Book Reviews

Intellectual Motivations in the U.S.S.R.

Science and Philosophy in the Soviet Union. LOREN R. GRAHAM. Knopf, New York, 1972. xii, 584 pp. + index. $15.

This work provides a detailed examination of the way certain serious thinkers in the Soviet Union—both scientists and philosophers of science—have dealt with some of the philosophical questions raised by 20th-century science. What differentiates Graham's work from most previous writing on similar subjects is that he has sought out the writings of those who have grappled seriously with substantive issues of philosophy, rather than basing his discussion on party pronouncements or on what one Soviet physicist to whom he showed his work described as "offensive parodies of intellectual investigations," all too common in Soviet writings on these subjects.

The philosophical viewpoints of all those whose views Graham examines can of course be subsumed under the heading of dialectical materialism, the official scientific philosophy of the Soviet Union. One of Graham's major aims is to show that within the framework of this official philosophy considerable flexibility and intellectual creativity are possible and that many Soviet thinkers have displayed such qualities in a way which deserves more attention than it has generally received in the West.

In considering the whole spectrum of science in its interaction with philosophy, Graham finds that the case of such interaction which is best known outside the Soviet Union, that of Lysenko in genetics, is perhaps least typical of the general situation in the Soviet Union. Following the interpretation of David Joravsky and the recently published works of the Soviet biologist Zhores Medvedev, Graham makes clear that the Lysenko affair had little to do with Marxism or dialectical materialism on the philosophical level, but was rather a unique case due chiefly to the central importance of agricultural productivity in the Soviet economy during the drive for forced industrialization. Tragic as it was, it must be understood not as philosophy being improperly used to control science but rather as a purely political power struggle involving a central figure who, far from being a representative of any coherent scientific philosophy, had only dubious claims to the title of scientist at all. Of course, the overt political support given to Lysenko was of importance to other areas of science, but chiefly in providing a warning of what could happen at worst. It thus provided an important stimulus for scientists in other fields to express themselves on questions of dialectical materialism as a way of mobilizing their philosophical resources to provide defenses against the kind of crude interference represented by the Lysenko affair.

Graham acknowledges this kind of motivation for some of the philosophical discussions which he portrays, and he gives a well-informed, succinct, and clear account of the fluctuations in the political situation from the early days of the Soviet period through the late 1960's and their influence on philosophical discussion. But he argues that despite the obvious political motivation of much of such discussion, the best of it arose also out of sincere belief and genuine intellectual interest, above and beyond the bounds of political necessity. As proof he cites the fact that certain scientists expressed certain views both before and after the periods of greatest political pressure, and at a time when many of their colleagues were able to avoid doing so, at least to such a degree; he argues that in some cases the fact that only a small minority in a field, and these of high repute, engaged in the kind of discussions he reports is proof that they acted from other than political motives. There will undoubtedly be those who find his reasoning on this matter not completely convincing or his conclusions too charitable.

But the chief contribution of this book lies in its field-by-field examination of the particular interactions of philosophical viewpoints and scientific issues. In physics, Graham finds that the implications of quantum mechanics and the uncertainty principle for concepts of causality and determinism troubled Soviet scientists as they troubled scientists and philosophers of science elsewhere. Graham makes clear that these philosophical problems did not interfere with the acceptance of the scientific theories themselves in the Soviet Union during the 1920's and 1930's, and that even during the period of greatest political pressure, the late 1940's and 1950's, at least one eminent physicist, V. A. Fock, was able to maintain a view contrary to the official one. Developments since that time have, Graham believes, provided Soviet thinkers with modifications of determinism sufficiently flexible to handle whatever further philosophical questions quantum mechanics may raise in the future. Similarly Graham finds that Soviet criticisms of Einstein's theory of general relativity are able to "command respect and attention abroad" and that the "dimensions of debate" on this matter in the Soviet Union are "fully sufficient" for consideration of the major range of views of non-Soviet scientists on it.

Graham examines the specific dynamics of controversies in a number of other fields, including cosmology and cosmogony, structural chemistry, cybernetics, physiology, and psychology. Although the specifics of course vary, he generally finds that despite distinct bias in interpretation of certain scientific issues because of the influence of dialectical materialism in its various forms, the range of philosophical interpretation is usually sufficient to soothe the conscience of the philosophers and allow the scientists to get on with their work unimpeded. One might feel more comfortable with Graham's carefully detailed descriptive presentation of all this if he did not so frequently seem to assume, without exploring the matter further, that because Soviet thinkers often disagree on issues which also provoke argument outside the Soviet Union the arguments are somehow equivalent or on the same level.

As to the central question of how these philosophical tendencies and pressures have actually helped to shape the patterns of scientific activity in the Soviet Union, this book provides answers which are far from clear-cut. Graham's own explicitly stated view, which he admits to be unprovable, is that dialectical materialism as a deeply held philosophical view has been for many Soviet scientists a positive stimulus for much of their best work.

