 4/78, AURA featured an appraisal of the work of sewage treatment plants in Poland. Today we will contribute a few words on the theme of plans in the area of water conservation in the face of pollution this year and in coming years.

An estimated 4.4 billion zlotys, or 94 percent of the funds provided for in the plan, were used to fulfill the plan's water conservation goals in 1977. Incomplete fulfillment of goals occurred in the chemical industry, the food industry, foreign trade and maritime enterprises and the machine industry. The increase in capacity of sewage treatment plants last year amounted to more than 580,000 cubic meters per day on a base of 600,000 cubic meters per day, of which 55 percent was represented by biological purification plants.

The projected plan for 1978 includes capital expenditures for the construction of sewage treatment plants valued at 5,125,000 zlotys. Funds for national councils represent about 40 percent of the expenditures. As to material accomplishments, the projected plan calls for the transformation of 87 sewage treatment plants in 83 industrial installations with a combined capacity of 815,000 cubic meters per day. Forty-one installations will achieve a capacity of 481,000 cubic meters per day of biological treatment, while twenty-five city sewage treatment plants will have a capacity of 282,000 cubic meters per day. The combined projected growth in the capacity of sewage treatment plants will amount to 1,097,000 cubic meters per day in 1978. This will surpass the 1970 figure by 90 percent. This will result from a planned commitment to use many industrial purification plants over a long-term period of production. In the general growth in capacity put on line this year, there is a 60 percent increase in the biological purification plants' share.

Despite this year's growth (in relation to 1977) of capital expenditures for the construction of sewage treatment plants, in many installations and cities the management of water-sewage will, as before, require painstaking adjustments. Moreover, the 1978 plan does not assure proper funds for construction of municipal sewage treatment plants in localities already recognized as particular sore points from the point of view of requiring improvement in water quality. Among others this applies to treatment plants for these cities:

Puck, Wladyslawo, Jastarnia, Jurata, and other towns on the Hel Peninsula as well as Glucholazy, Nysa, Ilawa, and Cieszyn.

Decision number 128/75 of the Government Presidium pertaining to supplying the "Katowice" foundry with water from the lower section of the Przemsza River set goals for water usage. Although the decision stipulated that these goals be achieved in 1976-1978, they have not yet been fulfilled. Capital expenditures for the conservation of water in the "Polska" coal mine at Swietochlowicach, the Dzierzynski foundry at Dabrowa Gornicza, and the cities of Poreba, Bedzin, Piekary Slaskie, and Slawkow, are not included in the 1978 plan. A similar situation exists with regard to fulfillment of resolution Number 63/75 of the Council of Ministers in the matter of environmental protection goals in Katowice province. The 1978 plan does not include capital expenditures for the initiation of water conservation in the "Rymer" mine at Niedobczyce, the "Bobrek" foundry and the "Szombieri" power plant at Bytom, the oil refinery at Czechowice-Dziedzice and the cities of Blachownia and Klobuck.

Among other things, the Government Presidium's resolution Number 47/77 concerning fulfillment of resolutions passed by the Convention on Protecting the Marine Environment of the Baltic Sea Region calls for completion of water treatment plants for Wladyslawo in 1978-1981. However, capital investment for this was not included in the 1978 plan. The target date for the bringing on line of stations for collecting ballast water in the Northern Port, set for 1978, has to be deferred to the future. Likewise, the necessary concentration of capital for the maintenance of constructed water tanks, especially the Dobczyce tank, has not been maintained.

How does the promotion of the objective-financial plan for 1976-1978 shape up? In compliance with the water law, the responsibility for regulating sewage management applies to 1200 cities and industrial establishments. A growth in treatment plant capacity in 1976-1978 is forecast for almost 320 cities and industrial enterprises. The current 5-year plan establishes investment for water protection at 27.4 billion zlotys. It also calls for a 4.3 million cubic meters per day growth in capacity. The average yearly capital investment is 5.5 billion zlotys. Of this figure, 2 billion goes for local plans. Within the confines of the 5-year plan, 1976-1978 receives 13 billion or 48 percent. The planned increase in capacity of already on line treatment plants appears similar. The inadequate progress in fulfillment of planned investment is caused chiefly by the inadequate manufacturing capacity of the plants especially set up to meet this need. The greatest difficulties in the construction of municipal treatment plants exist in Katowice, Opole, Legnica, Jelenia Gora, Bielsko, Nowy Sacz and Warsaw provinces. If one refers to treatment by industry, difficulties exist in the food industry, light industry, forest products industry and the chemical industry.

In 1978-1980 the sum of 7.2 billion zlotys remains for our use. With this we must obtain a growth in sewage treatment plant capacity of 1.1 million cubic meters per day per year.

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EFFECTIVE METHODS NEEDED TO CONTROL POWER PLANT EMISSION

Warsaw AURA in Polish No 6, Jun 78 pp 18-19

[Text] In the current year the combined output of our power stations will increase almost 2,500 MW. The power industry is growing dynamically, and more and more will be spent for environmental protection. But one must not forget that together with megawatts, smoke stacks also increase. A power station's greatest damage is done to the atmosphere. In 1976 the department spent 230 million zlotys on air pollution control; in 1977-343 million zlotys; in the current year a sum of 625 million zlotys is called for. But the amount of pollution emitted from smoke stacks continually increases. In 1977 there was not only an increase in the absolute amount of pollution emitted, but also an increase in the ratio of pollution from 7.47 grams per KWH to 8.15 grams per KWH. One may suppose that this was a temporary increase caused by some kind of unfavorable circumstances, and that in the future this ratio will diminish. However, actually, we will have ever more polluted air until the time when power plants with coal burning boilers are no longer constructed.

A second, even more dangerous byproduct from combustion is sulphur dioxide which is usually not filtered out, since we do not possess devices for this. As a matter of fact, suitable installations exist in only a few countries such as the United States, Japan and West Germany. Although, comparatively, they are highly efficient, they are very expensive. Thus, in proportion to kilowatt hours generated and coal burned, the amount of sulphur dioxide emitted increased in 1975 by 1.37 million tons, and in 1977 by 1.53 million tons. Furthermore, the power industry receives a poorer and poorer quality of coal due to economic circumstances.

For the moment, the only means of reducing the damage which sulphur dioxide creates is, if possible, to disperse it in the air before it falls to earth. Very tall multiconducting chimneys, ranging from 300 to even 340 meters, serve this purpose. However, this method fails to protect the closeby surrounding area from a lethal concentration of poisonous gas. Even in the case of dilution we observe a partial destruction of vegetation, especially forest tree cover, in the entire many kilometer long belt extending around the chimneys.

In cases of particularly unfavorable atmospheric conditions, when the concentration of sulphur dioxide increases dangerously, power stations should use alternative fuels containing a very small percentage of sulphur. But this course is not followed for two reasons. First of all, it would be necessary to create special stockpiles of such fuel. Furthermore, a fairly significant amount of high grade coal would have to be set aside for this purpose. A network of monitoring stations which check current emissions exists around the majority of power stations. The enterprise "Energopomiar" continually works to improve the methods of monitoring the atmosphere. The question arises as to what is the aim of all this activity if one does not make direct use of the readings and the danger signs. Well, information gathering is necessary to design subsequent construction, moreover, it indicates the efficacy of using vacuum cleaning installations which signal a drop in the effectiveness of the removal of solid particles from gases.

Another method to prevent excessive concentration of sulphur dioxide would be to set production limitations for power stations in areas where unfavorable atmospheric conditions could arise. In addition to this, it would be necessary, correspondingly, to increase production in other plants. This is not done, also, because there is a lack of reserve power. Moreover, such transfers of electrical energy would require a substantial increase in the work of transport lines which would have to furnish a portion of coal at a greater distance. Finally, a third consideration is the loss of consigned energy.

Whatsoever the prospects of radical improvement are for the future, for the present the amount of sulphur dioxide emitted by power stations will constantly increase. The already mentioned enterprise, "Energopomiar," is conducting an examination of the departmental-company problem under the title "Environmental protection against the negative effects of energy industry activity." Energopomiar has already produced a dry ammoniacal alternative method of neutralizing dangerous gas. Admittedly this is not suitable for permanent use, but it will be possible to prevent an increase in the danger during unfavorable weather. Furthermore, Energopomiar developed an industrial installation to desulphurize fumes in a wet limestone process adapted to continuous work. A small experimental station of this type began to operate this year at the Halemba power station. After 1980, if favorable results are obtained, perhaps all enterprises will be equipped with such a device. However, the unsolved problem of disposing of significant amounts of waste created by this process still exists.

A future solution which is being worked upon is a boiler for coal consumption in a fluid deposit where a convergence of sulphur in a nongaseous union takes place. An even more advanced method would be to heat boilers by gas, completely cleared of sulphur, created from the process of gasification of coal underground. The Mining Institute is now working on this project. However, even if it succeeds in mastering the difficulties such a project presents, the fruits of its labors will first be utilized by the chemical industry. The power industry will acquire the process at a later date. Without question, by the time that this would be possible--certainly not for a few decades--mankind in general will abandon a power industry based on the combustion of mined fuel because of the threat to the atmosphere caused by excessive increases in the amount of carbon dioxide. Unless there is discovered a still better method to conserve energy, at that time it will be possible to build

only atomic and magnetic-hydrodynamic power stations now found in scientific labs.

The power industry, to a significantly greater degree, negatively influences the state of the air than it does the state of the water. New power plants are equipped with closed water cooling systems in which only evaporation is the only complete loss. However, in several older plants the discharge of the water used for cooling creates a threat to rivers. This is because the drainage water, although as a rule clear of sewage, is hot as it drains out. In addition to a significant amount of heat, the draining water sometimes contains oil and grease--from leaks or from damage caused by accidents--which pollutes the water. Modernization of the old structures includes closed cooling systems, but these changes take place slowly due to their high cost. Expenditures on this totaled 48 million in 1976, 76 million in 1977 and are set at 80 million for this year. These sums pertain only to the modernization of installations as they affect the protection of rivers. The general sums for the modernization of water management, amounting to hundreds of millions yearly, are significantly higher. With the aim of preventing the destruction of river flora and fauna the introduction of closed circuits for the time being harmonizes with supplementary methods such as cooling water in temporary reservoirs. Research is also being carried out on the possibility of accelerating the cooling process by splashing the liquid with special devices. Research is also being undertaken on the utilization of waste water for intensive, year around fish cultivation.

Permanent wastes create the next problem. Last year power plants discharged 16.4 million tons of cinders, slag and dust trapped in smoke stacks. Of this figure, about 50 percent was put into productive use. Of this 50 percent figure, some 20 percent was used in the production of cellular concrete, 12.4 percent on the production of cement, 33 percent on the needs of the power industry and 10.6 percent on the road construction. These secondary raw materials can certainly be completely utilized. However, this requires the initiative of other departments, especially the construction industry, agriculture, forestry and the chemical industry.

Transporting these volatile substances, which even a weak wind can scatter thereby producing an environmental threat, presents difficulties. The power industry earmarks a considerable sum for the installation of pneumatic ash reducers and the consignment of cinders to retention tanks. But the method of transporting dry dust to consignees has not been resolved. Also, except for power stations there are no devices for loading and unloading dry ash.

Those cinders not recycled are thrown out on a dumping ground which now occupy 1,630 hectares. This year 23 hectares have been recultivated. For several years "Energoprojekt" has conducted research and attempts at biological methods to prevent flying dust particles, and the results are being used by the newly created Enterprise for Making Power Plant Waste Productive. In 1973 the first crops, chiefly grain, grown on power station residue were harvested at Skawina, Blachowni and Konina.

The war against noise also runs its course with a varying degree of success. A certain improvement in workers' use of personal hearing protection is noted. But many workers still use earflaps reluctantly. Several power plants have, on their own, produced soundproof cubicles. But a lack of skilled workers and manufacturing capacity prevents the equipping of every building. The power industry already needs 320 such rooms, and, unfortunately, no one wants to undertake this construction. After all, one must treat the rooms as a necessity until the time the machine industry begins to furnish installations which are noiseless and do not cause excessive vibrations, as called for by the provisions of the 1971 Council of Ministers' resolution.

So much for internal noise. Environmental protection in the face of external noise appears to be in better shape because mufflers which effectively reduce the whistle accompanying the escape of steam from safety valves are in use.

In recapitulation, it is fitting to state that in spending colossal sums on energy construction, we skimp on outlays and personnel for necessary capital investment for environmental protection. In the absence of criteria, we include only perceptible material costs for estimating losses incurred due to air and water pollution. As a result of this, we conclude that it's better to pay to build the next energy complex than to provide existing complexes with indispensable pollution control devices. It is true that power stations, especially heat and power generating plants supplying electrical energy, water vapor and hot water for industry and municipalities, have replaced a great number of inefficient, uneconomical and polluting furnaces and boilers. In that case, their very existence improves the state of the air. However, one cannot consider this a convincing argument for limiting other operations on behalf of environmental protection.

Meanwhile, not everyone agrees with this analysis. Although there has been great progress, perhaps our awareness of the consequences of economic activity on the biosphere is still a little too underdeveloped. Each new power station project has a separate part dealing with environmental protection. One observes an ever greater concern with the correct utilization of environmental protection devices. There is even a new awareness of the need to protect the landscape.

The fact that three institutes busy themselves with scientific-experimental work in the environmental protection area fills one with hope. These institutes are: "Energoprojekt," "Energopomiar" and the Energy Institute. Their activity prepares the basis for undertakings which will make possible the reduction of dangers to the biosphere. For example, although the plan does not yet call for capital expenditure in this area, there has already been an inquiry into the effects of high-tension lines, carrying 750 kilovolts, on the environment. It's good that science is outstripping economic actions. It seems that already today we should also know how many coal-fueled power stations can be built in Poland from the ecological point of view, where to locate them and what kind of fuel to utilize in order to limit damage to a minimum.

