son why the former should not be incorporated systematically into the conceptual framework in the same way as the latter. A generally similar argument applies to the variable of stratification, in my opinion, although its analytic status, perhaps, is less clear. An advantage of this procedure is that variables which have the same logical status are not assigned different analytic weight; at the same time, the scheme requires the systematic examination of variables whose interaction with kinship may be of a high order of significance. Finally, it seems to me that cross-cultural comparisons which specify the character of the economic and stratification variables in addition to the politico-jural domain of Fortes would yield more precise statements of similarities and differences in kinship structure leading, in turn, to classificatory insights which could entail further refinement of the conceptual framework.

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On the Nature of Science

The Methodological Heritage of Newton. Based on a conference, London, Ontario, April 1967. ROBERT E. BUTTS and JOHN W. DAVIS, Eds. University of Toronto Press, Toronto, 1970. xii, 172 pp. $5.50.

Crossing the boundary of two related—but often compartmentalized—fields, this collection of essays on the methodological heritage of Newton has a message for both the historian and the philosopher of science. The message is twofold: (i) that the history and philosophy of science are in many ways concerned with the same question (fundamentally, "What is science?"); and (ii) that from their different standpoints practitioners of each field have a lot to tell those of the other.

Neither historians nor philosophers should be surprised to learn that Newton's influence extends far beyond the confines of science per se to the broader realms of methodology and philosophy. One of the major themes uniting this collection of essays is the documentation of that influence. The essays of F. E. L. Priestley, John W. Davis, Gerd Buchdahl, L. L. Laudan, and Robert E. Butts together argue the profound effect of Newton's ideas on discussions of scientific methodology and epistemology in the century following his death. The most striking impact, as one might expect, resulted from Newton's introduction of force into the conceptual framework of science, and from his concomitant disavowal of hypotheses. Buchdahl argues—and the theme is implicit in the other essays mentioned—that the introduction of force (in modern language, a theoretical term) ultimately resulted in a change in the metaphysical description of the physical world. Explanations were no longer restricted to the terms of the orthodox mechanical philosophy, matter and motion, but could also be couched in terms of various attractive and repulsive forces. Such a change of conceptual framework is bound to have had far-reaching significance. Eighteenth-century discussions of space, matter, method, knowledge, and God's role in the physical world all followed directly from Newton's introduction of forces.

As the essays of Hanson and Feyerabend reveal, Newton's influence in the philosophy of science extends beyond the 18th century up to present discussions of the structure of science. Contemporary discussions between the traditional positivistic philosophers of science (Hempel, Nagel, Reichenbach, *et al.*) and the new breed of philosophers (Hanson, Feyerabend, and Kuhn) can be viewed as yet further examination of Newtonian methodology. Does science proceed from neutral facts to general theories that represent continually closer approximations to the truth, as the "classical empiricists" (Feyerabend's phrase for the Newtonians) would have us believe? Or would the scientific endeavor be more appropriately described in other terms entirely? For example, Feyerabend argues that perhaps there do not exist any neutral (theory-free) facts to serve as a starting point. Perhaps some radically different description of science is needed.

Whatever the outcome of this debate—probably the most significant discussion taking place in the history and philosophy of science today—the debate raises the perennial question of the interrelation between the history and philosophy of science. The essays of Hanson and Feyerabend illustrate how deeply the historians and philosophers can affect each other, if they choose to take each other seriously. They have shown that if philosophy of science grows out of a close examination of the history of science, striking insights into the nature of science can be gleaned, insights which simply do not arise in more traditional philosophy of science which, at best, simply uses history as a convenient source of examples. The historians likewise stand to gain from this mutual relevance, a fact evident from the influence of the new philosophy of science on the thinking of historians of science. The whole issue of the role of conceptual frameworks (paradigms) in determining the characteristics of science in a given era—an issue clearly evident in the more purely historical essays in this volume—would not arise in the absence of serious philosophical thinking on the part of the historians.

In addition to the intrinsic value of the essays themselves in unraveling historical and philosophical questions regarding the methodology of science, this collection raises broader questions concerning the direction in which the field seems to be heading. From either point of view, it should be of interest to anyone seriously interested in the nature of science.

The utility of this interesting book is somewhat diminished by the absence of an index.

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Possible Biological Models

Fish in Research. A symposium, Vermillion, S.D., Nov. 1968. OTTO W. NEUHAUS and JOHN E. HALVER, Eds. Academic Press, New York, 1969. xii, 312 pp., illus. $8.50.

The participants in this symposium were asked to look at their areas of research and consider "what unique information of biochemical and physiological processes can be gained by using fish as experimental animals." As expressed in the welcoming address the challenge was "not so much to review what is known concerning fish, but to determine how studies on fish can yield unique insights into biochemical and physiological phenomena." The 16 contributions are grouped according to four major topics: cancer, metabolism, genetics, and nutrition.

Although some of the authors are content to review their own recent research, several in each section take the opportunity to stress the unique findings arising from research on fish and the importance of fish as model systems for fundamental biological stud-