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The "Decade of the Environment" in the U.S.S.R.

Philip R. Pryde

Ten years ago there appeared the first American monographs having as their goal the establishment of the status of environmental protection activities in the U.S.S.R. (*1*, *2*). Their conclusion, based on a systematic review of the major categories of natural resources, was that the state of the environment in the Soviet Union was not significantly different in most respects from that in the United States. In both countries environmental protection and the prudent use of natural resources is accorded a high official priority; in both countries major pollution and waste problems arise more from the inherent nature of economic processes than from the country's political or economic system; both countries are working to reduce waste and pollution as much as possible; and both countries are finding the latter difficult to accomplish because of the high cost of pollution abatement measures or an inadequate level of field inspection and enforcement.

The objective of this article is to examine the state of resource conservation and environmental protection in the U.S.S.R. at the beginning of the 1980's, as compared to the early 1970's. Without question, much environmental improvement took place in the Soviet Union over the past 10 years, but in what areas were significant advances realized and in what areas not? In the United States, the 1970's were the "decade of the environment"; was this also the case in the U.S.S.R.?

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Economic Imperatives

Both environmental degradation and environmental improvement normally take place at a slow but steady pace, often involving imperceptible changes over a short time span. In the Soviet Union in the 1970's, however, these changes were influenced by two economic events of particular concern. The first was a general downturn in what had been for three decades an unbroken and vigorous rate of industrial expansion (from about an 8 percent annual increase from 1965 to 1970 to about 4½ percent from 1975 to 1980). The second was the worldwide energy crises of 1973 and 1979, from which the Soviet Union was not entirely isolated. Both events have given new impetus to the subject of resource conservation in the U.S.S.R. and will help put the rest of the discussion into perspective.

The downturn in average annual rates of increase in Soviet industrial production has been accompanied by a clearly stated need to improve the efficiency with which natural resources are used. Soviet spokesmen acknowledge that such improvement would not be difficult, and the 1972 studies cited many lamentations in the Soviet press over wasteful practices in such industries as petroleum extraction and timber harvesting (*1*, pp. 96–106). Particularly common were the burning off of large quantities of wellhead gas and the carrying out of inadequate reforestation measures. The situation apparently has improved only marginally, and leading journals still frequently protest, for example, the waste of natural gas that accompanies the extraction of petroleum and coal (*3*).

The situation prompted a front page article in *Pravda* in 1981 (*4*) which presented a resolution calling for more efficient use of natural resources. It was frankly stated that "compared to the best world indices, we expend greater amounts of raw materials and energy per unit of national income. . . . [T]he CPSU Central Committee and the USSR Council of Ministers consider it necessary to fundamentally improve all efforts to economize and make efficient use of raw materials, supplies, fuel, and power in all branches of the national economy" (*4*). As one response to this, an increased emphasis on recycling, especially of newspapers and municipal wastes, has taken place in the past 10 years, paralleling similar efforts in the United States.

The cause of the inefficiency problem in the Soviet Union has not changed since the 1972 studies; it derives from the situation that resource users are rarely resource owners (precluding incentives for long-term good management practices), and that resource exploiters cannot independently develop uses and customers for by-products of their operations. Since these problems are associated with the basic nature of the Soviet economy, major improvements may be realized slowly.

If conservation of mineral resources generally has become of concern, conservation in the specific area of energy resources appears to be a matter of critical importance. In 1981 at least a dozen major articles appeared in key Soviet publications explaining and inculcating the need for energy conservation, and outlining government plans and policies to bring it about. At first this might seem odd in the most energy self-sufficient of all the industrialized countries. However, the Soviet energy picture is not as sanguine as it seems at first. The main Soviet oil fields in the Volga-Ural complex have peaked, and the large new fields in West Siberia are being brought into production only at great expense (*5*, pp. 45–61). Natural gas is plentiful, but the main reserves are also in inaccessible areas of northern West Siberia, and the necessary transportation infrastructure has not yet been completed. Coal reserves, while extensive, are becoming more costly to extract from the underground mines of the Ukraine, where production is falling, and are costly and slow to develop in the open pit mines of Kazakhstan and Siberia. Coal production, originally envisioned to increase from 701 million to 805 million tons between 1975 and 1980, actually increased only from 701 million to 716 million tons in those 5 years (*6*).