YUGOSLAVIA

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STATISTICAL ANALYSIS OF PHOTOCHEMICAL POLLUTION DATA FOR ZAGREB

Zagreb KEMIJA U INDUSTRIJI in Serbo-Croatian Apr 78 pp 177-181

[Article by Z. Bozicevic* et al., Rudjer Boskovic Institute, Zagreb; submitted 5 December 1977]

[Text] Under the effect of solar radiation a series of photochemical reactions brings about creation of so-called photochemical smog in air containing relatively high concentrations of pollutants such as hydrocarbons and

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nitrogen oxides [1, 2]. In addition to reducing visibility and spoiling the city's appearance, this form of pollution causes direct damage to exposed surfaces of any natural and man-made materials through its oxidizing effect [3]. Certain plants such as tobacco, tomatoes and lettuce, and the mucous membranes of animals and humans are especially sensitive to this oxidizing effect. Irritation of the eyes in the atmosphere of Los Angeles is already well known, as are the stifling fogs of London in the fifties.

There have already been warnings that photochemical pollution of the atmosphere of Zagreb is not negligible [4]. Between May and September 1957 and continuously thereafter the concentration of ozone by volume has been measured in the air in the center of the city of Zagreb on the roof of a building 65 meters high. The measurement procedure has been described in detail previously [5], and certain results have already been published [5, 6]. The need for careful and systematic study of photochemical pollution in Zagreb was pointed up even without a very detailed analysis of the values measured. Toward that end all the measured values have now been statistically analyzed, and the influence of meteorological factors accessible to us has been studied.

In the period from 1 May to 30 September 1975 1-hour averages of ozone concentrations by volume were measured for a total of 3,310 hours. The average daily variation of the ozone volume concentration in the air is shown in Figure 1a. Deviations from the average values are relatively large, as can be seen from the plots of the indicated standard deviations, which is not surprising for measurements done in the open air. Minimum volume concentrations of ozone in the city's atmosphere are reached about 0700 hours, when pollutants emitted in the morning traffic break down a large portion of the ozone present. After 0700 hours, as radiation becomes increasingly intense, ozone is created [2]. Maximum volume concentrations are achieved about 1300 hours and are maintained until 1700 hours, when the processes of ozone decomposition again begin to be dominant because of the absence of radiation.

The distribution of the frequency of 1-hour averages of ozone volume concentrations given in Figure 2 shows that the values are distributed approximately according to the Gaussian law (curve) with a mean value of 41 ppb and a standard deviation of 24 ppb.

Normal logarithmic distribution, which is thought to best portray the distribution of pollutant concentrations in urban areas [7], does not yield such good agreement (Figure 3) with the results of measurements. However, the figures do not conform with sufficient accuracy any one distribution so that the chi-square test might be used.

The meteorological data accessible to us were the hourly averages for temperature, wind speed and direction, hourly averages for solar radiation, and precipitation times and amounts.

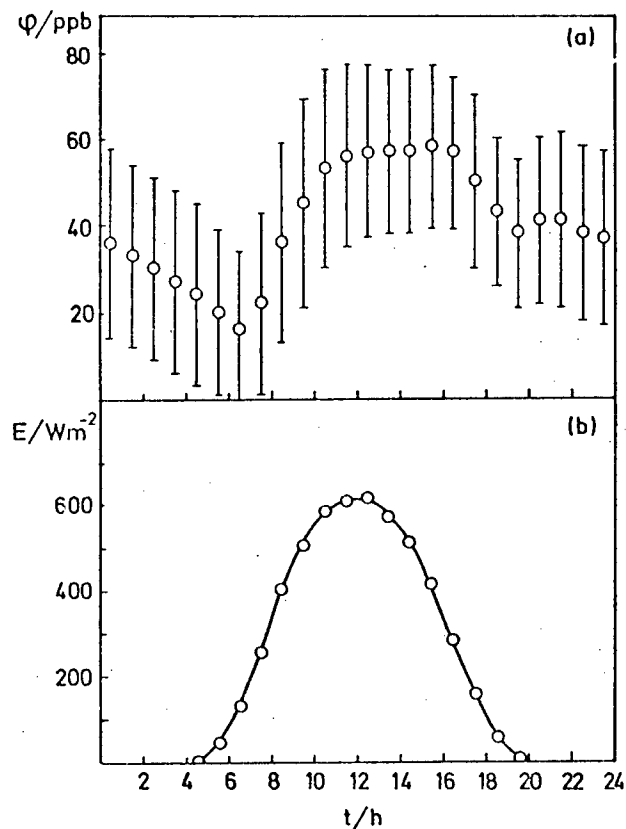


Figure 1. Average daily variation of ozone volume concentration in the air and solar radiation in Zagreb over the period from 1 May to 30 September 1975. (a) Average values of ozone volume concentration ϕ (circles) in parts per billion (ppb) $\pm$ the standard deviation (lines); (b) average hourly values for global radiation E in watts per square meter. The abscissa shows the time t in hours.

Creation of ozone in an urban atmosphere with elevated concentrations of pollutants such as hydrocarbons and nitrogen oxides depends primarily on the incident solar radiation. It was therefore of interest to examine the correlation between ozone volume concentrations (ϕ) and figures on radiant energy (E). As a secondary pollutant, ozone occurs only at a certain interval following the primary photochemical process, i.e., photodissociation of NO_2 molecules under the influence of solar radiation. The maximums on the curves showing the average daily variation of the ozone volume concentration (Figure 1a) and radiant energy (Figure 1b) are therefore separated by a shift. This shift can also be seen in the correlation coefficients. If we take all the values of ozone volume concentrations and radiant energy between 0600 and 1900 hours, the correlation coefficient we obtain is $r_{E\phi} = 0.57$. An essentially better correlation is achieved when ozone volume concentrations from 0600 to 1900 hours are correlated to radiant energy between

0500 and 1800 hours, i.e., when ozone's appearance at the measurement site only about 1 hour following the primary photochemical process is taken into account. Then the correlation coefficient is $r_{E\phi} = 0.70$.

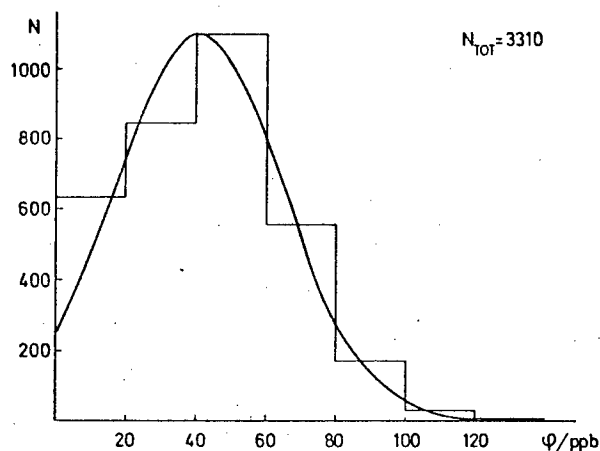


Figure 2. Experimental distribution of the frequency of ozone volume concentrations ϕ in the air compared to the normal distribution curve.

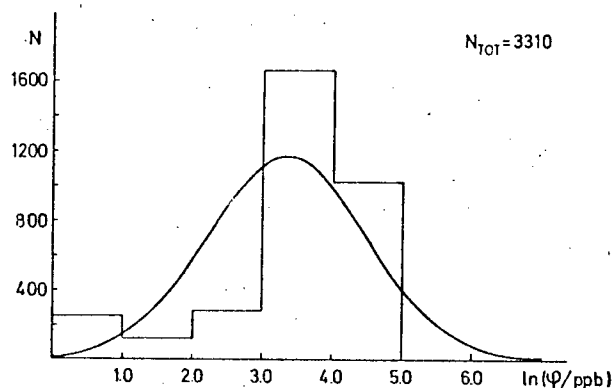


Figure 3. Experimental distribution of the frequency of the logarithm of ozone volume concentrations ϕ in the air compared to the curve for normal logarithmic distribution.

If we examine only the rise of the ozone volume concentration in the air, i.e., the values between 0700 and 1300 hours, the correlation coefficient with values for radiant energy between 0600 and 1200 hours is $r_{E\phi} = 0.74$. It was of interest to us to find how this correlation was affected by rainy weather and wind. We therefore first omitted all hours when it was raining, which yielded $r_{E\phi}(-k) = 0.746$. When all hours in which wind speed was higher than 2 ms^{-1} were admitted, we obtained $r_{E\phi}(-v) = 0.749$. The highest correlation coefficient $r_{E\phi}(-kv) = 0.77$ was obtained when all rainy and windy ($v \geq 2 \text{ ms}^{-1}$) hours were omitted.

In a comparison with laboratory measurements the correlation coefficients obtained were low, so that the interpretation of correlations was not highly reliable. To give an idea how much the correlation coefficients $r_{E\phi}$ varied, correlations were studied for particular months. The values obtained are compared in Table 1.

The best correlation was obtained for August, and the weakest for June. It is relatively difficult to find the reason for this fact. A comparison of wind data does not yield any very obvious conclusion.

Table 1. Correlation Coefficients for 1-Hour Mean Ozone Volume Concentrations (ϕ) Between 0700 and 1300 Hours With Radiant Energy (E) Between 0600 and 1200 Hours

<u>Period</u>	<u>$r_{E\phi}$</u>	<u>$r_{E^x\phi}$</u>	<u>$S_h/^{\circ}\text{C}$</u>
May 1975	0.69	0.73	3.0
June 1975	0.68	0.70	3.8
July 1975	0.74	0.75	3.1
August 1975	0.83	0.88	1.9
September 1975	0.82	0.83	2.4
1 May-30 September 1975	0.74	0.77	3.3

$r_{E\phi}$ correlation coefficient for all values

$r_{E^x\phi}$ correlation coefficient when rainy and windy ($v \geq 2 \text{ ms}^{-1}$) hours are omitted

$\overline{S_h}$ mean hourly standard deviation of the temperature over a 24-hour period

Nor did the average daily variation of the temperature differ essentially between those two months (Figure 4). Yet there is a striking difference in the standard deviations (S_h) for 1-hour temperature averages at various times of the day. Minor departures from the mean temperature in August indicate a certain stability of the weather, so that the correlation of the ozone volume concentration with radiant energy was better than when the deviations from the mean temperatures were greater. For the sake of comparison mean standard deviations of the temperature on average days in various periods ($S_h = 1/24 \sum S_h$) are given in Table 1.

The same procedure as with rain and wind speed was taken in order to study the influence of wind direction. Hours were successively omitted when the wind blew from the northeast, southeast, southwest and northwest. The greatest change in the correlation coefficient (-0.04) was obtained when southeast winds were omitted. Nor is this so surprising when we take into account that the major part of Zagreb's industry is located in the southeastern section of the city. In and of itself the change in the correlation coefficient does not say much, since it does not show what values are associated with a particular wind. A change in the slope of the regression line obtained by the method of least squares of the deviation in the

ordinate, which is -12 percent, and of a segment along the ordinate axis (ϕ), which is +24 percent, suggests that high ozone volume concentrations are predominantly associated with a southeast wind.

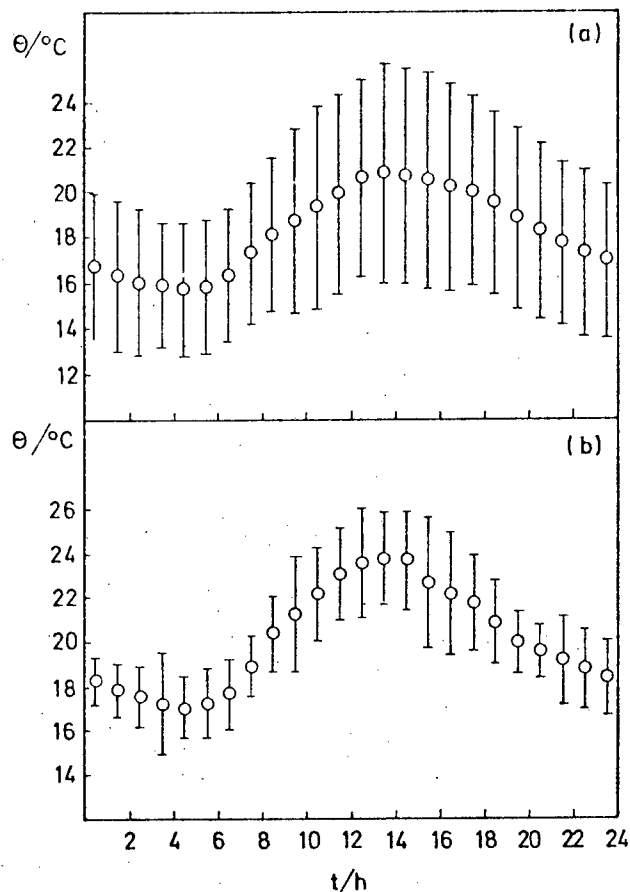


Figure 4. Average daily variation of air temperature for (a) June and (b) August 1975 and accompanying standard deviations S_h .

A more detailed analysis reveals that 73 percent of the values exceeding the American air quality standard of 80 ppb are associated with a southeast wind, that is, with air from the city's industrial area. Thus there is no doubt that along with motor vehicle traffic, industry is the principal reason for the creation of photochemical smog in Zagreb.

It is interesting in this context to study the suitability of industrial location as well. The wind rose for the period from 1 May to 30 September 1975 (Figure 5a) shows that most of the winds blow from the northeast (37 percent), which is followed by 20 percent from the southeast, 25 percent from the southwest and 18 percent from the northwest. If we look only at the period when the ozone volume concentration in the air is rising, i.e., between 0700 and 1300 hours, we arrive at the interesting conclusion that in that period, which certainly corresponds to the maximum activity of industry, most of the winds (35 percent) blow from the southeast, carrying polluted air from the industrial area into the center of the city, while 32 percent blow from the northeast, 25 percent from the southwest and 6 percent

from the northwest. We can conclude on the basis of these results that from the standpoint of photochemical pollution the location of Zagreb's industry is as adverse as it could be. This is an important realization which has not been taken into account up to now, but which certainly ought to be taken into account in Zagreb's future industrial development.

