Energy Choices in the U.S.S.R.

The Soviet Energy System. Resource Use and Policies. LESLIE DIENES and THEODORE SHABAD. Winston, Washington, D.C., and Halsted (Wiley), New York, 1979. viii, 298 pp. $19.95. Scripta Series in Geography.

Soviet planners today squarely face a choice between two strategies for coping with declining growth rates of energy production. They can set out to woo Western technological cooperation to unjam the bottlenecks besetting the energy industry. Or the Soviet Union can turn inward. By withdrawing their oil and natural gas from foreign markets, the Soviets could become the only industrialized nation with the resources to be an energy autarky.

The Soviets will probably not decide on either course. A deliberate choice to follow either path would, as the two geographers who authored this thorough survey conclude, require a boldness atypical of the aging Soviet leadership. As in so many areas of political and economic life in the U.S.S.R., the Brezhnev generation will continue to address the energy problem through ad hoc measures, sidestepping underlying controversies over the basic direction of development.

What is the Soviet "energy problem"? Quite different from that of the rest of the developed world, Dienes and Shabad point out. The Soviets suffer no shortage of raw energy resources—oil, gas, uranium, coal, or hydroelectric sites. To take a single, striking example, Soviet coal supplies are estimated at 6790 billion metric tons, dwarfing the second-largest reserves of the United States, placed at 437 billion tons. The problem the Soviets face is, rather, how to exploit this embarrassment of energy riches in ways that maximize benefit for the Soviet economy and support Soviet foreign policy goals.

From one sector to another detailed by the authors, organizational, managerial, and technological inadequacies compound the difficulties presented by the natural distribution of Soviet energy resources. Three-quarters of the energy consumed in the U.S.S.R. is still used by heavy industry in European Russia. Yet the long-developed coal mines, oil wells, and natural gas fields of western Russia will satisfy only 60 percent of the region's energy needs by 1980 and only 40 percent by 1990. Energy to make up the shortfall, as well as most growth in production needed to meet Soviet targets, must come from new hydroelectric projects and massive gas, coal, and oil development in Central Asia and Siberia.

The necessity of starting from ground zero in these remote areas, exploring to locate deposits, building the refineries to process the resources once they are mined, and laying the railroads and pipelines to move the supplies to areas where they are needed has made progress painfully show. Projects like a gas liquification scheme at the Urengoy Siberian field have been additionally handicapped. Having anticipated Western technical help, Urengoy was thrown back on less efficient Soviet methods when the U.S. Congress limited trade credits to the U.S.S.R. in 1974. Crash exploitation techniques, encouraged by demands of central planners that production be dramatically boosted, have reduced the overall output from oil fields.

These shortcomings have caused a drop in the growth of energy production in the Soviet Union. How sharp the decline will prove is a matter of debate among Western analysts. The authors of this book stop short of predicting the actual fall in production, beyond the failing growth rate, forecast by the U.S. Central Intelligence Agency. Since increasing productivity of labor and economic growth rates seem to have followed increased energy consumption in the U.S.S.R. as in most economies, Soviet planners have cause to worry about the downward trend.

The Soviets have some interesting advantages over Western nations in executing strategies to cope with energy problems. No public outcry impedes rapid development of nuclear power as an alternative source. Plants may be converted on command from one fuel to another to promote substitution. Conservation can be ordered rather than recommended. Supplies to industry may simply be cut—as they were by 7 percent in 1977. Plants may be moved closer to energy sources. Administrative control over energy is highly centralized.

Yet the constraints of Soviet geography remain and for the foreseeable future will leave the U.S.S.R. on the horns of a dilemma. The Soviets are slated to provide 86 percent of Eastern Europe's oil imports and all of the region's gas imports through 1980, and at least 60 percent through the decade of the '80's. Any shift in this pattern would likely pose the threat of instability in the Soviet Bloc countries. Perhaps even more important, oil, and now gas, are the major Soviet hard-currency earners in trade with the West. The strain between the need for oil and gas in the domestic economy and the political and economic benefits reaped from export to Eastern Europe and beyond may present some unpleasant choices to Soviet decision-makers.

Viewing the Soviet energy sector as a whole, one is struck by the quality of unevenness of development that is characteristic of the entire economy. Ninety-nine percent of Soviet farms are electrified. One wonders whether the figure would be correspondingly high even in the United States. Yet the U.S.S.R. is in the company only of Ireland among relatively advanced nations in still using peat to satisfy a portion of fuel needs. One is also struck by the sheer magnitude of Soviet plans and accomplishments. Laying thousands upon thousands of miles of oil and gas pipelines, creating a unified power grid spanning the vast Eurasian continent, and developing the technology to tame arctic conditions are projects that would tax the capacities of the most efficiently organized economy.

If Dienes and Shabad's book has a single flaw, it is one common to the fields of physical and economic geography. What might be called a "geographer's perspective" tends to pay only scant attention to the human, social, and political factors that condition patterns of development. The authors mention that the Soviets have adopted the "expedition method," used by U.S. companies to develop the Alaskan oil fields, in the Siberian energy projects. Instead of establishing permanent settlements near the energy sites, the Soviets transport workers in shifts to the remote locales, allowing them periodic home leave. Yet no hint of the drunkenness and despondency, hence low productivity among the laborers, that caused the Soviets to abandon their earlier strategy of creating new towns in the Far North is to be found in the book.

The Soviet energy picture provides an excellent context for considering the constraints that will condition Soviet foreign policy, defense, and role in the world economy in the future. The authors think that Western hesitancy to become involved in Soviet energy develop-

ment and Soviet need to curtail hard-currency energy sales will force the Soviets to retrench, moving toward energy autarky.