Thus, energy supplies are far from abundant at the start of the 1980's in the U.S.S.R. As a result, the leading Soviet newspapers and planning journals have stressed repeatedly the need to conserve energy, a topic that was almost totally absent from the literature at the start of the 1970's (*4, 7, 8*). *Izvestiya*, in fact, while noting the large increases in energy production planned for the 11th Five-Year Plan (1980 to 1985), stated that "nevertheless, the national economy's requirements for fuel and power can be satisfied only if significant amounts of these resources are conserved" (*7*). Thus, the large fossil fuel reserves of the Soviet Union have not automatically led to abundant domestic energy supplies, nor precluded a need for stringent conservation efforts.

A third event of significance during the late 1970's was the appearance of the volume *The Destruction of Nature in the Soviet Union*, by Boris Komarov (*9*). "Boris Komarov" is a pseudonym; the real author is presumed to be a high official in a key Soviet ministry. First published in West Germany in 1978, it has caused considerable comment wherever it has been read. Its authenticity has not been questioned since it contains much material that would be inaccessible to Western authors. It provides an unprecedented glimpse into the nature of environmental politics in the U.S.S.R., and constitutes a serious indictment of Soviet environmental protection activities. Komarov is equally critical of efforts toward the conservation of water, atmospheric, land, and biotic resources as well as of the level of enforcement of the laws that have been passed to protect them. Rather than review the contents of the book in more detail at this point, references will be made at appropriate places in this article to Komarov's insights into the situations being discussed.

Summary. The decade of the 1970's was for the U.S.S.R, as for the United States, a period of increased awareness of environmental deterioration. In response, new laws were passed, pollution control funding was increased, and natural resource conservation was heavily stressed. Despite such good intentions, the cumulative effects of new technologies, inadequate budgets and enforcement, the primacy of production goals, and various institutional impediments resulted in an uneven and in some places inadequate level of environmental enhancement.

Lake Baikal

In reviewing the state of Soviet conservation practices in 1982 as compared to 1972, one cannot but be impressed by the number of issues that have remained current during the decade. In 1972, among the major conservation issues in the U.S.S.R. were Lake Baikal, the "Caspian Sea problem," poaching, land reclamation, and the broad topics of air and water pollution. All of them continue to receive attention in the Soviet press, as do the earlier mentioned use of timber and mineral resources.

Lake Baikal, the deepest and most biologically unique lake in the world, has had its extraordinarily clean and transparent waters deteriorated by effluents from two large pulp mills built on its shores. Although advanced treatment plants have been built at the Baikal'sk and Selenginsk pulp mills, the treated effluent that enters the lake is far from being as clean as the exceptional lake water itself. Thus, a controversy continues to exist over the long-term effects on the life of the lake. In 1977, a U.S.S.R. Academy of Sciences report on Lake Baikal suggested that "the danger of Baikal being destroyed had increased rather than decreased, that the entire Lake was on the brink of irreversible changes," and that the initial link in the lake's food chain, the crustacean *Epishura*, could be killed even in water where the treated effluents were further diluted by a factor of 100 (*9*, pp. 6 and 10). The director of the limnological institute at Lake Baikal states that effluent violations at the Baikal'sk plant occur "on a virtually continuous basis" and that Lake Baikal "is being progressively polluted" (*10*). In addition to chemical pollution, there is continuing concern over biological pollution resulting from timbering operations and from the transport of logs on and around the lake. In addition, oil has been found in the vicinity, and tens of thousands of tons a year are transported over the lake.

