Views of Exchanges

Science Between the Superpowers. YAKOV M. RABKIN. Priority Press, New York, 1988 (distributor, Unwin Hyman, Winchester, MA). viii, 119 pp. Paper, $8.95.

Techno-Diplomacy. US-Soviet Confrontations in Science and Technology. GLENN E. SCHWEITZER. Plenum, New York, 1989. xiv, 320 pp. $22.95.

With the Soviet Union now opened to the West as never before, joint economic ventures and scientific research efforts are growing in quantity and quality. Scientific exchanges, so often limited by the vagaries of the political winds blowing in Washington and Moscow, will assume increasing importance in the 1990s. Similarly, as Western firms search for new markets in the Soviet Union, and as that nation and the United States work to achieve arms reductions, the issues of technology transfer and national security call for reevaluation. Yakov Rabkin's *Science Between the Superpowers* and Glenn Schweitzer's *Technodiplomacy* will assist in this process.

The basic premise of *Science Between the Superpowers*, which Rabkin, a historian of science at the University of Montreal, wrote for the Twentieth Century Fund, is that exchange programs with the Soviet Union are valid only for scientific purposes and that they have been to the advantage of the Soviets. This lucid study is based on substantial research in primary sources, but it is dated by a Cold War mentality revealed in a seldom-hidden disdain for Soviet motives with regard to the exchanges and for American unwillingness to deal with the Soviet Union in a more adversarial fashion on issues of human rights and technology transfer. The first chapters offer a brief political history of the development and mechanics of the exchanges in such organizations as the International Research Exchanges Board (IREX) and the Office of Soviet and East European Affairs of the National Academy of Sciences. Rabkov then turns to issues of costs and benefits, risks to national security, and human rights raised by these programs.

Rabkin argues that the Soviet Union pursues exchanges for three reasons established by the *nomenklatura*, its ruling elite: to acquire Western science and technology on the cheap and to engage in espionage; to control contacts between Soviet and foreign scientists; and to coordinate surveillance over visiting foreigners. Though Rabkin is rightly critical of the Soviet practice of sending bureaucrats rather than scientists to the West for conferences and research, he assumes that the Soviet exchange must represent the interests of the *nomenklatura* rather than the Soviet scientific community or a larger "international ethos of science," a term he never pauses to explain. As a result, he pays little attention to the cultural and political context of modern science. It may be that the interests of scientists and bureaucrats overlap. Many Soviet exchangees have been first-rate scientists. And, as Rabkin admits, it would be difficult by any standard to determine who is "official" and who represents the interests of the international ethos. These norms, he argues, were not part of bilateral exchanges negotiated during the 1970s.

Rabkin is critical of the exchanges for failing to serve the interests of the United States. He notes that the goals of exchanges in the United States are to bring about greater Soviet dependence on the West, to provide access to a liberal Soviet elite, and to monitor Soviet science. The exchanges have accomplished this, and there is, in my view, nothing unreasonable in these goals. Rabkin, however, believes that the exchanges should have tangible scientific benefits in light of "the international scientific norms of free interpersonal communication and collaboration"; opening the Soviet Union up to scrutiny is not enough.

The presence of three groups of actors—the scholars themselves, the exchange organizations, and such organs of the federal government as the Departments of Defense, State, and Commerce—makes it difficult to generalize about the policy of the United States. But Rabkin has identified two fundamental positions: There are those who favor the exchanges, usually the scholars, exchange organizations, and the State Department, and those who see real danger to national security in giving the Soviets free access to Western technology while gaining nothing in return. In the main, Rabkin attacks the former, suggesting that the United States is the loser in sending humanists, linguists, and historians to the Soviet Union in return for Soviet engineers and technical specialists.

Among Rabkin's policy recommendations is that scientific exchanges be conducted in conformity with the "international ethos," that is, on the basis of the interests of individual scientists rather than official agreements between governments or academies. Placing science in the hands of scientists, he asserts, would avoid government-imposed bans that have unnecessarily politicized American science. This assumes that American scholars are apolitical, or at least do not recognize their scientific activity as reflecting culture and politics of the United States, in the same way the attitudes of Soviet scholars may reflect the dominant values of their system, and that American scholars desire to go to the Soviet Union only for scientific purposes. Rabkin suggests that the role of the U.S. government should be limited to visa approval based on recommendations of the intelligence community and monitoring of exchanges by scientometric analysis. Yet as he himself points out, in the United States scientists usually function as independent scholars at universities. As such they are at a disadvantage in dealing with a massive Soviet bureaucracy, and to my mind some bureaucratic entity is needed to facilitate the exchanges.