True, the political atmosphere that shapes the willingness of Western countries to permit their companies to become involved in facilitating Soviet energy projects is worsening. Yet two opposing tendencies militate against a Soviet drift toward autarky. First, the interest of the United States in keeping the Soviet Union on the world market as a supplier of oil and gas and off the world market as a consumer of those commodities may outweigh the political impulse to let the Soviet energy economy stew in its own juice. Precisely this consideration led President Carter to free over 50 energy-related export licenses from embargo by the U.S. government in January 1979.

Second, soon after the coming change in top leadership in the U.S.S.R., an entire generational turnover will cascade through the levels of the Soviet economy. If one quality is clearly visible among the new elite, it is dissatisfaction with the Brezhnev tendency to widen the gap between official rhetoric and practical solutions to problems. A sharpening of the alternative paths for the Soviet economy, of which energy is perhaps the most essential segment, is liable to occur in the jockeying for position accompanying the leadership change. Which tendency will prevail is impossible to predict, but all of the participants in the debate will have operated during most of their careers during an era of growing Soviet interdependence with Western economies that has been largely beneficial for Soviet development.

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Regarding Technology

The History and Philosophy of Technology. GEORGE BUGLIARELLO and DEAN B. DONER, Eds. University of Illinois Press, Urbana, 1979. xxxii, 384 pp. $17.50.

The 24 papers in this collection come from a wide variety of disciplinary backgrounds and interests and collectively reveal a rich array of unexplored avenues in the history and philosophy of technology. Papers by N. Rosenberg, L. Mitcham, D. Wojick, M. Bunge, H. Burstyn, and H. Skolimowski are especially thought-provoking. In the following paragraphs I will try to address some of the central themes in the book, without dwelling on individual essays.

There seems to be general agreement among the contributors that technology is part of culture and that it should not be identified with applied science. On the latter score a distinction is drawn by D. S. Cardwell between "empirical" and "science-based" invention (p. 5). When it comes to applying this distinction in particular cases, however, it can be difficult to maintain, for it is not easy to say when plain empiricism leaves off and science begins, and some technological devices—for example the compass and Watt's heat engine—can be seen as examples of applied science.

Granted that technology is a part of culture, opinions differ as to whether it is "an adaptive strategy, a strategy not only for survival but also for growth and elaboration" (p. 135). Some authors think that at its current state of development technology is largely a cultural aberration practically in the same class as poverty or crime. Many objections are leveled against it. For example, it is claimed that technology is based mainly on "quantitative instrumental values" (p. 332), involves a limited notion of rationality (p. 329) and a limited metaphysics (p. 330), values only material goods and survival (pp. 301-305), destroys the value of human beings (p. 368), destroys humans' views of themselves (pp. 288, 295, 301), creates practically unmanageable interaction among people and other systems (pp. 91-95, 105), follows a technological imperative that seeks "standardization, systematization, concentration, homogenization, perhaps ultimately sterilization" (p. 306), generates a practically unmanageable rate of change (pp. 344-345), and provides the possibility of profound changes far out of proportion to any efforts required to produce the changes (p. 236).

Only a fool would deny some of these charges, at least some versions of some of them. But some of them are pretty plainly false, some are based on different views of what constitutes a good life for individuals and the human race generally, and some are based on different views about key concepts and their definitions. For example, Skolimowski is worried about the consequences of thinking about efficient means to ends that are hardly thought about at all. He is also worried, as are Wojick and Rosenberg, about what Daniel Yankelovich called "McNamara's fallacy," that of ignoring whatever cannot be quantified or measured. We ought to worry about such errors and actively resist them, but one should distinguish these pursuits from objections to technology. The errors are liable to be committed in the course of virtually any activity, whether related to technology or not. A more efficient strategy for preventing such errors would be to object not to technology but to the errors themselves. I used the word "efficient" on purpose because it is a familiar word and in the present context is a very efficient means to making more than one point. In a world of scarce resources, efficiency is laudable.

When people talk about instrumental values, they usually contrast them with intrinsic values. There are many reasons why some thinkers want to postulate these two kinds of values, but none of them are very good reasons. Usually it seems to be held that if there are no intrinsic values then finally nothing is really valuable because at best everything is only instrumentally valuable for getting something else. Those who take this view may be found also holding the view that there must be some unshakable basic truths about the world on which all knowledge finally rests, or else nothing can be known to be true. Such folks are haunted by the specter of infinite regresses, circular reasoning, and arbitrary decisions. However, many years ago Hans Reichenbach suggested that one might think of revisions in systems of knowledge as similar to repairing a ship at sea. One fixes this or that without tearing down the whole structure and sinking it in the process. Just as there need be no single plank on which the integrity of the whole ship rests, there need be no single truth or evaluation, screened from critical examination, on which one's values or knowledge rests. So whether one opts for a single sort of value or rationality is irrelevant to whether one makes errors of pursuing ends without thinking about them or neglects important things like love and friendship because they can't be measured.

Consider also the claim that technology destroys our view of humanity, say, by molding people in accordance with a technological imperative. First, it is not obvious that there has ever been a human being without any technology. Second, people do express themselves through some technology; remember musicians, painters, and sculptors as well as all the little things one fabricates to personalize one's world. Third, some people see the good life not as meshing with nature, with whatever consequences that has (some species have meshed right out of existence doing what comes naturally), but as managing nature (including our own baser natures) in the interests of humanly chosen goals. Of