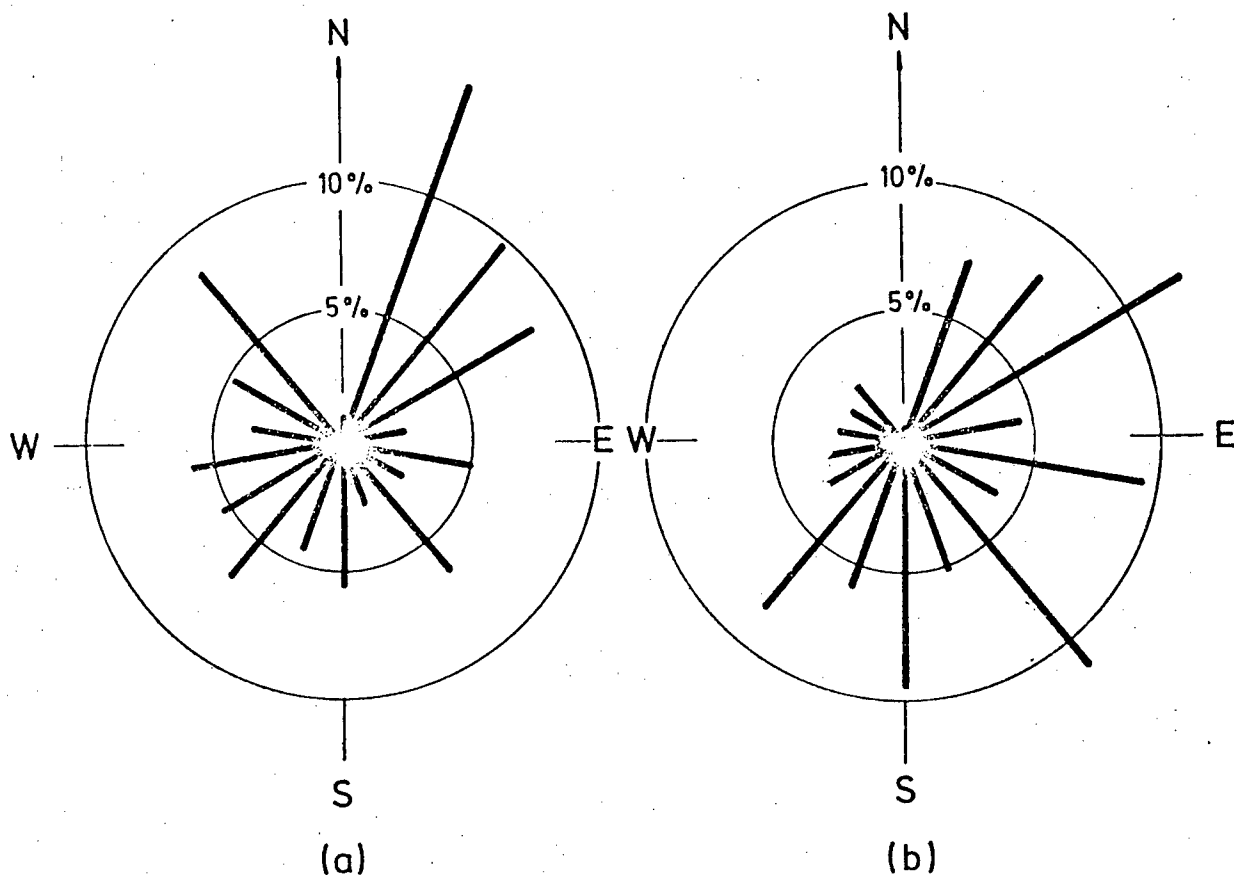


Figure 5. Wind roses for the period from 1 May to 30 September 1975 (a) all values from 0000 to 2400 hours, (b) values from 0700 to 1300 hours.

The concentrations of oxidants which occur through the action of solar radiation on the primary pollutants in the open atmosphere regularly reach their maximum tens of kilometers from the source [8-10]. We can thus expect that there will be essentially higher ozone volume concentration on the north-western edge of the city and that in that area the harmful effect, especially to vegetation, will be greatest.

In the light of similar research done elsewhere in the world [11-13] it was of interest to examine the difference between workdays (Monday through Friday) and Sundays and holidays. A comparison of quantiles in what is called a quantile-quantile diagram [14, 11] shows that the differences are not great

and that on Sundays and holidays oxidants attain somewhat higher concentrations. In view of the relatively small number of days (26 Sundays and holidays, 105 workdays) random differences in weather probably have too great an effect to allow a quantitative conclusion to be drawn. It is interesting to compare correlations with the figures for radiant energy separately for workdays and holidays. On workdays, when we can assume higher pollution, the correlation coefficient for 1,271 values of ozone volume concentration between 0600 and 1900 hours with radiant energy between 0500 and 1800 hours was 0.74, while on holidays (339 values) it was only 0.55. Better correlation is obviously achieved when atmospheric pollution is higher.

A comparison of the values for ozone volume concentrations during and after rainfall leads us to the conclusion that the effect of evaporation is not itself essential and that it can be separated from the change in intensity of solar radiation associated with the accompanying cloudiness.

One datum which might be directly associated with the intensity of photochemical pollution in the city is visibility over the city. These data are unfortunately not determined reliably enough in Zagreb so that they might be used.

Aside from meteorological data, we certainly should gather as soon as possible data on quantities of pollutants and emission values of pollutants such as nitrogen oxides and reactive hydrocarbons. It is clear that in our time essentially more effort and money should be spent to study the factors affecting the creation and spread of pollution in order to protect environmental quality.

Note of Gratitude

This work was financed with funds from the Second Self-Managed Special-Interest Community for Science of the Socialist Republic of Croatia. Equipment for measurement of ozone in the air was the gift of the government of West Germany under the Agreement on Bilateral Cultural and Scientific Cooperation With Yugoslavia.

On this occasion we express our gratitude to a number of work organizations and individuals without whose unselfish aid and understanding it would have been difficult to perform this research. This particularly applies to the work organization OKI [Organic Chemical Industry], Splendid, INKO [wholesale and retail firm] and the Medical Research Institute in Zagreb, as well as Dr H. Guesten (Kernforschungszentrum, Karlsruhe) for numerous pieces of valuable advice, Dr I. Penzar (School of Natural Sciences and Mathematics, Zagreb) for meteorological data, Dr M. Fugas (Medical Research Institute, Zagreb) for useful discussions and Engineer Z. Jagaric (OKI--Zagreb) for aid and technical advice.

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7045

CSO: 5000

COMMERCE MINISTER EXPLAINS COUNTRY'S WHALING POSITION

Panama City LA ESTRELLA DE PANAMA in Spanish 30 Jun 78 pp 1, 43 PA

[Letter from Commerce Minister Julio e Sosa to Juan Carlos Duque, director, LA ESTRELLA DE PANAMA, dated 28 June 1978]

[Text] Dear Mr Director: In view of the fact that confusing reports have been published, both locally and abroad, regarding the Panamanian position at the annual meeting of the International Whaling Commission, I wish to clarify a number of matters in this regard.

The government of Panama, in view of its interest in conserving natural resources, some weeks ago requested that the imposition of a moratorium or total ban on whaling for a period of 10 years be included on the agenda of the annual meeting of the International Whaling Commission. However, after the measure was considered more carefully, it was concluded that the measure would have effects contrary to those pursued by conservationists for the following reasons:

1. The principal nations involved in whaling, particularly Russia and Japan, would withdraw from the commission if the measure were approved and would continue whaling freely and without controls, with the resulting extinction of the whales.
2. Whaling nations which are not members of the commission presently do not observe measures to protect the species. Obviously, if the moratorium were decreed, those nations would not only continue their indiscriminate whaling, but would also increase these activities upon being able to purchase cheap fleets from the countries that would be barred from whaling if they honored the commission's recommendations. Our objective must be to strengthen the commission, attracting the other countries into it by demonstrating that its decisions are impartial and based on the available scientific information. Only by the participation of all countries will conservationist goals be achieved.
3. At present, six species of whale are included under a total moratorium for an indefinite period and the other four are subject to low

quotas which guarantee the replenishment of the population. Our country seeks to keep those quotas as low as possible and to estimate the current whale population as conservatively as possible.

4. Scientific studies have revealed that there has been an increase in the population of the various species of whale, thus averting the danger of extinction.

5. The moratorium is not a simple matter, since some species grow and reproduce more rapidly than others, and there is the danger that they may displace the others in competing for space and food. Similarly, the abundance of older specimens leads to a high mortality rate among the younger specimens for the same reason, which runs contrary to the desires of conservationist groups.

For the aforementioned reasons, our country, at the beginning of the annual meeting of the Whaling Commission when the preliminary agenda was being considered, requested that the proposed moratorium be withdrawn from the agenda.

However, we are concerned about the references made in local newspapers to the danger of losing our sugar quota in Japan if Panama maintains its position with regard to the moratorium.

Such statements not only demonstrate a total ignorance of the subject matter--since Panama does not have a sugar quota with Japan, has never sold a single pound of sugar to Japan and has never even considered selling sugar to that country because of the high cost of shipping--but also undermine the dignity with which the Commerce Ministry has always defended the national interests.

I hope that these few lines will serve to clear up a matter which, because it is complex and emotional, lends itself to confusion.

Attentively,

[Signed] Julio E. Sosa B., minister of commerce and industry

CSO: 5000

BRIEFS

INDUSTRIAL POLLUTION MONITORING--Jiddah, 30 June--The Kingdom is planning systems to monitor pollution at Jubail and Yanbu, 'Al-Jazira newspaper reported Friday. The Meteorological Department of the Ministry of Defense and Aviation will cooperate with the Royal Commission for Jubail and Yanbu to develop systems to control the harmful effects of industrial waste from the complexes planned for the two towns, the newspaper reported. Several meetings have been held already on principles for the development of the air, sea and land systems and on training programs for their management and maintenance by Saudis. The department also has an ongoing joint program with the University of Petroleum and Minerals in Dhahran to identify environmental hazard in the Eastern Province. According to 'Al-Jazira, the department is working on the development of an automatic wireless network for the reception of meteorological data from manned and unmanned stations. This will have special application for the development of the environment, the paper said. The department also is planning great automation and increased use of computer capacity in weather forecasting, following instructions from Deputy Defense Minister Prince Turki to the department to upgrade all its equipment. The newspaper said that the department is also considering cooperation with the U.S. National Aeronautic and Space Agency (NASA) to study thermal balance in the various regions of Saudi Arabia.

[Text] [Jiddah ARAB NEWS in English 1 Jul 78 p 4]

DETAILS ON TREE PLANTING CAMPAIGN

Campaign in Gondar

Addis Ababa THE ETHIOPIAN HERALD in English 18 Jun 78 p 6

[Text]

G O N D A R (ENA) — A total of 3,053,820 tree-seedlings of different varieties will be planted in Gondar region, it was disclosed by the head of the regional office of the Forestry and Wildlife Conservation and Development Agency.

The planting of the trees will be conducted by workers of the branch office of the Ministry of Agriculture and Settlement, peasants' and urban dwellers' association members and employees of municipalities and the branch office of the Forestry and Wildlife Conservation and Development Agency.

It is known that a total of 80 hectares of land in four provinces of the region, will be afforested. The head of the regional office of the Forestry and Wildlife Conservation and Development Agency urged government and mass organizations to co-operate effectively in the venture.

Planting in Gojjam Region

Addis Ababa THE ETHIOPIAN HERALD in English 30 Jun 78 p 3

[Text]

DEBRE MARKOS (ENA) — A total of 2,139,040 seedlings of different trees are to be planted in Gojjam region this year by the Forestry and Wild-life Development and Conservation branch office there, it was disclosed.

According to the plan of the office to improve Forestry and Wild-life Development and Conservation, 13 types of seedlings of different trees have been prepared in ten seedling stations, in seven provinces, in the region. There were eight seedling stations last year.

A total of 232,935 seedlings near Lumame town in Debre Markos province, 517,622 in the vicinity of Deber Markos, same province, 420,896 in Enjibara town of Agew Mider province, 79,107 at Jankara, same province, 166,140 at Gilgel Abay in Bahr Dar province, 218,616 near Finote Selam town, of Kola Daga Damot province, 68,700 near Mota town of Mota province, 111,000 at Gudeweyin of Mota province, 211,747 near the old Bichena town of Bichena province, 112,277 near Chagne town of Metekel province, have been prepared for this year's plantation according to Ato Kasahun Workneh, chief of the regional Forestry and Wild-life Development and Conservation office.

Some 25,000 seedlings are to be planted on 10.7 hectares of land. A total of 175,000 seedlings are to be planted on 75 hectares. The sites for planting the seedlings are being dug by urban dwellers' and peasants' associations and by students and teachers, it was further learnt.

Reforestation in Debre Gelan

Addis Ababa THE ETHIOPIAN HERALD in English 4 Jul 78 p 3

[Text]

Over 70 members of the nine discussion forums in the Ministry of Information and National Guidance Sunday undertook the first of a series of afforestation campaigns in the Debre Gelan area of Akaki Beseka district southeast of Addis Ababa.

The campaign is part of a continuing programme being initiated in cooperation with the Forestry and Wildlife Conservation and Development Authority and intended to make afforestation an on-going venture throughout the country. The organizers of the programme appreciate the role of forests in the national economy

as well as the drastically adverse consequences of deforestation.

Only three per cent of Ethiopian land surface is now covered with forests compared to 37 per cent only a few generations ago, it is pointed out, and the situation could further deteriorate unless appropriate measures are taken to arrest the trend.

The Forestry and Wildlife Conservation and Development Authority has in the meantime appealed to peasants' associations throughout the country to participate in the nation-wide tree planting campaign.

(ENA)

Planting in Arssi Region

Addis Ababa THE ETHIOPIAN HERALD in English 15 Jun 78 p 3

[Text]

ASSELA (ENA) — A total of 250,000 tree-seedlings of seven varieties are to be planted next July on 60 hectares of land in Arssi region. This was disclosed by the head of the branch office of the Forestry and Wildlife Resources Conservation and Development Authority.

The official was speaking to participants of a work-oriented seminar in Arba Gugu province. Attending the seminar are government employees, workers' union leaders, peasants and representatives of urban dwellers and women's associations.

ciations.

"It is a revolutionary duty to conserve forestry resources, for they are an invaluable and highly useful wealth of a country" said the official.