An underlying reason for the gloomy outlook (*9*, pp. 6 and 10) can be found in the decidedly utilitarian approach to the natural environment espoused by many senior Soviet planning officials and even academicians. P. L. Kapitsa, one of the Soviet Union's best-known scientists, defended the pollution of Lake Baikal as follows (*11*):

> [T]he value of Lake Baikal does not lie simply in the abundance of clean water, but in the fact that it functions as a biological filter of tremendous capacity producing clean water. The water that enters the lake is much dirtier than the water that emerges. This purification is the result of biological processes in Baikal. . . . The industrial significance of Lake Baikal lies in the fact that it represents a huge purifier of water, and our concern should be directed toward preserving that capability. It is therefore wrong to say, 'Don't touch Lake Baikal.' The lake should be exploited, but so as not to disturb its life processes or interfere with its water-purifying properties. We must therefore know how and to what extent Baikal may be polluted so that it may continue to process dirty water and yield clean water.

Soviet authors quoting Kapitsa added to this, "in short, pollution of the natural environment, up to a point, is just as necessary as the very existence of the environment" (*12*). But none of the writers noted the difference between the simple biodegradable organic matter whose nutrient residues form the "necessary pollution" of which they speak and the thousands of tons of nonbiodegradable sulfides, chlorides, lignins, phenols, and mercaptans that the pulp mills deposit in Baikal. This is curious, as the scientific credentials of the writers are of international renown. In any event, industrial development proceeds with vigor around Baikal, and after two decades of official concern, this magnificent lake's biological future must be considered far from secure.

Other Water Problems

In other areas where water pollution was an issue a certain amount of improvement has been realized. Primary (and in some cases secondary) treatment plants are now found in most large cities, which was not true at the end of the 1960's. I found the Volga and Moskva rivers to be cleaner in 1978 than in 1967, although growth of green algae, perhaps caused by the nutrient by-products of treatment and suggesting oxygen depletion, was strongly evident during the summer months. Overall, industrial pollutants seem to be more of a problem than municipal ones. During 1980 alone, *Pravda* carried numerous articles spotlighting instances of contamination of lakes, rivers, and even subsurface water supplies. The problems are exactly the same as in 1972: insufficient developmental capital and a low priority given to the upkeep of the plants that are built. For example, a recent inspection of water treatment facilities in Saratov oblast (province) found that half of those that had been built were not operating effectively (*13*). Here, again, the utilitarian approach to conservation was evidenced by an article in *Pravda* on the relation of organisms to polluted water which concluded that "there is another very important task, and that is to restore shellfish populations and perhaps even breed new species that are more pollution resistant and have greater purification capacities" (*14*). In addition, oil spills occasionally occur. On 21 November 1981 a British tanker broke up in a storm near the Lithuanian port of Klaipeda, spreading oil over 35 miles of resort beaches and causing almost $1 billion in damages (*15*).

Another long-standing problem in water resource management is the management of water quality and quantity in the Volga-Caspian basin. Although positive steps have been taken, such as the elimination of direct discharges from ships and the expenditure of 400 million rubles in water treatment facilities in the Volga basin, the situation remains that "pollution is a very serious problem in the Caspian," the main causes being oil drilling, pesticide residues, and heavy metals (*16*). The situation was acute enough that a special resolution to prevent further pollution of the Caspian was enacted by the Council of Ministers in 1977 (*17*).

Pollution is the immediate problem, but an even greater long-term problem is the reduction in the surface level of the Caspian Sea due to the creation of upper basin reservoirs and lower basin irrigation projects. As a cure, massive additional diversion schemes have been proposed to bring water from northern European rivers to the Volga and from West Siberian rivers to the Caspian Sea. Most of these schemes had been proposed before 1970 and were discussed earlier (*1, 2*), but they have engendered considerable research in the last 5 years on the environmental consequences of such massive alterations of hydrologic regimes. The scope of this environmental research and prediction, carried out in the main by the Institute of Geography and other associated institutes of the U.S.S.R. Academy of Sciences on a wide range of projects, far exceeds that conducted in the past (*18*). This may represent a new trend in Soviet environmental management.

Part of the reason for the interest in the diversion of West Siberian rivers is that this would help cure a related problem, the drying up of the Aral Sea. Here it is irrigation diversions from the Amu-Darya and Syr-Darya rivers that are causing the problem, which has become worse in the past decade. Part of the debate is whether it might be acceptable to let the sea completely dry up, but most writers feel that at least a minimum amount of water should be allowed to remain in the Aral Sea (*19*). The diversion of water from the Ob-Irtysh river system southward would be an enormous project, and illustrates a continued Soviet propensity toward massive solutions to environmental problems.

