Science and Its Context

Natural Order. Historical Studies of Scientific Culture. BARRY BARNES and STEVEN SHAPIN, Eds. Sage Publications, Beverly Hills, Calif., 1979. 256 pp. Cloth, $17.50; paper, $8.95. Sage Focus Editions.

The ten original essays in this volume were brought together not because they treat some single aspect of science—although seven have to do with biology since the mid-18th century—but because their authors, most of whom are or have been associated with the Science Studies Unit at the University of Edinburgh, share an attitude toward the historical study of science. It is what the editors call a "relaxed" or "naturalistic" attitude toward science, a refusal to assume a priori that science has some special status relative to other forms of knowledge and an inclination to treat science simply as another part of our culture, one that is sociologically equivalent to technique, art, music, or literature. As no one assumes that these other subcultures are independent of the environment in which they exist, no such independence should be assumed in the case of science either. None of the contributions to the volume denies that science may be in some respects unique, but throughout it is urged that abandoning the assumption of uniqueness opens avenues to understanding science that would otherwise remain closed. One of the editors has written elsewhere, "We will doubtless continue to evaluate beliefs differentially ourselves, but such evaluations must be recognized as having no relevance to the task of sociological explanation; as a methodological principle, we must not allow our evaluation of beliefs to determine what form of sociological account we put forward to explain them" (Barnes, *Interests and the Growth of Knowledge*, Routledge and Kegan Paul, 1977).

During the last several years, as the editors acknowledge, this "relaxed" attitude has become commonplace among historians of science, and its salutary effects are apparent not only in sociological treatments of science but in more traditional studies as well. For instance, John Greene (*J. Hist. Biol.* **10,** No. 1, 1 [1977]), who approaches Darwin from the standpoint of intellectual history, has reached substantially the same conclusions as Shapin and Barnes in their essay in this volume on the historiography of Darwin and social Darwinism: Darwin's thought cannot be understood apart from the culture in which it was embedded. Even in the most narrowly focused "internal" study one is much less likely now than 20 years ago to find references to the "discovery" of some scientific idea or to the "right" and "wrong" positions in a scientific controversy. *Natural Order*, however, is designed to illustrate one particular consequence of this new attitude: if science is simply one among many subcultures, the methods and theories of the social sciences that are routinely applied in the study of other subcultures may be applied to the study of science as well. Contributions to the volume were solicited that were explicitly concerned with "natural knowledge as culture" and with using anthropological and sociological methods of understanding it. The authors have drawn on the anthropology of Durkheim and Mary Douglas and the sociology of knowledge of Marx, Mannheim, Jurgen Habermas, Lucien Goldmann, and others.

The diversity of methods, as well as of subject matter and style of argument, precludes selecting a typical essay for discussion. But Christopher Lawrence's "The nervous system and society in the Scottish Enlightenment" does at least suggest clearly the kind of light that sociological and anthropological approaches may throw on science's past. Lawrence argues that although an interest in the integration of body function and in the sensibility of the organism and a preoccupation with the role of the nervous system were common in the mid-18th century, they were combined and stressed in a unique way by Robert Whytt, William Cullen, and the other leading figures of Edinburgh medicine; and that this unique feature of Scottish medical theory can only be explained by reference to the social and economic transformation of Scotland in the years after union with England (1707) and especially to the "social interests and self-perceptions" of the Edinburgh elite. Lawrence finds formal similarities between conceptions of the body and conceptions of the social order in Edinburgh: the body was supposed to be integrated and held together by the sympathy of the parts, mediated through the nervous system; and society likewise was held to depend on sympathy. The Edinburgh physicians did not directly take society as their model for the body. Both the conception of society and the conception of the body reflect the interested self-perceptions of the lowland elite in Edinburgh at a time when they were seeking to extend, and to justify extending, their dominance over various "backward" elements, such as the highlands. The Edinburgh conception served the elite's social and political interests, but Lawrence insists that it also served the technical interests of physicians and that it was a brilliant interpretation of physiological evidence.

Most of the essays are slightly less anthropological than Lawrence's. Thus Joan Richards suggests that the reception and development of non-Euclidean geometries in England in the late 19th century was determined largely by the role of geometry in English philosophers' arguments about man's ability to acquire knowledge of the truth behind appearances. Jonathan Harwood, in an essay on the most recent race-IQ controversy in the United States, explains it primarily by reference to shifts in government and corporate social policy. And Barnes and Donald MacKenzie argue that the biometry-Mendelism debate early in this century was sustained by the social interests of Karl Pearson and William Bateson. None of the essays is as persuasive as it might have been had the editors (and publisher?) not imposed stringent limits on space, and therefore on the amount of evidence and argument that each author could employ. But all of them are thoughtfully constructed and provocative, with the result that the volume as a whole does an effective job of indicating the utility and interest of the insights anthropological and sociological viewpoints on science can provide.

One apparent self-deception of the editors requires notice. Barnes and Shapin claim that a "naturalistic" attitude toward science leads to a "properly disinterested" way of doing history, that it does not close any evaluative or political options, but that it excludes all of them from historical practice. One might argue against them, after the fashion of Roger Cooter in an essay in this collection, that if they employ, for instance, a functionalist approach in their sociology of science they are conveying an ideology;

that which appears neutral merely carries its ideological burden in a mediated and mystified form. Or instead one might argue against them from the perspective of this whole volume that social interests shape the generation of all knowledge, including the sociologist's knowledge of the history of science.