Comrade Second Lt. Fisiha Andeto, a member of the Provisional Military Administrative Council, assigned to the Arssi region, addressed the participants and urged them to reafforest the one-time forest areas since afforestation has a positive impact on farming and cattle-rearing.

FOREST PLANTING PROMOTED IN UPPER REGION

Accra DAILY GRAPHIC in English 21 Jun 78 p 11

[Text]

GOVERNMENT institutions and individuals in the Upper Region are to be allotted plots for tree planting to give afforestation of the region the seriousness it deserves.

This was announced by the Regional Commissioner, Lt-Col. Samuel Gyabaah, when he launched "Arbor Week" at Bolgatanga.

He said the exercise was important not only because of the economic value of trees, but more importantly, because of the "unhappy but rapid southward movement of the Sahara Desert".

"This is a matter that should engage the serious attention of all", he added.

Col. Gyabaah said prizes would be awarded to those who achieved exceptional results.

The Regional Commissioner observed that benefits to be derived from the practice of tree planting included provision of shades and beauty to the natural scenery.

"Trees also act as a break against the elements of weather, especially wind storms which, as you are all aware, periodically cause considerable havoc to property", he added.

Col. Gyabaah said the influence of drought conditions on the country's economic activity was

well-known. "one such devastating effect is the lack of rain fall to support any meaningful agricultural activity".

"The drought weather situation that started in 1973 and resultant food shortages and loss of several herds of livestock are still fresh in our minds", he noted.

On the basis of these known facts, Col. Gyabaah said, the Government decided in 1974 to arrest the situation through a progressive afforestation programme of the northern belt of Ghana.

Col. Gyabaah planted a mahogany tree to mark the occasion. — G.N.A.

ESCOM, MINING COMPANIES RECLAIM LAND

Johannesburg THE STAR in English 4 Jul 78 p 13

[Article by Nike Nicol: "This Land Is Mine Land"]

[Text]

Day and night the great mining draglines rip up farm lands in the Eastern Transvaal highveld.

Tall mounds of black shale, rock and earth pile up where cattle once grazed and farmers planted mealies.

But this is no rape of the land.

Escom is ploughing in money, and the miners at Anglo American's Arnot mine and General Mining's Optimum—both in the Witbank area — are doing their utmost to heal the scars. In some instances the land will be better than it was.

Open-cast mining has become a necessity. Because coal is a valuable fuel it has to be mined as effectively as possible.

New code

Compared with underground mining, which recovers only 40 percent of the coal, open-cast recovers 90 percent. But, fortunately, restoration has now become a code of practice in open-cast mining.

The man behind the reclamation at both mines is well-known South African ecologist Professor John Phillips. In fact late last year he saved Optimum from a reclamation disaster.

Optimum began restoring the land by planting pine trees. But neither the climatic conditions, nor the ground were suitable and just before last summer "we realised we might be faced with hectares of dead trees," mine manager Mr Mike Fleming told The Star's CARE Campaign on a recent tour of the mines.

Professor Phillips was called in, the trees uprooted, a hardy indigenous grass planted and a summer of good rains did the rest.

Top soils

The theory behind restoring opencast mine land is that the spoil and top soils of the "cut" being worked is dumped into the previous cut. Care is taken to separate the spoil from the top soils so that when the bulldozers level it off the top soils end up

at the top.

Admittedly it is not fertile top soil — even supposing it was originally — and "it is impossible to expect crops to grow immediately even with lots of fertiliser," says Professor Phillips.

"Pasturage was obviously best," he told CARE, "so we planted grass and introduced sheep to improve the vegetation and possibly even give a small return."

Sheep pasture

"If the pasturage is managed properly the sheep will thrive. And the next season or two will show if one can introduce cattle."

"In time the restored land can be rented out to good farmers in the vicinity or resold to those who know how to use it."

"Given 10 years, who knows, we might even be able to grow sorghum, maize or potatoes."

[Photo captions]

Gordon Corbett, Arnot's man in charge of restoration (left), and Professor John Phillips on reclaimed open-cast mine land. Already the sheep are thriving there.

Escom engineers and Arnot's mine bosses stand in the dry husks of mealies that were planted on reclaimed land. Behind them rise the spoil heaps from the open-cast "cut."

CSO: 5000

WESTERN CAPE HIT BY DROUGHT

Salisbury THE RHODESIA HERALD in English 13 Jul 78 p 3

[Text]

CAPE TOWN.

THE grain farmers of the Western Cape — who annually produce wheat, barley and oats worth nearly R100 million — fear they may not have any crops at all this year.

And a spokesman for the winter rainfall region of the Department of Agriculture's technical services said yesterday the drought was "probably the worst in living memory".

"If there are any crops at all I doubt whether it would even be worth harvesting," he said.

Vast tracts of the western Cape are in the grip of the drought. Many areas have had only a few millimetres of rain—and others none at all.

Some grain has already germinated but is being scorched to death on the land. In many areas the seeds are dying or have died before germination.

With no sign of rain in the near future several

areas have already been declared emergency pasturage areas. On Monday Porterville, Hopefield, Clanwilliam, Piketberg and Vredenburg will become emergency areas.

This means farmers in these areas will qualify for a 75 percent rebate on railage and transport of fodder to their areas.

Animals are dying in several districts and farmers say it is no longer financially worth while trying to keep lambs alive.

PRICES FALL

Beef prices have dropped sharply and mutton prices are expected to fall, the condition of all animals is deteriorating and farmers are selling stud stock.

The Minister of Agriculture, Mr Hendrik Schoeman, will visit the areas next week for on-the-spot discussions with farmers and farming organisations.

Many farmers say rebates will not be able to save them. They will ask for financial assistance from the Government.

Big farmers run up annual accounts of up to

R100 000 with their individual co-ops annually — and many are way above their normal debt for this time of the year.

This is the crucial week for them. If it rains before Saturday they may be able to save a small percentage of the grain already sown.

Others may take a desperate gamble and sow quick-growing cultivars, but, in addition to the fact that it takes about 110 days to flower, it needs a lot of rain.

The region's rainfall is usually over by September which means that even if they take a chance to put in new seed, they may not produce a crop.

The additional seed will sharply increase co-op accounts, plunging the farmers deeper into debt. The quick growing cultivars are also more expensive and more has to be sown to a hectare.

"Looks like we've had it . . . either way I don't think we are going to win," said a leading Piketberg farmer. He predicts a number of farmers will be bankrupt by the end of this year.

STATE STANDARDS AND THE ENVIRONMENT

Moscow STROITEL'NAYA GAZETA in Russian 4 Jun 78 p 4

[Interview by A. Razgon with the Head of the Sector for Atmospheric Protection of the All-Union Scientific Research Institute for Standardization of Gosstandart of the USSR, Candidate of Technical Sciences L. I. Vitkovskaya]

[Text] TASS reported on 12 May: "A state standard containing regulations for establishing permissible discharges of toxic substances into the atmosphere by industrial enterprises was created and ratified for the first time in Soviet practice." This normative document is supposed to create such a monitoring system in which plant smokestacks, although they will smoke, will do so in moderation.

[Question] What is the new GOST.

[Answer] The rapid growth of industry, enlargement of cities and expansion of the motor vehicle park -- all this pollutes the air basin, damages green plantations and corrodes metals and structures. The smoke and gas concentration in some cities and villages has now exceeded the permissible norms.

The health of people and provision of normal economic conditions have become the main task in development of the GOST. Its basis were the recent advances in production technology, economic and ecological requirements and hygienic norms.

[Question] How are the regulations of the new normative document reflected in the work of the construction organizations and enterprises.

[Answer] Relying on this GOST, the different ministries and agencies will make an inventory of the discharges and will then develop branch standards and norms to determine the parameters of permissible discharges (primarily the amount and volumes).

The physical-geographic and climatic conditions of the terrain, the location of the enterprises and sections of existing and planned housing projects, sanatoria, recreation zones and so on will be taken into account.

There is a lot of work: after all, besides state standards, republic, branch and enterprise standards should be developed.

Moreover, a number of agencies, including Gosstroy of the USSR, must determine the priority list of cities and industrial regions where standards of permissible discharges should primarily be developed and where measures should be implemented to reduce them. These standards will become compulsory throughout the country in planning, reconstruction and operation of enterprises for the main polluting substances, which include sulfur dioxide, carbon monoxide, dust and a number of others.

[Question] Who participated in development of the GOST.

[Answer] The head organization was the Main Geophysical Observatory imeni A. I. Voyeykov. The work was carried out by a total of seven institutes, one of which was a construction institute. This was TsNII promzdaniy [Central Scientific Research, Planning and Experimental Institute of Industrial Buildings and Structures].

[Question] The new GOST is supposed to become effective on 1 January 1980. Other normative documents "generated" by it will then follow. However, not every enterprise now has at its disposal the technology which permits rapid entry into the rigid framework of permissible discharges of toxic substances in the atmosphere. What will happen to them.

[Answer] The GOST envisions this circumstance. If the concentration of toxic substances becomes dangerous and the enterprise is still unable to reduce it to the standard during some time, a step-by-step reduction of the toxic discharges will become effective. And if this is not possible, removal of the enterprises and objects from housing regions of the city or organization of sanitary-protective zones for them will have to be provided in the territorial-agency plans or else the production profile will have to be changed.

[Question] Are similar GOSTs now being developed.

[Answer] Yes and the institutes of Gosstroy of the USSR are participating in preparation of a system of standards for environmental protection. Thus, TsNII promzdaniy, in cooperation with other scientific organizations, is working on indicators of air quality of populated points, while VNIIVODGEO [All-Union Scientific Research Institute of Water Supply, Sewerage, Hydraulic Structures and Engineering Hydrogeology] is working on burial of waste water at underground levels.

6521

CSO: 5000/1075

PROTECTING THE DNEPR RIVER

Kiev RABOCHAYA GAZETA in Russian 25 May 78 p 4

[Article by D. Mironovich, deputy chairman of the oblast soviet of the society of environmental protection, Ye. Kolesnik, chairman of the oblast section for protection of water resources of the society of environmental protection, M. Korol', senior inspector of the oblast inspectorate for environmental protection and O. Ptashko, head of the department of the oblast sanitary and epidemiological station]

[Text] As already reported, the editorial board of RABOCHAYA GAZETA, the State Committee of the Council of Ministers of the Ukrainian SSR on Environmental Protection and the Ukrainian Society of Environmental Protection are conducting a joint surprise check under the slogan "For Clean Waters of the Dnepr River." We publish the first raid material. The annual volume of work on purification installations in Chernigovskaya Oblast comprises 4.5 million rubles, while there are no specialized construction organizations, which leads to interruptions in making environmental protection objects operational.

The towns of the Chernigov area, the plants and factories, public and service enterprises and the population daily take tens of thousands of cubic meters of water from the Desna River and other sources for their increasing needs. And how are we returning this water to the river and lakes?

It should be said that party and soviet organizations and the public organizations of the Chernigov area have done a lot to keep the large and small water basins which feed the Desna pure. The capacity of the purification plants was increased 2.7 times during the past few years.

But this brings no reassurance, since there are still many unresolved problems. And the foremost of them is the unsatisfactory solution of problems in standardization of plans for purification plants.

A positive example may be the almost unique collective of Ukrkommungiproproyekt [expansion unknown] -- the general designer of the purification plants of

Chernigov. The purification plants constructed in the city from its plans provide high-quality purification of household and industrial wastes. The collective of purification plants headed by experienced engineer P. Tulup is also thoughtful. Daring operation of machinery permits discharge of exceptionally clean water into the water basins.

The following feature of the workers of Ukrkommungiproproyekt should also be noted: before turning over all our projects to the customers, they are coordinated and registered at the sanitary and epidemiological station, in the state water inspectorate and other organizations of environmental protection.

Unfortunately, this cannot be said about other planning organizations. The planners of Ukrmyasomolprom [expansion unknown], the Khar'kov Branch of Gipropishcheprom Institute [State Planning Institute for the Planning of Food Industry Establishments] and the Nezhin Purification Plants operate counter to established regulations and turn over projects to the customers, avoiding an environmental protection check. The workers of Gipromyasomolprom, for example, persistently do not fulfill the requirements on replacement of horizontal four-section settling tanks by radial tanks, which have given a good account of themselves in operation at Chernigov. The design of the purification plants of the Priluki Meat-Packing Combine requires significant improvement. However, the planners have brushed aside the complaints of the customer. The oblast inspectorate, having required explanations, received a bureaucratic answer written for form only: "We are sending the conclusions of Gosstroy of the Ukrainian SSR on construction of a settling tank according to standard project No. 4-18-745 at purification plants of the Priluki Meat and Milk Complex." In short, there is project and you can be satisfied with it, but we do not intend to improve it.

The clearly unsuccessful design of purification plants for the Novgorod-Severskiy Cheese-Making Plant also emerged from the hands of these planners. Moscow specialists, invited to adjust the machinery, refused to guarantee normal purification of waste waters after 3 years of work. And 400,000 rubles were expended on this! An additional 100,000 rubles are required to bring the matter to an end. But the Ministry of the Meat and Milk Industry of the Ukrainian SSR is not rushing to allocate the funds. And the purification plants stand like a memorial to bungling and waste.

The quality of the planning documentation of the Khar'kov Branch of Gipropishcheprom may also not be praised. Its projects for the Petrovsk, Pelyukhovo and Semenovka Starch plants have so many errors that the environmental protection inspection organizations are unable to "approve" them.

Successful operation of the purification plants and an increase of their capacities depends not only on the planners but on the builders as well. If a foreman takes charge, both the quality of the work is high and the machinery is trouble-free. And on the other hand, the plants concocted somehow have been standing for years without movement. And who actually is building the purification plants? Everyone to whom it is suggested and who is

compelled to, without taking into account experience and practice. But someone must be compelled to, because the volume of work on purification plants is enormous -- 4.5 million rubles annually! These monies must be assimilated. And they are taken for assimilation, although there are neither personnel, capabilities nor experience. Of course, you do not expect a good result. Minsel'sstroy [Ministry of Rural Construction] of the Ukrainian SSR, for example, has postponed the deadline for putting the plants in the city of Shchors into operation for 4 years, Minzhilkommunistroy [expansion unknown] of the Ukrainian SSR has postponed turnover of objects at Oster for the same number of years, while Minpromstroy [Ministry of Industrial Construction] of the Ukrainian SSR has postponed turnover at Priluki for 3 years.