A relatively newer issue of similar scope concerns the fate of the Sea of Azov. Although not a landlocked water body like the Caspian and the Aral, it is nevertheless of low salinity because it is fed by the waters of the Don and Kuban rivers, and its shallow and rich waters have always sheltered a major fishery. But it, too, is being transformed by increased salinity due to reduced flow from the Don and the Kuban, and complex measures are being formulated to protect the economic values that these fisheries represent (*20*). The basic lesson to be learned from all the cases above is that in the Soviet Union, as in the United States, there is a price to be paid by posterity for inadequate planning associated with major landscape transformation projects.

Air Quality

In the area of air quality, the situation is similar to that described above for water. Millions of rubles have been spent for air pollution abatement. Still, the rapid pace of Soviet industrialization keeps bringing new sources of emissions into play, including a rapidly increasing number of automobiles. Not only heavy industrial cities but even such republic capitals and tourist cities as Alma-Ata, Tashkent, Bratsk, Yerevan, Dushanbe, and Frunze have been the subject of recent air pollution articles in the Soviet press. The location of most of these cities in sunny, arid climatic regions suggests the emergence of photochemical smog as a problem, and in fact I was queried on this subject while in Alma-Ata in 1978. Why the Soviet Union is using limited resources to mass-produce automobiles after it has spent billions to create an excellent public transportation system is a question that not even Soviet specialists could answer. But as a result, major Soviet cities may be hard pressed to even maintain the status quo in air quality, and Komarov states that maximum permissible concentrations of carbon monoxide in some areas of Moscow, supposedly a model environmental city, at times are exceeded by 20 to 24 times and "constantly [are] exceeded [by] 10 to 13 times" (*9*, p. 28). Indeed, in one inspection of 310 diesel trucks entering Moscow, "half of them were producing so much smoke that it couldn't be measured" (*21*).

It should be noted in this regard that there is a basic difference in approach to setting pollutant standards in the Soviet Union and the United States. Here, standards are set at what are expected to be realizable levels, and compliance is sought. In the Soviet Union, standards (maximum permissible concentrations) are very stringent, and as a result are often not met. Which is the more realistic approach is arguable, but the Soviet system allows the U.S.S.R. to claim the

world's toughest air quality standards (*22*). To help implement these standards, the Soviet Union passed a national air quality act which went into effect on 1 January 1981 (*23*).

Legislation and norms are important, but an essential third element is money. Although billions of rubles were spent during the 1970's in the interest of cleaner air in the U.S.S.R., billions more are needed. Pollution abatement facilities are often not finished when factories open, older industrial plants frequently have very inadequate abatement, and the new sea of automobiles (and heavy-duty trucks as well) are often inadequately maintained; the result is a continuing struggle against air pollution. Using Soviet data, Komarov concludes that "for each unit of goods, the socialist economy produces twice as many air pollutants of all sorts, and each Soviet automobile poisons its environment almost four times as much as each American car" (*9*, p. 30). This conclusion appears to be supported by the quotation from *Pravda* cited above (*4*). Official intentions will need to be matched by more official subventions if further improvements in Soviet air quality are to be realized in the 1980's.

In an effort to reduce the volume of future emissions from fossil fuel power plants, as well as to conserve their reserves of such hydrocarbons, the Soviet Union during the past decade accelerated the development of one particularly significant new industry, commercial nuclear power plants. In 1970, they had just four such plants with a total capacity of 880 megawatts electric; by 1980 these figures had risen to 22 units and a capacity of 13,100 MW(e). Very large increases are expected in the 1981–1985 Five-Year Plan, with an official (and perhaps optimistic) goal of about 38,000 MW(e) of nuclear power in use by 1985. At present there are also two large breeder reactors on line, with plans to build still larger ones in the future.

The Soviet Union, unlike the United States, is committed to the fastest possible increase in the development of commercial nuclear power. They do not perceive it to be an industry having any insurmountable problems, and there is no organized antinuclear lobby. Apparently, their chosen method of disposing of high-level radioactive waste is deep burial (although at present most such wastes are probably stored at or near the surface), and they do not support the American idea of interment in salt formations.