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Socioeconomic Differentiators

The Inequality of Pay. HENRY PHELPS BROWN. University of California Press, Berkeley, 1978. xvi, 360 pp., illus. $16.50.

The Inequality of Pay, which surveys a wide range of secondary materials on occupations, social stratification, and the structure of earnings in modern societies, is recommended reading for anyone interested in those subjects. The volume is not remarkable for the problem it addresses, to "show how far inequality of pay is imposed by market forces and how far by custom and convention, by status, class, and power" (p. 25), or for the conclusion reached some 300 pages later, that "the main cause of the inequality of pay is the inequality of abilities to work" (p. 332). But, though one may choose to quarrel with the conclusions drawn from it, most readers will learn a considerable amount about historical, comparative, and cross-sectional differences in rates of pay from the evidence presented.

Entire volumes have been written about the subjects to which Brown's main substantive chapters are devoted—occupational differences in pay, changes in occupational pay structure, the relationship between pay and status, discrimination, intergenerational mobility, social class and mental ability, intraoccupational differences in earnings, and income distribution. Brown adds no new knowledge on these subjects save that which is derivative from the way he juxtaposes the results of previous inquiries. His main contribution is simply that of putting between two covers a substantial amount of what is known about these matters.

As in almost any survey as comprehensive as that undertaken by Brown, significant items are missed. This reviewer found himself enlightened about subjects that have attracted little of his own research interests and disappointed in the treatment of topics closest to his own areas of expertise. Some examples may suffice to indicate the ways in which this volume suffers from tackling a task that is perhaps too large for any one essayist, given the present stage of development in the social sciences.

There are four logically possible ways in which pay and status—the latter referring to a person's effective claim to social esteem in terms of positive or negative privileges (p. 111)—can be related: (i) pay determines status; (ii) status determines pay; (iii) each determines the other; and (iv) neither determines the other, the observed connection between them resting upon their association with other factors. For all practical purposes, Brown considers only the first two of these possibilities, associating the first with the perspective of economics and the second with that of sociology. Numerous studies have shown that the social grading of occupations, that is, the status accorded to them by samples of the public, is positively associated with the income levels of their incumbents. Although the correlation falls short of perfection, it is quite substantial (*1*). Insofar as occupational rates of pay are determined by market forces, then,

> If the attention of the economist is drawn to the general agreement between the rank orders of occupations by status and pay, he is likely to regard it as an interesting observation, no doubt, but no concern of his; or else he may hazard the suggestion that the same capabilities as command a higher rate of pay as a fact of the market also command higher esteem. . . . Then can it be that the rate of pay, determined as the economist believes it to be, is in turn the principal determinant of the status assigned to the occupation concerned? The sociologist raises the opposite possibility, that it is the status that determines the pay: people generally feel it is only "right and proper" that an occupation of higher status should have higher pay, and this consensus brought to bear through custom or negotiation or award puts and keeps the relative pay where it is [p. 19].

The possibility that occupational pay and status are not themselves causally connected is not considered by Brown, despite the fact that it is embodied in the functional theory of stratification that has been a source of continuing debate among sociologists (*2*). Pay takes several forms, of which money income is but one. Among the other components of pay one would include the various forms of income in kind, of which board, lodging, health insurance, and retirement benefits are especially prevalent. To these one could plausibly add status. Brown tends to equate pay with money income; the functional theory explicitly recognizes that there are several components to the total rewards (= pay?) associated with pursuing a position: money income is one of them, status is another, and the inherent satisfaction in pursuing the work yet a third. To be sure, the conversion rate between these commodities is not firmly established, and the utility of the particular reward package associated with a position will vary from one individual to the next. If status and pay are part of the same package of rewards, then evidently there is more occupational inequality than one would presume on the basis of either alone. Beyond that, the interesting question becomes not whether pay determines status or vice versa but why they are not always mixed in the same proportion. Apparently the market is segmented into sectors where the indifference curves between status and money among the available pools of workers are not constant. Insofar as that is the case, occupational inequality has a component that is social or cultural, rather than purely economic, since the creation of labor pools that differ and differ systematically in their tastes for pay and status can only be a product of differential socialization and the ways in which the primary agencies of socialization—schools and families—are linked to labor markets. Brown does not broach these possibilities and, indeed, he ignores the literature that bears on the functional theory of stratification.

The remaining possibility, that pay and status determine each other, is likewise ignored by Brown, though in many ways it is perhaps the most intriguing of the four. There is scant doubt that pay can be and is used to secure status in its several manifestations. But status is also a resource that can be converted to cash through exploitation of one's status connections. Surely, the prospect that status and pay determine each other helps to explain the well-established but ill-understood generalization that income and social participation are positively correlated at the individual level. Study after study has shown that higher-income respondents are more likely to belong to voluntary organizations, participate in community affairs, and informally gather with friends, neighbors, business associates, or relatives (*3*). It is of course true that higher-income families are better able to meet the expenditures associated with such activities, but these are not necessarily large. More important, however, since their time is demonstrably more valuable, one would imagine that higher-income persons should participate less rather than more in these activities. Such involvement is, however, both status-producing and status-maintaining; the possibility cannot be ignored that