Is it not really clear that the time has come to create a specialized construction organization for erection of purification plants.

Incidentally, a word about personnel. The chief engineer of the Chernigov Oblast Administration of Public Services O. Rudnik says:

"It is very important that there be specialists on construction of purification plants. Cadres of specialists are also required in the operations service. We have only 24.2 kilometers of sewage conduit, 110 kilometers of sewer networks, 21 kilometers of access lines to them and 36 kilometers of industrial sewers in Chernigov. They must be well maintained. But there are no people who know how to do this. And no one is being trained in the republic."

Regardless of how sad it is, one must admit that the Chernigov area is almost at the lowest level in the republic in providing public sewage conduits to the towns and villages.

And another thing. Construction of general urban purification plants is being financed with the participation of enterprises and organizations. And this is good. But the unfortunate thing is that there are many "officials" who are delaying fulfillment of the work. Thus, the following ministries of the Ukrainian SSR have not yet turned over money to the Chernigov City Administration for Capital Construction: Light Industry -- 1.2 million rubles, the Meat and Milk Industry -- 1.64 million rubles and the Chemical Industry of the USSR -- 0.7 million rubles. Such a narrow agency approach to an important national economic matter creates "rapids" on the Desna River and other open water basins, difficult to overcome, which must be protected from pollution by industrial and household wastes waters.

The beautiful Desna flows in its own green banks and caresses the golden beaches with gentle waves. Its fish schools are multiplying from year to year. But oil slicks are gradually spreading on the smooth water surface and thick "wedges" of unpurified waste water are cutting into the gurgling streams. It is time to stop this. The polluters of the waters and those who are postponing introduction of purification plants into operation must be dealt with more strictly.

There is a law. Its requirements must be strictly fulfilled.

NATURAL DISASTERS IN MOLDAVIA

Kishinev SOVETSKAYA MOLDAVIYA in Russian 15 Jun 78 p 3

[Article by N. Polozhenko, Minister of Public Utilities of the Moldavian SSR:
"Do Not Permit Lags"]

[Text] A little more than a year has passed since our republic suffered a natural disaster. As a result of an earthquake, a hurricane and torrential rains, 5,501 dwellings of local Soviets or 33,450 apartments and also a number of other objects of housing-public and sociocultural designation were damaged. The dimensions of the losses for objects subject to repair and restoration alone exceeded 9 million rubles.

Objects of culture, national education and health, which should be restored and repaired by the repair-construction organizations of the Ministry of Public Utilities of the Moldavian SSR according to instructions of the Central Committee of the Communist Party of Moldavia and of the government of the republic, also suffered considerable damage.

High losses were inflicted on the housing-public utilities of Kishinev and also to the towns of Kagul and Leovo. Apartment buildings and public buildings of old construction, which were inflicted with a second strong earthquake, suffered especially severely in these and other towns and villages of the republic.

But the citizens of Moldavia were not threatened with the bitter fate of disaster victims which usually awaits people in the capitalist world in these cases. A governmental commission was created in the republic on the 2nd day after the earthquake and urgent measures to correct the losses inflicted on the utilities were implemented.

The Communist Party and the Soviet Government immediately rendered the necessary assistance to the republic with financial and material resources. Large funds were appropriated to correct the consequences of the earthquake, more than 2,000 cubic meters of lumber and construction timber, 900 tons of cement, 1,300 tons of asphalt, 500,000 slate tiles, 300,000 square meters of rolled roofing material and more than 40 automatic machines, mechanisms and other equipment were additionally allocated.

The Ministry of Public Utilities of the Moldavian SSR was faced with carrying out a large volume of work. The ministry and its subordinate organizations, party and Soviet organizations in the rayons which suffered most from the earthquake had to implement immediate measures to eliminate the damage, to create normal housing conditions to the residents whose apartments were damaged and to provide rhythmic operation of all services of housing-public utilities.

More than 347 complex and specialized brigades, which were provided with the necessary technical, construction and special materials, were created in all the 54 repair-construction, housing-public utility and other organizations of the ministry to perform repair and restoration work. Similar brigades and sections were also created at the industrial enterprises and in the organizations of the republic.

As a result of the measures implemented, of the skillful organizing work on the part of the management and engineering-technical workers, the high consciousness and discipline of the collectives of all production sections, the housing-public utilities and repair-construction organizations of the ministry coped successfully with the task posed in 1977. A total of 11.9 million rubles was expended on the whole throughout the republic to correct the effects of the earthquake, including 3.7 million rubles by the repair-construction organizations of Moldremdorstroy Trust [expansion unknown], 4.9 million rubles by the Kishinev Gorremstroytrest [City Repair and Construction Trust] and 1.9 million rubles by the housing-operation and housing-public organizations. In this case 6.3 million rubles were expended on capital and routine repair of the housing fund and objects of public designation, 1.5 million rubles were expended on health objects and 2.6 million rubles were expended on national education objects.

Capital and routine repair of 3,861 apartment buildings of local Soviets with more than 25,000 apartments was carried out as a result of these funds. The Kishinev Gorispolkom [City Executive Committee] had turned over more than 2,000 new apartments to a significant number of families who suffered from the earthquake as of 1 May of this year.

After restorative repair, 3,624 apartments in buildings of local Soviets, 36 schools, 34 kindergartens, 25 hospitals and polyclinics, 4 higher and 2 secondary educational institutions and 27 other objects of sociocultural designation in Kishinev were turned over for operation; 657 apartments, 2 schools, 3 kindergartens, 2 sections of the city hospital, a physical therapy room and a city club were turned over at Kagul; and 821 apartments, 6 schools, 5 kindergartens, a Pioneer camp, a house of Pioneers and schoolchildren, a regional polyclinic and hospital, stomatological polyclinic and other objects of city economy were turned over at Leovo.

Repair of the production buildings, administrative buildings and commercial and service objects was mainly completed.

The successful work of the repair-construction organizations of the Kishinev Gorremstroytrest, the Kagul Road-Repair-Construction and the Leovo Repair-Construction Administrations and also of the housing-operational organizations of the Kishinev Gorzhilupravleniye [City Housing Administration] last year should be noted.

It is impossible not to note the active participation of the population, who repaired a significant part of the apartments through their own efforts, in correcting the consequences of the earthquake.

The tasks for repair-restorative work have been overfulfilled. But the program of capital construction and introduction of buildings and structures by the ministries of construction and rural construction of the Moldavian SSR, the Kishinev and Kagul gorispolkoms and the Leovo Rayispolkom [Rayon Executive Committee] into operation was interrupted last year. Three kindergartens, two general education schools for 2,740 students, a 16-storey dormitory and eight buildings for 706 apartments were not put into operation in Kishinev. Introduction of two 48-apartment buildings and kindergartens for 320 seats was interrupted in Kagul and three 48-apartment buildings and so on was interrupted in Leovo.

The task for assimilation of capital investments allocated to correct the consequences of the earthquakes was also not fulfilled. In Kishinev alone, 1.3 million rubles was not assimilated for housing construction, 870,000 rubles was not assimilated in Kagul on objects of education and health and 60,000 rubles were not assimilated in Leovo on health objects. The planning-estimate documentation was not prepared on time and significant lags were committed in supply with reinforced concrete structural members, metal, rolled steel, cement and other materials to a number of construction projects by Moldgiprostroy [expansion unknown], Moldkommunproyekt [expansion unknown] and Kishinevgorproyekt [expansion unknown] institutes.

A total of 2.6 million rubles of capital investments was allocated for 1978 by Minkommunkhoz of the MSSR [Ministry of Public Utilities of the Moldavian SSR] to correct the consequences of the earthquake, of which 2 million rubles were directed toward public and 600,000 rubles were directed toward housing construction. As a result of these funds, it is planned to construct and put into operation purification plants with capacity of 3,300 cubic meters per day, 20.3 kilometers of sewage conduits, 2 kilometers of gas networks and water pipelines with capacity of 1,400 cubic meters of water per day and 5,300 square meters of housing at Leovo. Moreover, 1 million rubles has been allocated to correct the consequences of the earthquake for capital repair of the housing fund of local Soviets.

Five months of the 3rd year of the five-year plan have passed. Whereas repair-restorative work on the whole is being carried out at good rates, this cannot be said about the Leovo and Kotov repair-construction administrations, the Chadyr-Lunga Road-Repair-Construction Administration and the Kriulyany Repair-Construction Section of the Ministry, which have not assimilated the

allocated funds for repair and restoration of the housing fund, schools and preschool children's institutions. The rates and quality of repair of housing and objects of sociocultural designation should also be increased by the Kishinev Gorremstroytrest.

As during last year, the assimilation of capital investments is causing alarm. The construction of public utility objects is being carried out especially slowly, for which only 76 percent of the funds have been assimilated during the first quarter.

The course of construction of the Strashena-Kishinev sewage conduit, starting during the second quarter of this year, is specifically causing great alarm (the general contractor is SU-9 of Promstroy Trust). The plan on this object was fulfilled by only 46 percent during the first quarter.

The contract organizations of Minsel'stroy of the MSSR are carrying out construction of sewers in the city of Kotovsk at extremely slow rates, where the volume of capital investments has been fulfilled by only 30 percent during the first quarter.

The task is to assimilate completely all the funds allocated to correct the consequences of the earthquake for all objects of health, national education, housing-public and sociocultural designation. To do this, the managers of the contract organizations of the ministries of construction and rural construction of the republic must implement urgent measures for significant improvement of organization and technology of construction, for timely supply of the objects under construction with construction materials, articles, a work force and machinery and on creation of the necessary service conditions for the workers.

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CSO: 5000

FOREST FIRES IN LENINGRADSKAYA OBLAST

Leningrad LENINGRADSKAYA PRAVDA in Russian 9 Jun 78 p 4

[Article by I. Sokolov, deputy chairman of Lenoblispolkom]

[Text] Despite the measures implemented to eliminate forest fires, the situation remains extremely tense with the fire danger to forests, peat bogs and agricultural lands with regard to the unchanged weather conditions over the entire territory of Leningradskaya Oblast. Taking this into account, the Extraordinary Committee to Control Forest Fires of Lenoblispolkom [Leningrad Oblast City Executive Committees] has decided to prohibit temporarily, beginning 8 June 1978, all visits to forest, rivers, lakes and peat mines over the entire territory of Leningradskaya Oblast until special authorization.

The decision made by the Ispolkom of the Leningrad Oblast Council of Working People's Deputies and the Extraordinary Committee on temporary prohibition of visits by citizens to forests, rivers, lakes and agricultural lands was caused by the complicated weather conditions. No rain has fallen on the territory of Leningradskaya Oblast for 1.5 months, atmospheric humidity has decreased to 40-45 percent and it has decreased to 35 percent in some regions. This means that an accidentally dropped spark from a burning cigarette, a glowing coal from an extinguished campfire or discharge of hot gases from the exhaust pipe of an automobile may cause a fire in the forest, on the edge of the road and in any agricultural lands.

More than 900 fires have occurred recently in the oblast which encompassed more than 500 hectares of forest and about 1,500 hectares of peat beds. The cause of these fires in most cases was careless handling of fire by citizens visiting the picturesque locations of the oblast for recreation.

Cases of ignition of the forest and peat lands also occurred due to a careless attitude of some managers and individual workers in fulfilling the Fire Safety Regulations. Thus, the chief of PMK-20 [Construction-Installation Combine] Ye. V. Vasil'yev in Tikhvinskiy Rayon, not having received

authorization to burn construction wastes and not having provided fire fighting safety, ignited bonfires. As a result three large focal areas of the fire occurred. The chief of PMK-19 I. N. Strakhov in Kirishskiy Rayon organized burning of construction wastes on agricultural lands of Sovkhoz Budogoshch', without providing measures of fire fighting safety, which led to ignition of the forest. Criminal proceedings were instituted for these cases.

A large amount of peat was ignited at the peat enterprise of Verdug in Luzhskiy Rayon and at the peat enterprise Naziya in Kirovskiy Rayon because of poor organization of fire fighting measures and the focal areas of the fires have still not been extinguished in some locations.

The Lenoblispolkom has enlisted the chief engineer of the Lentorf Association N. F. Kozhkin and the chief engineer of the Lemmioratsiya Association M. B. Chernyak for strict administrative responsibility.

A considerable number of citizens have been detained in the forest lands of the oblast for violation of Fire Safety Regulations.

The decision adopted by the Extraordinary Committee was caused by the necessity of providing conservation of our forests during the fire-danger period, which are of incalculable national economic and health significance. The created situation requires high consciousness, discipline and vigilance of all Leningrad citizens, implementation of operative measures to detect focal areas of fire and to render active assistance in eliminating them.

Comrade citizens of Leningrad! Your conscientiousness and high discipline will contribute to successful implementation of the measures intended to control natural disasters. Forest protection is a matter of state importance and our common purpose!

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CSO: 5000

ENVIRONMENTAL PROTECTION IN LITHUANIA

Vil'nyus SOVETSKAYA LITVA in Russian 14 May 78 p 2

[Article: "Environmental Protection Is a Common Matter"]

[Text] The Committee on Environmental Protection of the Supreme Soviet of the Lithuanian SSR discussed the problem of how the norms on environmental protection are adhered to in development of the planning documentation. The deputy chairman of Gosstroy of the republic A. Rasteyka gave a report. Deputies of the Supreme Soviet of the Lithuanian SSR Yu. Bazis, A. Bubyalis and S. Ramanauskas, Chairman of the Committee V. Sneshka and other participants of the meeting participated in the discussions.

The skillfully prepared planning documentation, it was emphasized at the meeting, is one of the main conditions in order that the environment, which surrounds newly constructed and reconstructed industrial enterprises, agricultural and other objects, meet the requirements of time in order that the work related to significant changes of the landscape have the least negative effect on the environment.

The planning organizations have recently been devoting a great deal of attention to the quality of the documentation and are placing more requirements on adherence to environmental protection standards.