A huge factory has been built in the city of Volgodonsk to mass-produce reactor vessels and has recently turned out its first finished project. These reactors, by the way, are of markedly different design from the large pressurized water reactors favored here. Called "channel reactors," they are made up of a large number of individual fuel channels, which can be shut down or replaced without shutting down the whole reactor. This design enhances plant safety, raises capacity factors, and allows for larger station size [units are planned up to 2400 MW(e)]. On the other hand, this type of nuclear plant takes up more room and has a lower energy conversion ratio

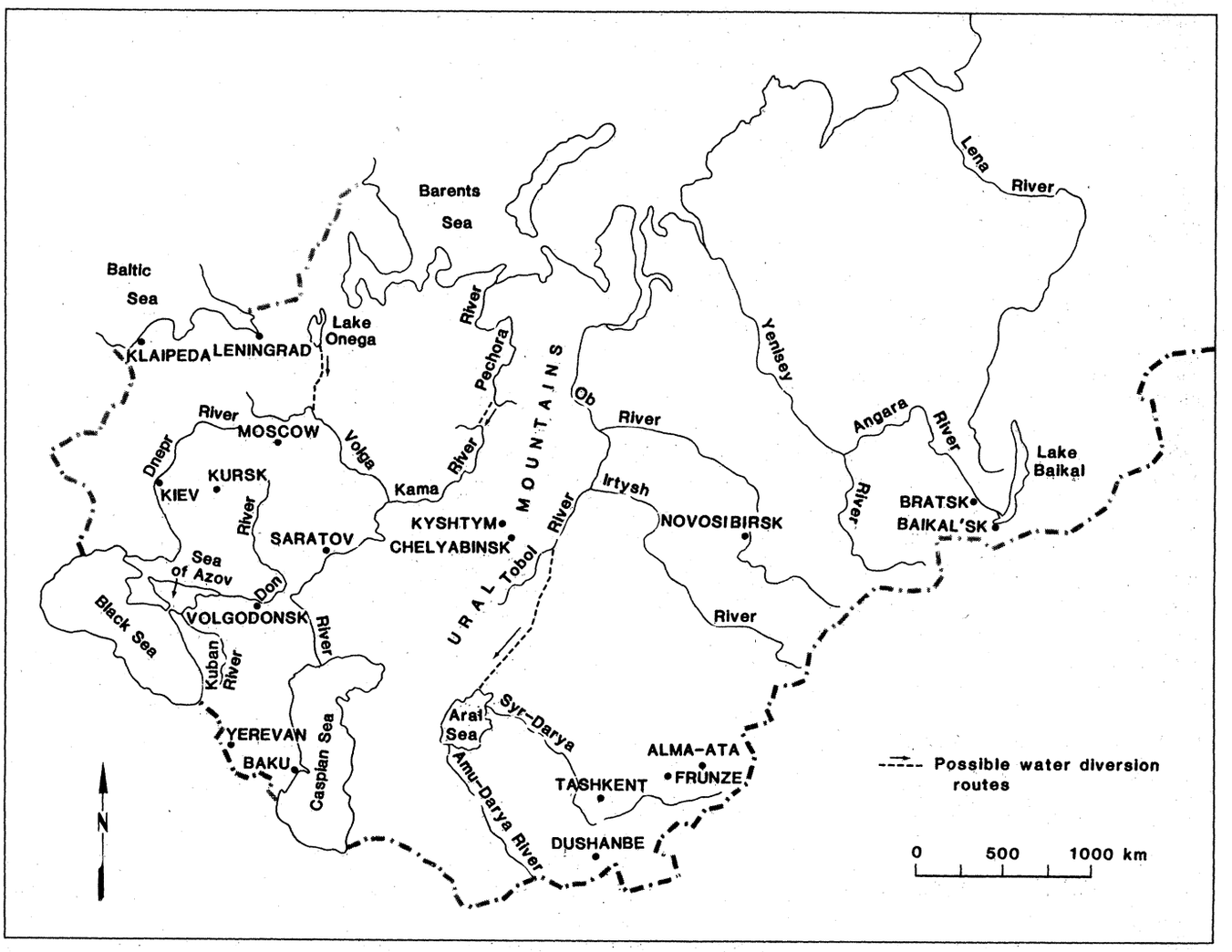

Fig. 1. Guide to locations in the U.S.S.R.