At the least, Graham has clearly shown that there is no simple or one-to-one relationship between the tenets of dialectical materialism and what may be investigated or accepted in any given scientific field, if only because of the ingenuity and adaptability of those who do the defining as to what is philosophically acceptable. Paradoxically, Graham's own efforts to take seriously the philosophical dimensions of these various issues seem to lead to the conclusion that the real determining influences must be sought elsewhere—in the logic of science itself, in economics, or in the power struggles of individuals and institutions. This is a problem, however, which Graham does not confront directly in this book.

Graham presents complex issues of both science and philosophy with an admirable lucidity, which makes them accessible to readers with little background in the specifics of science, philosophy, or the Soviet context. Graham's solid grounding in the general history of science also provides a perspective that is often lacking in treatments of this sort of question in Soviet studies. In short, this is an important book, one which opens up new ground and should set a new standard of serious discussion in the areas with which it deals.

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The Population Biology of Man

The Structure of Human Populations. G. A. HARRISON and A. J. BOYCE, Eds. Oxford University Press, New York, 1972. xvi, 448 pp., illus. Cloth, $24; paper, $10.25.

Population can mean one thing to a social scientist and another thing to a biologist. This volume, which arose from a Wenner-Gren Foundation conference at Burg Wartenstein, brings together representatives of genetics, demography, ecology, psychology, anthropology, and sociology in an attempt to break down barriers of thought and build an integrated approach to this complex topic. And, insofar as 20 separate contributions permit, it succeeds. Appropriately, the authors include 12 Americans, 7 Englishmen, 1 Australian, and 1 Brazilian. Populations analyzed range from the Andes and the Arctic to the tropics of Africa and Asia.

The first half of the book deals more with general principles than with particular peoples. In relating the role of geographical influences in the distribution and growth of human populations, Clarke stresses the increasing importance of cultural relative to physical factors. DeJong introduces us to raw data on births and deaths and estimated fertility ratios for countries of the world in differing stages of the so-called demographic transition; his somewhat surprising conclusion is that the main determinant of aging in a population is the fertility rate. The sources, methods, and substance of the historical demographer, especially exemplified by his own studies in Norway, are treated by Drake, who maintains that the demographic experience of the preindustrial West, though far from homogeneous, is strikingly different from that of non-Western societies in that in the former households are smaller and there are tighter controls on fertility and nuptiality.

"Social regulation of fertility," by Benedict, appeals to me by virtue of its clear interrelation of cultural and biological parameters. Thus, age at marriage, polygamy, celibacy, and other patterns of social structure are considered alongside contraception, abortion, and infanticide. Benedict cites the unfortunate experience of Mauritius, where disregard of the culture led to the demise of a well-intentioned birth control program. Provocative is his statement "Except under the harshest ecological and economic conditions, human beings do not regulate their populations in relation to the food supply, but in relation to the prestige supply."

The profound effect of differential sex ratios is explored by Teitelbaum. Although a long list of factors associated with the proportion of male to female births have been suggested, Teitelbaum believes that only birth order, race, and socioeconomic status are significant. This still leaves open the question of how these factors operate. In a review of mathematical models, Hiorns suggests that formal theory plus computers will keep pace with investigations of models of demographic phenomena. The two editors of the volume relate migration to the genetic structure of populations, citing the recent theoretical work of Cavalli-Sforza and Malécot and their own studies of marriage distance (that is, the distance between the birthplaces of spouses) in Oxfordshire.

At least two papers draw on the findings of Schull and Neel on inbreeding in Japan. Schull first traces the history of the genetic effects of mating systems and then cites the small but pervasive influence of inbreeding on several physical and mental attributes in the Japanese data. Spuhler expands this theme and finds, on the basis of a wide variety of studies, significant positive assortative mating for intelligence.

The relationship of intelligence and social mobility in societies with classes or castes, explored by Halsey, makes interesting reading. In a model with simplifying assumptions of some hereditary component of intelligence, higher intellect in an upper social class that constitutes 10 percent of a population, and both upward and downward mobility between the classes, he suggests that low intelligence could be bred out of the high class but that high intelligence would never be bred out of the low class. Surprisingly, draining off of high intelligence scarcely affects the innate intelligence of the larger lower class. The assumption of a single gene for intelligence, however, weakens the conclusions. Halsey indicts the British educational system (could the American be included, too?) as "extremely inefficient . . . in turning natural ability into educational achievement."

Dobzhansky examines the question of continuing natural selection in mankind and concludes on grounds admittedly more theoretical than concrete that biological evolution has not ceased just because cultural evolution has become effective.

Subsequent chapters deal with particular populations. Thus, Salzano summarizes age and sex distribution, admixture, inbreeding, fertility, and mortality among American Indians.

One of the most thorough and interesting papers is Chagnon's explanation of social organization and its genetic consequences among the Yąnomamö. These 10 to 15 thousand Indians occupying 125 scattered villages in southern Venezuela and northern Brazil practice a bilateral cross-cousin marriage, polygyny, village fissioning, and what must surely be the most intense and continuous warfare of any people on earth; about one-third of all adult males suffer violent death. The fissioning and migration which create new villages depend upon complex kinship lines as well as upon population size. This, plus the advantages which a headman enjoys in his choice of multiple mates, leads to genetic microdifferentiation, which is well documented by findings on comparative gene frequencies.