More and more green zones in suburbs, forest parts and preserves are being planned. The projects of the National Park of the Lithuanian SSR, the landscape preserves of Zelenyye Ozero and Kurshskaya Kosa, forest management, recreation zones in the forests and forest parks, prepared by the Experimental Planning-Design and Technological Office of the Ministry of Forest Management and the Timber Industry, are original and interesting. The Republic Institute of Planning Land Management has prepared projects for allocating areas for more than 270 objects.

A reduction of industrial noise is of great importance for preserving a healthy environment. Therefore, the planned enterprises or shops are being concentrated in industrial regions. The shops are arranged so that the noisy buildings or installations are shielded by warehouses, green plantations

and other noise insulators. Recreation zones are being equipped on the territory of industrial enterprises.

Much effort is being applied so as to inflict as little harm as possible on the changes occurring in the countryside. Green protective zones are being planned along the rivers, ponds and lakes. Much attention is being devoted to protecting the soil against erosion in projects for land management.

At the same time it was noted that incidents are still occurring when planned and constructed objects inflict harm on the environment because of poorly performed work by the planners and construction organizations and the carelessness of the customers. Thus, the Antanavskiy Complex for Feeding Horned Cattle and the Santakskiy Complex for Breeding and Feeding Swine, from which the liquid manure is sent to reclamation plants and pollutes the Sheshupe River, were constructed in Kapsukskiy Rayon. Collection of spent oil is not provided in the planning of fuel depots. Objects subject to protection for scientific purposes are frequently spoiled. This happened to the Notigalo Swamp.

The amount of unpurified waste waters increases each year. The planning organizations should utilize more extensively the latest technical solutions in sewage system projects, should introduce the advances of science more rapidly and should use collecting elements to a greater extent. Unspecialized planning organizations are still frequently tying standard projects for purifications to specific projects and unspecialized construction organizations are building them.

The scrubbing of smoke of boiler rooms of nitrogen gas and sulfur dioxide is still undependable. The planners provide only an increase of the height of the smokestacks. Therefore, the problem of atmospheric pollution should be solved by the corresponding scientific research institutes.

Members of the Permanent Committee on Environmental Protection of the Supreme Soviet of the Lithuanian SSR have pointed out that not all projects contain special sections on protection of the waters, soil and atmosphere against pollution and if they do, they are most frequently not specific. The Committee on Environmental Protection jointly with Gosstroy should develop the corresponding procedural instructions.

Only half of the farms of the republic now have established water-protective zones, of which equipping of them is being completed in only every fourth farm. It would be feasible if the reclamation engineers jointly with the forest management workers equipped the protective zones and transferred them to land users. The latter should bear responsibility not only for operation of the reclamation facilities but for the condition of the protected zones.

The deputies specially emphasized cases where insufficient attention is being devoted in selection of a location for construction of objects to protection of the greatest resource of nature -- the land, to efficient use of it, and

presented facts of violation of the land codex. More and more attempts are being made to locate them on the best lands with smooth terrain and sometimes even on reclaimed lands for purposes of reducing the cost of the construction of objects.

Those appearing emphasized the need to require stricter adherence of the planning organizations and agencies that monitor protection of the surrounding environment and work on readjustment of nature. They should observe the norms of environmental protection, should perform the main functions and should utilize better the rules of authority granted to them when developing the projects.

The Permanent Committee on Environmental Protection made a decision on the discussed problem. It was recommended that the planning organizations, Gosstroy, the Committee on Environmental Protection, the Ministry of Reclamation and Water Management and other agencies that monitor protection of the surrounding environment and work on transformation of nature fulfill the norms on protection of nature and the surrounding environment without stipulation and that they monitor adherence to them more strictly. It was suggested that the planning organizations systematically improve the qualifications of workers and work more closely with scientific research institutions. It was recommended that Gosstroy introduce principal proposals into Gosplan to improve the coordination of construction work and coordinate the funds and monies of the ministries and agencies to implement joint measures on environmental protection.

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CSO: 5000

DECREE ON STUDY, PREVENTION OF MUD FLOWS, AVALANCHES ANNOUNCED

Moscow SOBRANIYE POSTANOVLENIY PRAVITEL'STVA SOYUZA SOVETSKIKH
SOTSIALISTICHESKIKH RESPUBLIK in Russian No 6, 1978 pp 111-114

[Decree No 37 on Measures to Improve the Protection of Population Points, Enterprises, Other Objects and Land Against Mud Flows, Avalanches, Slides and Cave-Ins]

[Text] In the aim of improving the protection of population points, enterprises, other objects and land against mud flows, avalanches, slides and cave-ins, the USSR Council of Ministers decrees:

1. The Union republic councils of ministers the territories of which are subject to mud flows, avalanches, slides and cave-ins, with the participation of the USSR Ministry of Geology, the Main Administration for the Hydro-meteorological Service Under the USSR Council of Ministers, the USSR Ministry of Agriculture, the USSR Ministry of Reclamation and Water Management, the State Forestry Committee of the USSR Council of Ministers and the other concerned USSR ministries and departments:

In the aim of disclosing the territories subject to the formation and development of the designated phenomena and processes prior to 1980 are to make special surveys of the lands, regardless of the categories of them and the departmental affiliation of the land users. The USSR Ministry of Agriculture is to consider the data from the surveys on the territories which are potentially dangerous or have been subjected to mud flows, avalanches, slides and cave-ins in carrying out the state land cadaster;

On the basis of materials from the surveys, they are to work out and implement immediate measures to protect the population points, the recreational areas of workers, enterprises, other objects and land against mud flows, avalanches, slides and cave-ins;

They are to work out comprehensive plans for protecting the population points, enterprises, other objects and land against mud flows, avalanches, slides and cave-ins. The approval of these plans is entrusted to the Union republic councils of ministers;

On the basis of additional materials from observations and research, the necessary adjustments are to be made in the lists given in the comprehensive plans for population points, recreational areas, enterprises, other objects and lands which are threatened with the danger of the appearance of mud flows, avalanches, slides and cave-ins and in the areas of which preventive measures must be carried out.

2. The USSR ministries and departments, when necessary, are to set up subdivisions of a protective service as part of the departmental enterprises, organizations and institutions located in areas which are potentially dangerous or have been subject to mud flows, avalanches, slides and cave-ins (within the limits of the wage fund and number of personnel of the managerial staff) for carrying out preventive measures and work to eliminate the harmful consequences caused by these hydrometeorological phenomena and geological processes.

3. To entrust the elaboration of technical plans for building objects and installations and for carrying out other measures to protect population points, enterprises, other objects and land against mud flows, avalanches, slides and cave-ins upon the orders of the Union republic councils of ministers and the concerned USSR ministries and departments to the USSR Ministry of Reclamation and Water Management and the USSR Ministry of Power and Electrification, and for protecting national railroads and highways to the Ministry of Transport Construction.

4. In the draft annual and five-year plans, the USSR Gosplan, the State Committee of the USSR Council of Ministers on Science and Technology, the Union republic councils of ministers and the USSR ministries and departments are to provide for the allocating of capital investments, material-technical, financial and labor resources needed for carrying out scientific research, design, construction and other work required for making observations, forecasting the occurrence, distribution and development of mud flows, avalanches, slides and cave-ins, and for carrying out preventive measures and measures to eliminate the harmful consequences caused by these hydrometeorological phenomena and geological processes.

The USSR Gosplan is to consider the carrying out of the designated construction work in drawing up the contracting plans.

5. The USSR Gosstroy, together with the USSR ministries and departments involved in the designing and construction of projects in regions which are potentially dangerous or have been subjected to mud flows, avalanches, slides and cave-ins, with the participation of the USSR Academy of Sciences and the Union republic councils of ministers, in 1978-1979, considering the specific features of the sectors and types of construction, are to work out instructions for the designing and construction of protective structures against mud flows, avalanches, slides and cave-ins, and to approve these instructions.

6. The Main Administration of the Hydrometeorological Service Under the USSR Council of Ministers is to take measures to strengthen the observation service for the formation of mud flows and avalanches, while the USSR Ministry of Geology is to take measures to further develop work in the area of studying the slide and cave-ins processes, to observe them and forecast their appearance, and to promptly submit the necessary materials and information to the Union republic councils of ministers, the concerned USSR ministries and departments, as well as to the enterprises, organizations and institutions.

In the construction and reconstruction of objects and installations in areas that are potentially dangerous or have been subjected to mud flows and avalanches, the USSR ministries and departments and the Union republic councils of ministers are also to build service buildings and communications lines for the stations of the mud flow and avalanche service and housing for the workers of the stations, in order that these stations using the forces of the Main Administration of the Hydrometeorological Service Under the USSR Council of Ministers can carry out the necessary observations, compile forecasts on the mud flow and avalanche danger and issue them to the concerned organizations.

7. In 1978-1979, the Ministry of Instrument Building, Automation and Control Systems, the USSR Ministry of Geology and the Main Administration of the Hydrometeorological Service Under the USSR Council of Ministers are to work out emergency warning systems for the danger of the appearance of mud flows, avalanches, slides and cave-ins, as well as examples of instruments for automatic remote measurement of the basic parameters of these phenomena and processes.

The elaboration of the designated emergency warning systems and the models of instruments should be carried out according to the technical requirements of the Main Administration of the Hydrometeorological Service Under the USSR Council of Ministers and the USSR Ministry of Geology with the approval of the Ministry of Instrument Building, Automation and Control Systems.

The Ministry of Instrument Building, Automation and Control Systems is to provide series output of the emergency warning systems for the danger of mud flows, avalanches, slides and cave-ins and instruments for automatic remote measurement of the basic parameters of these phenomena and processes within the dates and in the amounts agreed upon with the clients.

The Main Administration of Geodesy and Cartography Under the USSR Council of Ministers together with the USSR Ministry of Geology and the Main Administration of the Hydrometeorological Service Under the USSR Council of Ministers in 1978-1980 are to compile special thematic maps for regions which are potentially dangerous or have been subject to mud flows, avalanches, slides and cave-ins, as well as the periodic renewal of these maps and the supply of them to the concerned organizations.

9. The USSR Ministry of Higher and Specialized Secondary Education together with the Union republic councils of ministers and the concerned USSR ministries and departments in 1978 are to examine and resolve the question of training the specialists needed for carrying out work in the area of protecting population points, enterprises, other objects and land against mud flows, avalanches, slides and cave-ins, in accord with the need of the national economy for them.

Chairman of the USSR Council of Ministers, A. Kosygin
Secretary of the USSR Council of Ministers, M. Smirtyukov

Moscow, the Kremlin, 7 March 1978, No 183.

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CSO: 5000

INTERNATIONAL AFFAIRS

MEDITERRANEAN SEA POLLUTION CONFERENCE ON PREVENTIVE MEASURES

Rome L'UNITA in Italian 19 Jun 78 p 3

/Article by Florio Amadori: "Undertakings and Proposals from the Rimini Conference for Ending Pollution--How the Mediterranean Will Be 'Cured'"/

/Text/ Eighty percent of the coastal urban centers still do not have water-purification installations, and liquid wastes end up in the sea. The need for preventive action was emphasized. Industry must take the "environmental cost" into consideration. The need for a set of rigorous standards and international cooperation was pointed out. Discussion of the example of Emilia-Romagna.

From an investigation conducted in 22 large cities in the Mediterranean Basin, it was learned that approximately 80 percent of the urban agglomerates still do not have water-purification installations, and consequently their liquid wastes end up directly in the sea. The investigation was conducted by experts of the Union of Mediterranean Cities, the international organism established in 1977 to combine the efforts and coordinate the operations of local administrations in defense of the environment (in addition to promoting cultural and economic cooperation and peace among the nations of the three continents). Last week in Rimini, the union held its third conference, with the goal of taking practical steps against pollution of the sea, thus moving from mere denunciation of the situation, as at the conferences in Beirut in 1973 and Rijeka in 1976, to the point of doing something about it. The investigation of the state of purification in the 22 Mediterranean cities included in the sample served to clarify the situation and identify the principal objectives of operations by the local and regional administrations and the national governments. The population that lives on the banks of this big "salty lake" (3 million square kilometers of surface, surrounded by 18 countries with 300 million inhabitants, and that figure is expected to double by the year 2000) pours more than 30 million cubic meters of dirty water back into the sea in a single day--a tremendous discharge which, unless

something is done on an urgent basis, might reduce the Mediterranean to the state of a sewer, with consequences for the economies and the life of entire nations that can easily be imagined.

It has been calculated that in the year 2000, when urban discharges are expected to reach 37 billion cubic meters annually, a good 14 billion dollars will have to be invested to render that great, contaminating mass harmless. But the cost of preventive measures is already reaching stratospheric levels. There are those who assert that it will take decades to clean up the Mediterranean, and especially that it will take immense quantities of money (an Egyptian microbiologist has come up with the theoretical figure of 5 trillion dollars) whose value would come very close to that of all the economic operations the countries concerned could carry out in a year, taken as a whole.

Science Fiction?

This is the same as to say, in order to save the Mediterranean, all the funds will have to be used which ordinarily are employed in the other sectors of the life of a community for at least 12 months.

Science fiction? Perhaps, but industrial "progress," as capitalist societies have understood it up to the present, is unquestionably showing itself to be engaged in committing suicide, both from the economic and the biological points of view. The status of the environment, taken as a whole, is becoming the critical point in a certain type of development and of utilization of resources. The discussion, for the present--there were plenty of examples of this at the Rimini conference--has to do with countermeasures, which obviously cannot be carried out only on the basis of inductive reasoning (up to the present, action has been taken in the following way: first pollution takes place, and then, if one is forced to it and means are available, purification takes place), but those countermeasures are concentrated on prevention, on a different way of making use of resources and, in short, on a new method of production which takes the environmental cost into account.