(about 31 percent) (*5*, pp. 151–170). The differences in both Soviet attitudes and Soviet design approaches to commercial nuclear power make this a very interesting area of comparative industrial development.

Also with regard to radioactive waste disposal, reports became available during the late 1970's of a reputedly major chemical explosion involving nuclear wastes that took place during the latter half of 1957. Occurring in the Kyshtym-Kasli area on the eastern flanks of the Ural Mountains (north of the city of Chelyabinsk), it reportedly contaminated with radioactive wastes an area of several hundred square miles, which, if this is accurate, would make it the worst nuclear accident in history. Although never acknowledged by the Soviet Union, it has now been corroborated from a number of sources, including one detailed book by an émigré Soviet scientist (*24*). More recent studies, however, suggest that sloppy management of high-level wastes, rather than an explosion, might have been the cause (*25*).

Biotic Resources

In the field of wildlife and habitat protection, several positive steps have been taken. As with air quality, the U.S.S.R. enacted a national law on the protection of wildlife, with a goal to "promote the effective production and rational utilization of the animal world and the inculcation in Soviet people of a solicitous and humane attitude toward the animal world" (*26*). This enactment provides national goals and guidelines for the protection and utilization of faunal resources and requires that all legislation passed by lower political entities (such as Union republics) must be in conformance with them. Many articles in the Soviet press over the past few years have spoken of the need for better management of hunting and trapping and suggested that there is a continuing problem of poaching of both ungulates and sturgeon (the latter for caviar). The Soviet Union has indicated a willingness to decrease its whaling activities, an area in which it has received considerable international criticism, and has begun cataloging in "red books" its rare and endangered species (*27*). On the negative side, in addition to poaching, occasional instances of pesticide misuse are still reported, and Komarov was particularly critical of Soviet wildlife management practices (*9*, pp. 75–90; *28*).

In order to help preserve wildlife and other significant components of the natural realm, the Soviet Union during the past decade enlarged its nationwide network of nature preserves (known as "zapovedniki") and began for the first time to create a small number of national parks. From a total of approximately 80 preserves that existed in 1970, the number had risen to 112 in 1978, and to possibly as high as 129 in 1981. In addition, there are seven areas designated as hunting preserves, and at least five (now maybe seven) areas were established in the 1970's as national parks (*29*). Similar protected areas exist at both the U.S.S.R. and republic level, and these also appear to be increasing in number. Also, in conjunction with the United Nations "Man and the Biosphere" program, the U.S.S.R. has designated seven of its major preserves as World Biosphere Preserves (*30*).

One other important aspect of land conservation is the reclamation of areas disturbed by surface mining. In this area, the Soviet Union, like the United States, seems to be running very hard simply not to fall further behind. The problem is that so many new surface mines are being put into operation that, despite the existence of mandatory reclamation laws, the total disturbed area is diminishing very slowly, if at all. One particularly troublesome area is the huge iron ore pits at the Kursk magnetic anomaly, located about 500 kilometers south of Moscow. Here 12 million cubic meters of black earth (topsoil) have been stripped and stored from 17,000 hectares of land, but the mining operation "has not returned a single cubic meter of stripped black soil to agriculture . . . it all lies piled in enormous mounds" (*31*). Considering that this area of loess soils is one of the most fertile agricultural regions in the country, the counterproductive nature of neglecting land reclamation becomes clear. Numerous complaints of a related nature have appeared in the press. Reclaiming surface-mined land is one area where little will happen without constant government supervision or funding, and these appear to be lagging in the Soviet Union today.