Since Rabkin assumes that the primary benefit of exchanges should be scientific, he opposes earmarking funds according to country. Exchanges should be based on scientific trends—and scientometric analysis of the most promising fields. Were the only goal of exchanges scientific, I might agree with him. For the purposes of net assessment of R&D capabilities and influence of Soviet leaders, however, broadened support is imperative. Also, exchanges have provided an avenue to monitor human rights, as both Rabkin and Schweitzer point out. Nor should we consider it unreasonable that the Soviets especially desire cooperation in fields in which they are backward or that are important to economic development.

Finally, there are several issues concerning technology transfer and national security whose answers are more complex than Rabkin indicates. First, he suggests it is possible to distinguish between science and technology, so as to permit access to the former and deny it to the latter. One example, plasma physics, an important theoretical component of tokamak fusion research, shows how difficult this would be. This is an area where the Soviets have a record of accomplishment and interest in sharing costs with the United States. Yet research in this field could lead to improvements in strategic weapons. Second, Rabkin proposes controlling Soviet access to American facilities when technology or a defense agency contract is involved. Given the increase in the share of fundamental research supported by the military budget, much fundamental research would be off limits to Soviet-American exchanges by this standard. Third, scientific exchanges with the Soviet Union have enabled the United States to examine at first hand the backward state of Soviet technology and gauge the bankruptcy of the Soviet approach to technology transfer through "reverse engineering" or theft. To the extent possible, the government ought to impede the flow of strategic technologies to the Soviet Union. But what of the efforts of the Reagan Administration to restrict flows of information through the FBI's library awareness program or by prior censorship of information

at conferences supported by defense department funding? Most American specialists in sunrise industries agree that speed of information dissemination gives American science its vitality. To what extent are these programs and restrictions part of the "international ethos of science"?

Glenn Schweitzer, whose career in various government agencies gives him special insights into the politics of the exchanges, wrote *Technodiplomacy* with a broader audience than Rabkin's in mind. Schweitzer covers many of the same issues as Rabkin, but goes beyond exchanges to consider other aspects of scientific-technological cooperation and competition. Since he covers such diverse topics as military R&D, computers, and the educational system, he ought to have drawn more heavily on other literature. The anecdotal aspects of this book drawn from his own experiences are the most interesting.

In contrast to Rabkin, Schweitzer sees more good than harm in the past exchanges. He recommends less political interference in the running of the programs, noting that "enlightened leaders" in Congress and the Executive Branch have tried to convince the public that national security extends beyond the size and capabilities of military forces. He is also skeptical of government attempts to restrict the flow of certain kinds of information in the United States. He recognizes the important political symbolism of scientific cooperation for the United States and the importance of the exchanges for Gorbachev, whose policies involve outreach to the West for technologies to assist economic perestroika through joint ventures, licensing, and scientific exchanges. He notes that Soviet technology acquisition is an effort to compensate for the isolation of Soviet specialists, and he discusses the difficulties created by bureaucratic encounters. His study is also timely for drawing attention to some of the first reforms attempted in the administration of the Soviet R&D apparatus.

There are two problems with *Technodiplomacy*. First, the subtitle, "US-Soviet Confrontations in Science and Technology," is somewhat misleading. The book covers a number of topics only tangentially connected to that subject and provides a rather standard treatment of them. More systematic analysis of U.S. interests and competition among interested parties would have helped. Second, though the writing is generally accessible it is diffuse and ill organized, with a multitude of topics touched on in each chapter.

Both books could have benefited by recognition of the fact that the extent to which the Soviet Union ought to be more autarkic in the development of its science and technology or a part of the international scientific community has been an issue of debate by leading scientists and policymakers throughout Soviet history. And both authors fail to note the real problem facing Soviet science and technology, extreme poverty. It is to overcome this problem that Gorbachev supporters in the R&D apparatus have pushed Soviet policy irreversibly in the direction of opening the Soviet Union to the West.