In his speech at Rimini, Comrade Lanfranco Turci, the president of the Emilia-Romagna Region, pointed out two needs: "What is needed," he said, "is to accomplish effective qualitative progress in our ability both to comprehend the objective situations--the limits within which the attack on the environment is taking place--and not only to exercise criticism in regard to them but also to take the correct, politically oriented, action for the purpose of bringing about a reorganization of the productive processes and of the individual and social interests. Therefore it is necessary, first of all, to move on from mere descriptions of what is wrong to determining what actions are to be taken and the corresponding territorial responsibilities--in short, it is necessary to connect the effects with the principal causes. Only in that way will the local communities not feel themselves to be the victims of events that are apparently of worldwide dimensions and the result of unpredictable whims of fate, for those are factors which

tend to produce a certain fatalism and a feeling of lack of confidence and impotence.

"The second thing that is needed is to indicate the implements with which such disasters can be made up for and anticipated, as well as the expenditures and sacrifices which will be required of individuals and of the communities, so that it will be possible to decide which projects should be carried out immediately and which it will be necessary to postpone. The directions to be followed and the methods of motivating people which should be used, in my opinion," said Comrade Turci, "can be summarized as follows: set up national and community research projects, arranging for the scientific structures to find means of permanent interaction with the local communities, and, by means of pilot experiments throughout the territory, it will be possible to move immediately from the phase of preparing projects to that of putting them into effect. Experiments of an advanced nature which are going on in the various countries should also be given publicity. Furthermore, the various branches of industry engaged in production should be made, through the application of rigorous regulations, to adopt the safeguards and new technologies which are capable of eliminating any damage to the environment before it has a chance to even get started, while insisting that the principle that the one who pollutes is the one who must pay for cleaning up the pollution be followed. A program of actions to be taken in the areas which are in the worst shape should also be set up, making use of the technical and financial support of national and international bodies."

An Exhibition

The work of the conference (three committees of local administrators and scholars went into the specific subjects of the role of the municipalities and of the technical and legislative standards and the plans for cleaning up pollution and for financing priority projects for action on the regional, national and international scale) was begun by taking up these various problems in a serious way, with a commitment to move on into practical, coordinated work on an urgent basis. A significant example to be viewed by those attending the conference was the illustrative exhibition in the Rimini Fair courtyard prepared by the Region of Emilia-Romagna which was concerned with the inspections and operations that have been carried on for years throughout the territory of that district to prevent pollution of its waters, its land and its atmosphere.

According to a number of experts from various countries, this is one of the most advanced and most effective operations to have been carried out in the whole world up to the present, and certainly the first one to cover the entire Mediterranean. Investments amounting to over 60 billion /presumably lire/ (the city of Rimini alone has spent 15 billion for its purification system), water purifiers in all the centers along the coast and in the principal hinterland cities, an extremely thick network of automatic recording devices which feed information into an electric brain, an

oceanographic vessel connected with the biological and marine research center at Cesenatico and also, in a short while, a satellite for monitoring atmospheric pollution certainly constitute elements which are capable of providing substantial evidence of the efforts that have been made by the local administrations. But, above all, these various elements are also capable of providing suggestions at the other levels of public authority and to the other countries, which will have to get just as deeply involved, in their respective spheres--and in a systematic manner--if they do not want the Mediterranean to remain--as is written in the French text of one of the motions approved by the conference--just "une poubelle" (a garbage can).

9258

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INTERNATIONAL AFFAIRS

NORWAY WORRIED ABOUT OVERFISHING IN NORTH SEA

Oslo AFTENPOSTEN in Norwegian Evening ed 12 May 78 p 1, 12

[Text] (Einar Kr. Holtet) Fishing for capelan, herring, and mackerel can possibly be so strongly curtailed that large sections of the fishing fleet can lie idle for periods of time. "There has been too much fishing," says Gunnar Gundersen, Management Executive in the Department of Fisheries, to AFTENPOSTEN. The regulation committee for fisheries is now in favor of a strong reduction of mackerel fishing in the North Sea, where the EEC countries and Norway fish in common.

The committee also recommends a strong limitation of capelan fishing in the Barents Sea, and a preliminary ban on the fishing of Atlantic-Scandinavian herring.

"The situation is serious," says General Secretary Viggo Jan Olsen, of Norway's Fishing Company, to AFTENPOSTEN. The Fishing Company will discuss the problems at a meeting about 25 May.

Director Gunnar Gundersen in the Department of Fisheries says to AFTENPOSTEN that reports of ocean researchers, which are the basis for the evaluation of the regulatory committee, must be discussed further in the future.

"Has there been too much fishing for the fish that are now regulated?"

"Much of the problem is the result of too much fishing," Gundersen said. "To be sure, there are several causes, and for mackerel there has been a generally weak development of the stock for several years. We have not had any really large increase in mackerel since 1969, according to the researchers. But a large part of the problem comes from overfishing in former years, and this is generally valid. This is the reason why the researchers and the regulatory committee now must cut down simultaneously in many areas. The regulations are coming too late," Gundersen said. He added that this is particularly true for the herring and mackerel fisheries of the North Sea. Herring fishing was completely forbidden last year, but to ensure the increase of the herring stock, we must hold the line for another year. Knut Vartdal, Director of Fisheries, said to DAGSNYTT this morning

that a decision on mackerel regulation must be made within a month for the sake of the fishermen. It is the Department of Fisheries which will make the policy decision.

If there is close to a 50 percent reduction of the mackerel quota, which this year is 190,000 tons for the EEC and Norway together, 150 purse fishers with from 1,500 to 2,000 fishermen will be affected. The mackerel quota was already reduced by 1/3 last year for the current season.

The situation is not very bright for purse fishers because they are in general boats which also must resign themselves to reduced capelan quotas from this summer on. The boats in question are medium-sized and small purse fishers which take advantage of the time between seasons of capelan fishing to fish mackerel and, to some extent, sprat in the North Sea.

The majority in the regulatory committee, which is the advisory organ, is obviously in agreement on this, but they feel that there must be a strong reduction in order to save the stock of mackerel. The majority recommends that Norway contact the EEC in order to bring mackerel fishing more into agreement with what the researchers think is responsible.

There are new research results which show that the stock has gone back considerably from last year. The regulatory committee will ask the Department of Fisheries to take steps to get the EEC to agree to a new quota reduction.

"If we do not undertake effective regulation now, it may be possible that we will have to completely forbid mackerel fishing next year," said Gundersen to AFTENPOSTEN. He does not want to predict the possibilities of getting the EEC to agree to a 50 percent reduction. "We hope to achieve an arrangement," he said.

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GREECE

POLLUTED ATHENS SUBSOIL, WATER SYSTEM REPORTED

Athens TA NEA in Greek 30 May 78 p 1

[Article by Giorgos Karalis]

[Text] The whole of Athens stands on slime. A great percentage of its subsoil has been polluted especially by the outflow of refuse and wastes which has reached a high level. This fact forebodes serious dangers to the public health especially since there are also serious leakages from the water supply network with the result that the refuse, wastes, potable water and rainwater are merging into one body in the water-carrying areas under the whole capital.

The above are conclusions which are being exclusively published by TA NEA today and which have been reached following hydrological research which the Geological and Metallurgical Research Institute [IGME] has made in recent years. The research has shown that the [Athens] subsoil contains large quantities of chemical compositions which often are dangerous to public health.

"All Are 'Increased'"

According to the results of chemical analyses of representative samples:

1. The calcium content appears relatively increased in the water of the National Park area, as well as in the areas of Syngrou Boulevard, Kerameikos and Metaxourgeion.
2. The manganese content is generally increased (except in the water in the Hilton Hotel area), with the highest content index in the water of the Court Mansion area.
3. Particularly high is the content of sodium, chlorium and sulfur detroxide in the water of all areas while the content in carbonic acids is extremely high.
4. In the samples analyzed, the content of nitrogen trioxide as well as of ammonia gas appeared to be particularly high.

The IGME study states that the particularly increased content of sodium, potassium, sulfur tetroxide and nitrogen trioxide as well as the strong presence of nitrogen dioxide and ammonia in most samples indicate that the water-carrying areas are highly polluted by city wastes and refuse. The experts give the following interpretation:

If the water of the water-carrying area came only from the rainwater that penetrates the soil, then it should show a very small content of the above elements because of the fact that the rainwater moves almost exclusively through shale and does not have the possibility therefore of being enriched with various types of salts.

Large Outflows

According to the experts the wastes and refuse from the capital's sewage system are among the factors which feed substantially the subterranean water-carrying area and, they point out, this outflow seems to be exceedingly high. They add that there are outflows also from the water supply network and that such outflows must be considerable in areas where the network is old. In their opinion these leakages from the two systems constitute to a large extent the creation of a broad water-carrying area which, despite the meager rainfall in the area and the aridity of its climate, is able to exist during the whole year even at the sloping sites of the capital's soil.

In another part of their study, the experts point out that the composition of the water in the Athens subsoil may affect the various buildings being constructed, a fact which the study warns should be taken into consideration.

The samples tested were taken from various parts of the capital and especially from excavations in lots located at: 99 Vasilisis Sofias Arenne, 22 Ypsilandou St., 3 Korai St., 4 Domakou St., Alexandras Boulevard (Court Mansion), 68 Peiraios St., Akhileos-Kolonou, 97 Syngrou Boulevard and National Garden.

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GREECE

TRAGIC EFFECTS OF POLLUTION IN ELEVSIS REPORTED

Athens TA NEA in Greek 1 Jun 78 p 1

/Text/ The incidence of illness, mortality, respiratory diseases and, most tragic of all, births of abnormal babies has more than doubled in the Elefsis area during the past 15 years according to M. Levendis, mayor of Elefsis and president of the Thriasian Pedion Association of Municipalities and Communities. He made this observation during a broad conference on pollution with the participation of tens of representatives of organizations, state authorities, citizens, industries, etc. In his introductory remarks he said, among other things, that "even the heredity of the area's people has been affected by the continuing pollution."

Portier, the French expert of the Union of Mediterranean Cities, said characteristically about Elefsis: "What is going on here is a crime."

The portable /monitoring/ station of the Ministry of Social Services has registered the highest index ever shown with regard to the dust in the atmosphere while the indices for calcium and iron are the highest ever registered internationally.

Lack of Sewage

The sea is full of poisonous materials which have literally turned it into a dead sea. Levendis referred to the state's indifference and the repeated--without results--promises given by the authorities. He pointed out that "the pollution of the Thriasian Pedion is a Panhellenic problem. At the same time he recommended that "a Panhellenic agency for the protection of the environment" be established.

These pollution problems have made the living conditions of the Elefsis residents worse what with the lack of sewers, flood controls and sound hospital relief. Levendis asked also that the steelworks and the Niarkhos shipyard stop filling up the sea with earth and that the 500 stremmas of the gunpowder factory be transformed into a park. He finally appealed to President of the Republic K. Tsatsos to lead a Panhellenic campaign to protect the environment.

The next speaker was chemical engineer G. Ambatzoglou who mentioned specific data concerning the degree of pollution of the Thriasion Pedion. He stressed the following: The main source of pollution is dust, the percentage of which in Elefsis is three times that considered tolerable by the World Health Organization. Four years ago the Ministry of Civilization and Sciences recommended the moving of the industries--to a distance of 2 kilometers--from places of residence, the replacement of filters of the industrial plants and fixed the maximum limit of harmful operation in the dust filters to 36 hours. None of these recommendations have been implemented thus far.

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GREECE

MEASURES TAKEN TO CLEAN UP SARONIKOS AREA

Athens ELEVTHEROTYPIA in Greek 25 May 78 p 15

/Text/ The Ministry of Industry and Energy has adopted a number of resolutions for drastically limiting air pollution and for cleansing certain Saronikos /Bay/ areas where pollution is on the rise. Specifically:

First: An order has been given to establish mixed crews of special employees from the Ministries of Industry and Public Works which will take an inventory of all industries along the Kifisos /River/ and its tributaries and will pinpoint those industries which cause pollution of the environment by emptying their refuse and wastes in the river.

Second: The Public Power Corporation was ordered to replace within 2 months the crude oil (mazut) containing 3.5-4.0 percent sulfur which it is using for the operation of the thermoelectric station at Keratsini with mazut having at most 1 percent of sulfur content. An order has also been given to locate all the industries in the /Attiki/ basin which use the same type of mazut.

Measures for Limiting Pollution

Third: For limiting the pollution of Eleusis and its shores the following decisions were reached.

- a. The large industries of the area will be compelled to install anti-pollution systems.
- b. The smaller industries will empty their wastes in a central waste-cleaning station to be installed in the area.

Fourth: The maintenance of the heating installations in offices and homes, etc., is being systematized further in order to limit to the minimum possible the pollution of the air caused by the ineffective operation of these installations. But, since a large number of specialized technicians is needed for such a project, the minister of industry asked the minister of labor to explore the possibility of organizing special courses for training as quickly as possible technicians for the installation and maintenance of heating furnaces (burners).

GREECE

PROVISIONS OF DRAFT LAW ON ENVIRONMENTAL POLLUTION

Athens TA NEA in Greek 5 Jun 78 p 14

/Text/ The draft law on environmental pollution provides special care and protection by the state of urban regions, publicly used areas, forests and parks, archeological areas, etc. It also forbids the establishment of new installations as long as there is a possibility that despite the application of appropriate measures the aforementioned areas may be affected.

On the other hand, the possibility may arise for proclaiming certain areas as "environmentally saturated" since an increased industrial activity in these areas may endanger the ecological balance. The law will apply to types of industrial installation, heating furnaces, automobiles, etc.

Special Permit

A special environmental permit will be needed for new installations of high and medium emission of pollutants. For the old installations the allowable limits of emission may be more lenient. For those of high and medium emission of pollutants a date for readjustment will be given.

In the meantime, on the occasion of today's observance of the World Environment Day, Minister of Industry and Energy Evert said, in part:

"This day was instituted in order to make as many people as possible aware of the fact that the environment is the space in which man lives and that without it he cannot survive. Within the framework of the observance of this day the Merchant Marine Industry has scheduled various informative events, while the Greek post offices will stamp all mail today with a special stamp bearing the motto: "Protect the Sea."

In a message to all Greek seamen, Minister Emm. Kefalogiannis stresses the importance of protecting the sea environment. Also, Civilization and Sciences Minister G. Plytas points out the importance of the struggle for the protection of the environment.