Because environmental problems are common to all industrialized countries, the Soviet Union over the past decade has greatly increased the frequency and scope of its international contacts and exchanges. In 1972, the U.S.S.R. and the United States agreed to a large-scale exchange of scientists, government officials, and scholars in a broad array of environmental research areas. As part of one such exchange in 1978, I had the opportunity to study Soviet efforts in environmental legislation and citizen participation (*32*). Since many types of environmental degradation are extra-national or even global in their effects, the greatest possible degree of international cooperation is an essential goal.

Discussion

During the decade of the 1970's several new thrusts appeared, or developed rapidly, in the area of natural resource conservation and environmental protection in the U.S.S.R. These included a strong emphasis on the conservation and efficient use of not only forest and mineral resources, as in the past, but now energy resources as well. As partial reflection of this, there has appeared an increased emphasis on advance environmental impact analysis and on the nuclear power industry. Several important new laws were passed during the 1970's, a Permanent Commission on Environmental Protection was established within the U.S.S.R. Council of Ministers (*33*), and new parks and preserves were created.

Some changes, of course, take place slowly. Among these, in the Soviet Union, are almost any form of alteration of institutional operations or attitudinal position. The Soviet predilection toward large-scale technological solutions to environmental problems can be seen both in their approach to the Caspian-Aral-Volga problem and in their emphasis on large nuclear power stations. The Soviet utilitarian approach to nature has been noted; this characteristic has long been present, beginning in the czarist era, but today statements such as Kapitsa's (*11*), quoted earlier, seem to be laying the theoretical justification for this approach. Finally, there are the institutional inefficiencies that result from the organizational nature of the Soviet industrial bureaucracy. Money is inadequately allocated, production quotas have implicit priority, supplies are delivered sporadically, interministry coordination is imperfect, and as a result environmental improvement projects are frequently completed years behind schedule.

A final example, cited by *Pravda*, illustrates the general problem well. It concerns a wastewater settling tank and storage tank that were built at the Saratov biochemical plant more than 10 years ago. The work was slipshod, the authorities did not accept them, and they have stood idle. It turns out, however, that even if the plant's treatment installations

were renovated, the local water and sewer administration would not be able to feed the effluents into the nearby sewer line because of system overloading. The article concludes, "According to present plans, this problem will not be solved before 1985. Does this mean, then, that the biochemical plant's untreated sewage will go into the Volga for yet another five-year period?" (*34*).

Industrial organization problems such as these were noted in 1972 in *Conservation in the Soviet Union* (*1*) and in many other works since, but unfortunately the ensuing 10 years have apparently seen little progress toward their elimination. One significant conservation step that has been taken, however, is the widespread introduction of fees for water use, reversing a long-standing position that, under socialism, water should be a free input into the economy (*1*, pp. 111 and 230; *35*).

The foregoing discussion suggests that environmental quality issues are of considerable concern in the U.S.S.R., that many improvements have been realized over the past decade, but also that there are still many unresolved environmental problems facing Soviet planners. The continuing existence of these problems is neither surprising nor discrediting in itself. Industrial societies inevitably create environmental challenges; the question is, to what extent do they assign a high priority and an adequate level of resources to keeping abreast of, and trying to gain on, these problems? Soviet specialists are keenly aware of the need, as well as the technology, for abating environmental pollution and disruption and, as noted, many gains have been realized. The problem is that the pace of new industrialization tends to equal the pace of increased pollution abatement (at least at present levels of funding), and pollution reduction targets often are not met. For example, a recent review of the 1976–1980 Five-Year Plan cited several ministries that fulfilled air pollution abatement plans by only 48 to 82 percent (*36*).

That this bears some resemblance to the situation in the United States is not at all surprising; environmental disruption is far more a function of levels of industrial and agricultural development than it is of a particular political or economic system. The record for both countries in the 1970's is one of considerable effort being barely able to keep abreast of expanding problems. Cleaning up these problems is primarily a function of political will, expressible as a trade-off between economic expediency (short-term cost saving) and long-term environmental productivity. Both the United States and the U.S.S.R. realize that there are limits to this trade-off, but budgetary demands are of paramount consideration in all societies. Without proper contemporary attention, however, environmental deterioration and postponed restoration costs alike can only increase, a burden to be borne by the future generations of both countries.

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