Both *Technodiplomacy* and *Science Between the Superpowers* point to the areas having the greatest potential for future cooperation: such global problems as the environment, medicine, and "big" or expensive science and technology. They also call for cooperation on arms control, human rights, and regional issues. Though the rapid changes that have occurred under Gorbachev have dated certain aspects of their work, the authors raise issues that will have to be taken into account in evaluating the promise and problems of cooperation with the Soviets in science and technology.

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Some Other Books of Interest

Red Panda Biology. A. R. GLATSTON, Ed. SPB Academic Publishing, The Hague, 1989. xvi, 187 pp., illus. Paper, $34. From a conference, Rotterdam, the Netherlands, Aug. 1987.

"With its chestnut and chocolate coloured pelage, its tear-streaked face and its waddling gait," the red or lesser panda, *Ailurus fulgens*, "is one of the most attractive and appealing mammal species," according to Glatston in the preface to this volume. Yet it has been the subject of relatively little scientific study, most of which has been based on captive specimens. This book brings together some of that research. The book opens with an account of the Nepal-Himalayas Red Panda Project, an ecological study funded by the World Wildlife Fund, and a history of the red panda in captivity. Of the subsequent papers, one deals with diseases; four with diet, one motivation for such studies being that the panda's natural dietary staple, bamboo, is in uncertain supply; and two with energetics, especially regarding thermoregulation and lactation. Research and management practice in various European and North American zoos are reported on in another five papers, and the three final papers consider the demographic development of the captive population since a studbook was established in 1978 and issues of genetic variance. The book begins and ends on a conservation theme. Both the panda's taxonomic position and its status in the wild are uncertain, but given that, with its possible relative the giant panda, it represents a unique carnivore adaptation, its loss would be "a disaster."—**K.L.**

Physiology of Cold Adaptation in Birds. CLAUS BECH and RANDI EIDSMO REINERTSEN, Eds. Plenum, New York, 1989. x, 384 pp., illus. $89.50. NATO Advanced Science Institutes Series A, vol. 173. From a workshop, Loen, Norway, June 1988.

In their preface the editors note that recent conferences on vertebrate thermoregulation have generally emphasized mammals and that "this book seems to be the first one ever published which solely deals with thermoregulation in birds," the mechanisms of which "are often different from those used by mammals." The papers in the volume are arranged under seven headings: Central Mechanisms of Thermoregulation (three papers), Mechanisms of Heat Production (five papers), Metabolic Adaptations (seven papers), Respiration and Circulation (nine papers), Physiology of Hypometabolism (six papers), Breeding and Incubation (four papers), and Adaptations to Cold in Chicks (five papers). Each group opens with a general consideration of its theme, the respective authors being E. Simon, E. Connolly *et al.*, W. R. Dawson and R. L. Marsh, J. Piiper and P. Scheid, H. C. Heller, J.-P. Robin *et al.*, and R. E. Ricklefs. The remaining papers are reports of laboratory studies on various species ranging from bantams and pigeons to Arctic terns. A subject index is included.—**K.L.**

Books Received

Acute Lymphoblastic Leukemia. Robert Peter Gale and Dieter Hoelzer, Eds. Liss (Wiley), New York, 1989. xx, 339 pp. illus. $69.50. UCLA Symposia on Molecular and Cellular Biology, vol. 108. From a workshop, Tapatio Springs, TX, Nov.-Dec. 1988.

Biochemistry. Dawn B. Marks. Williams and Wilkins, Baltimore, 1990. x, 343 pp., illus. Paper, $18.95. Board Review Series.

Chromatographic Analysis of Pharmaceuticals. John A. Adamovics, Ed. Dekker, New York, 1990. xii, 661 pp. $125. Chromatographic Science, vol. 49.

Downstream Processing and Bioseparation. Recovery and Purification of Biological Products. Jean-François P. Hamel, Jean B. Hunter, and Subhas K. Sikdar, Eds. American Chemical Society, Washington, DC, 1990. viii, 312 pp., illus. $69.95. ACS Symposium Series, vol. 419. From a symposium, Toronto, Ontario, June 1988.

Ecological Experiments. Purpose, Design, and Execution. Nelson G. Hairston, Sr. Cambridge University Press, New York, 1989. xiv, 370 pp., illus. $52.50; paper, $24.95. Cambridge Studies in Ecology.

The German Continental Deep Drill Program (KTB). Site-Selection Studies in the Oberpfalz and Schwarzwald. R. Emmermann and J. Wohlenberg, Eds. Springer-Verlag, New York, 1989. x, 553 pp., illus. $79.50.