Charges

The administrative council of the Athens University Biology Students Association has made certain charges about the pollution of the environment. In a statement, it specifically charges that:

- a. In Eleusis the bottom of the sea has been covered with slime seven times greater than the specifications of the World Health Organization allow .
- b. The Ilisos and Kifisos Rivers empty daily into the sea the polluted slime of the Attiki factories. The same is true with the Thermaikos Bay.
- c. The Aliverion, Megaloupolis, Ptolemais and other areas are polluted.
- d. In almost all Saronikos Bay the varieties of sea life have been limited.

The Student Association asks: "What does the state do about all these cases? How does it put to good use the extant scientific potential?"

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NORWAY

LABOR PARTY SPLIT ON ENERGY ISSUE

Oslo AFTENPOSTEN in Norwegian 3 Jun 78 p 2

[Editorial: Energy Dispute in Labor Party]

[Text] A few days after the parliament has completed discussion of the Orkla/Grana development with a bitter, inner settlement in the Labor Party, the basis for a new energy battle is being laid in the governing party. The somewhat terse but nevertheless clear words of Gro Harlem Brundtland, minister for Environmental Protection, that Veig and Dagali will not be developed, but rather protected, have already brought reactions from members of her own party. The minister has tried to give the impression that the national meeting of the Labor Party actually approved the protection of the bodies of water. Obviously she knows that this is not correct, and that large sections of the national assembly voted for the compromise suggestion just because the demand for protection was not fixed in the program. The Deputy Chairman in the Labor Party's parliamentary group, Rolf Fjeldvaer, who was one of the main negotiators in the settlement between protectionists and developers in the Orkla/Grana affair, puts it clearly: The Labor Party has not adopted protection of Veig and Dagali.

But there is much that indicates that the minister for Environmental Protection wants a victory in this matter. Time after time, not the least in connection with the Orkla matter, the minister has emphasized that the will for protection on the part of the Labor Party and of the government cannot be taken out of individual matters. One must consider development and protection over a period of time as a unity, she insists. Up to now there has been generally more emphasis on development. Soon there must be decisions for protection, if the Labor Party's energy policy is to be at all palpable to moderate protection circles. It is regrettable that the struggle in the Labor Party over individual bodies of water has not brought us one single step closer to the job of forming a suitable Norwegian energy policy. A unified complete energy policy is lacking. To a great extent, oil policies lack perspectives beyond the academic debate over 90 or 75 or 50 million tons of yearly production. The discussion of nuclear power has been put off, and the matter of thermal power is undecided. But there is therefore, a struggle over individual bodies of water, together with the belief that energy policy is formed in this way. This is not good enough.

The Labor Party has been one of the few parties which has seen the need for a future-directed energy policy, which along with protection of resources has also seen the need for a stable and sufficient energy supply. We hope that this somewhat disrupting struggle does not paralyze the party at a time when energy policy discussions are necessary. In this case, the debate over Orkla/Grana has been of little value. It has given little indication of what alternatives there are to protection. We fear that the same thing will happen when Veig and Dagali come up for debate. Let us hope that the debate can take place with future perspectives as its foundation, and - no matter which side one takes - with the clear undertone: alternative energy is necessary if water development is to be halted. If one wants protection of bodies of water, one must also want alternatives. In the foreseeable future, these are thermal power and nuclear power.

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NORWAY

BRIEFS

MICRO-ORGANISMS IN OIL CLEAN UPS--Two Norwegian researchers want to enlist the aid of organisms which live in the sea in detecting oil pollution. They have found that some marine organisms are capable of absorbing oil components in such a manner that after a while they achieve a content which is increased in relation to the amount of hydrocarbons found in the water. Such organisms can therefore be used to check for oil pollution in sea water, and the two researchers have developed a method of discovering beginning pollution very early, according to NORSK OLJEREVY. They have experimented with several types of important organisms, including mussels, rur [translation unknown], albueskjell [translation unknown], and star fish. The two researchers, Jan B. Boler and Froydis Oreld, of the Central Institute for Industrial Research in Oslo, predict, that the new surveying method will have increased importance in the coming years. It covers an aspect of oil pollution which cannot be approached by other methods. The method also has great usefulness now when both the authorities and industry want to keep track of the leakage of oil in the marine area, according to NORSK OLJEREVY. [Text] [Oslo AFTENPOSTEN in Norwegian 3 May 78 Evening Ed p 1, 10] 9125

CSO: 5000

BUNDESWEHR'S ENVIRONMENTAL POLICIES, PROGRAMS OUTLINED

Frankfurt/Main SOLDAT UND TECHNIK in German Jun 78 pp 291-292

[Article by Peter Zimmermann: "The Bundeswehr and Environmental Protection; On the Occasion of Environment Day, 1978"]

[Text] The United Nations has designated 5 June as International Environment Day. This is the anniversary of the opening of the UN Conference on the Environment on 5 June 1972 in Stockholm. To date, this has been the biggest scientific conference sponsored by the UN. It impressed upon the world's population the inevitability and the urgency of global environmental problems. It further emphasized that apart from national efforts there is a need for international collaboration and detailed international policies if global environmental protection is to be achieved. Since then, International Environment Day has been celebrated annually in the FRG; since 1977 the Bundeswehr has also been involved in program arrangements.

The Bundeswehr's Attitude Toward Environmental Protection

The Bundeswehr no longer argues whether or not to practice environmental protection. It has made up its mind and participates actively in the FRG environmental activities. The decisions leading to that attitude were made relatively early. They can be demonstrated by organizational measures which were taken. After the formation of the cabinet committee on environmental protection problems, by decision of the Federal government on 6 July 1970, the Minister of Defense joined this "environmental cabinet" on 11 August 1970. According to a law dated 26 August 1970, a senior representative of the Defense Ministry was for the first time charged with the task of appointing an environmental executive within the BMVg. An organizational regulation dated 27 July 1973 established within the division of social affairs the section S 17, "Environmental Protection in the Bundeswehr." Since 1974 one could observe a continuous growth of the environmental activities office within the BMVg. A law dated 19 August 1974 made the presidents of the military district administrations responsible for environmental protection within their respective military district. A further law dated 8 July 1975 gave the administration responsibility for overlapping tasks involving environmental protection to the department

II A 3 within each military district administration. In the summer of 1977 the Chief of Staff of the Army directed in an order that the military district commands were to cooperate with the military district administrations in meeting their tasks having a bearing on environmental protection matters as part of their standing orders ZDv 40/1. In the armaments area, the government agency for Defense Research and Procurement charged its department AT IV 4 with the responsibility for environmental matters by decrees issued in 1971 and 1972.

Reasons

The reasons for these developments and for the Bundeswehr efforts to arrive at a meaningful relationship with the environment phenomenon occurred at several levels.

The Minister of Defense is a member of the Federal government and in this capacity participated in the genesis of governmental environmental protection plans from 1971 to 1976. He thereby carries partial political responsibility for national environmental policies in the FRG and for the development and execution of both environmental programs. A reticent or defensive attitude toward environmental protection by the defense department would ignore political realities and would not demonstrate the type of loyalty which must exist among the major components of a government.

Additionally, the Bundeswehr is an integral part of society. If it wants to continue in that role, it must participate in sociopolitical developments and contribute thereto. This is true for environmental protection as well. During the past eight years, environmental protection has become a sociopolitical reality. No part of our society can afford to ignore it without being held accountable. This is true for the political parties, the economy, the Bundeswehr and any other organizations or groups. This requirement becomes more evident if one tries to recognize the order of magnitude which the protection of the environment has by now assumed within the FRG.

Environmental policy has by now become a self-contained public issue within the FRG. The protection of the quality of human life has equal importance with other public concerns, such as social security, educational policy, internal and external security.

There is in existence a systematic environmental law of the Federal government, which was formulated following the expiration of the Federal environmental program in 1971. This enabled the government in its new environmental program of 14 July 1976 to designate new points of emphasis. It maintains the political evaluation for environmental protection, with particular reference to the economic difficulties which started in 1971. It regards the following as points of emphasis: the enforcement of the now existing environmental law; the law's finalization; and increased attention to environmental requirements in construction planning of all types. This

serves notice on every sector of society in the FRG that environmental standards created by the environmental laws must be observed. The new environmental law thus requires a general reorientation.

The development of public environmental organizations within the Federal and state governments is largely completed. At the Federal level, the Ministry of Interior has management responsibility for environmental protection. In addition, there is since 1974 the Environmental Agency in Berlin.

Within the states, environmental protection is also represented at the ministerial level, partially even in separate environmental ministries. In addition, there are state agencies for environmental protection and in some cases environmental representatives at the city level.

Environmental protection has become a separate scientific entity. Among its members are the federal and state environmental management representatives, but also scientists and technologists from the academic and economic areas. Industry has also increasingly become active in environmental protection. Many large private enterprises have their own environmental departments which seek to develop new technologies dealing with the environment.

A lot of money is being spent on environmental protection in the FRG. Inquiries show that between 1970 and 1975 66.7 billion DM were used for environmental protection purposes in public and private industrial funds for new installations and operating expenses. For the period 75 to 80, this study estimates the figure to increase to 112.8 billion DM.

It is remarkable to what extent environmental protection attracts idealistic attention at many levels of the population. The average citizen is well informed on the subject and is of the firm opinion that the government and the economy must pay more attention than heretofore to his rights for a good quality of human living conditions in their plans and activities. The citizen is ready also to support environmental causes and to engage in controversy over them. Environmental citizen initiatives have sprung up everywhere. These groups have even organized themselves at the state level and in a nationwide coalition of citizens' environmental protection associations. Their acquired ability for systematic and highly successful intervention has been significantly demonstrated in the area of nuclear energy. Most recently, environmentalists have nominated their own "green" candidates in political elections outside the regularly established political parties and have managed to get some of them elected. While this has so far been true only at the community and county level, there is already talk about the possibility of environmental protection parties at state and the Federal level. The political viability of such parties is open to question. But it is of interest that it has at least become a theme for political controversy within the FRG.

There is an even more pragmatic reason for the Bundeswehr to come to terms with environmental protection in a meaningful manner. It constitutes not only a group of obstacles to its tasks caused by observance of the new environment laws, but also considerable favorable opportunities. Inasmuch as environmental protection is very much on the public mind, there is an opportunity, by proper attention to environmental matters, to direct public opinion toward a sense of responsibility on the part of all defense activities. In addition, a positive attitude by the defense community is commensurate with the latter's understanding of its responsibilities regarding environmental disturbances caused by its own operations. The public has become sensitive to such disturbances. Statements to the effect that such occurrences are unavoidable in performance of the constitutional responsibilities of defense activity and must be accepted by those affected, are now much less accepted than was the case in the past. It has become necessary to be able to demonstrate to the complainants that the Bundeswehr does not only impair the environment in connection with its activities, but that it in fact actively participates in environmental protection activities in a significantly successful manner.

Bundeswehr Contributions to Environmental Protection

But what might these positive contributions be? It is certainly insufficient to state that the minister of defense, as a member of the government, carries partial political responsibility for the environmental laws and programs, under the management responsibility of the minister of the interior. Neither is it sufficient to mention that the Ministry of Defense collaborates with the Ministry of the Interior in the departmental determination of the development of concepts, plans, and proposed laws. Finally, it is not enough that environmental laws are complied with in the defense sector. These laws often contain exceptions for the Bundeswehr, a fact of which the public is becoming increasingly aware. What is more important than all the foregoing is the fact that within its own sphere the Bundeswehr takes specific measures to adapt itself to the requirements of the new phenomenon of environmental protection. This must not be exaggerated to the point where the Bundeswehr would change its entire modus operandi or that the execution of a constitutional defense task would become impossible. Whoever wishes to practice environmental protection within the Bundeswehr still remains a member of said Bundeswehr; this gives him the primary responsibility to contribute to the main mission: to assure the defense of the country in accordance with the constitution. Therefore, active environmental activity within the Bundeswehr must be based on its primary mission and must serve to practice as much environmental protection as possible while simultaneously executing the defense task. This can be accomplished.

A significant contribution to environmental protection by the Bundeswehr presupposes recognition of its own capabilities in that respect and an admission that certain overlaps exist between defensive tasks and environmental protection. This gives rise to the following thoughts:

The ultimate objective of the Bundeswehr is not the protection of the environment, but the defense of the country in accordance with the constitution. Environmental protection is therefore in the first place an interfering side issue. Effective and immediately available armed forces can be created much more easily and cost-effectively, if that is their sole objective, without simultaneous attention to environmental matters. This conflict with environmental protection requirements exists not only for the Bundeswehr. It has this in common with other concerns of the government, which deal with public needs other than environmental protection, e.g., transportation/railways, the mails, border protection, and police.

On the other hand, constant fulfillment of the defense task constitutes in and of itself a contribution to environmental protection. The avoidance of military confrontation itself avoids enormous "environmental damage" due to war.

Obviously, the necessary peacetime military operations of the armed forces cause environmental impacts. But these disturbances, relative to the overall environmental impairments taking place in the FRG, are relatively insignificant. On the other hand, certain environmental impacts caused by the Bundeswehr are not only noticeable, but even spectacular, e.g., military aircraft noise, tank maneuvers, firing ranges, etc.

These basic considerations lead to two environmental goals which can and will be practiced by the Bundeswehr. To begin with, the Bundeswehr wants to reduce to the absolute minimum those environmental impacts which are caused by militarily necessary peacetime operations. All those things which are not essential to successful training efforts necessary for peaceful operations are avoidable. This objective signifies a voluntary limitation of the defense sector which partly greatly exceeds the limitations required by current laws.

In addition, the Bundeswehr is in a position to support the Federal government in its efforts to execute and extend its environmental laws, by initiating appropriate measures in its own domain. One of the goals to be approached by the Federal government's environment program is the creation and emphasis upon an environmental conscience by the public. The Bundeswehr plans to assume the role of a part of the public for this purpose and will attempt to generate an environmental conscience within its own ranks through appropriate and cost-effective measures. The end objective is to generate within each member of the armed forces the capability of performing his tasks while consciously considering its environmental aspects. He will be required to avoid any environmental impacts which are not strictly necessary in the performance of his duties.

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