

fortunately, the authors have not provided enough technical detail to enable one to judge the quality of the results. Nor do they spend enough time telling the reader what the results mean. The basic numerical results are presented in tabular form, but they are discussed in rather general terms. It would have been more useful to triple the amount of space devoted to the explanation and justification of these models, perhaps at the cost of the redundant material at the beginning of the book.

After reporting the results of their basic models, the authors go on to a number of extensions and replications of them. Space does not permit a detailed discussion here, but the material on women, the development of scales of substantive complexity of housework, and a discussion of attempts to replicate the basic model in a number of other societies are all quite informative. In many ways, these extensions are the most interesting aspect of the book since at least some of the material has not been published elsewhere.

Each chapter of this long book ends with a careful discussion of the various unresolved issues and possible sources of error in the analysis, and the book itself ends with a similar discussion. The authors' candor is admirable, and they themselves raise each of the following issues, among many others, which I think cast some doubt on the validity of their results. First, although much is made of the value of the longitudinal design it is important to understand that the sample ranges in age from 26 through 65 at the time of the second interview. Ideally, to study how job conditions affect psychological functioning, one would study a cohort of young people as they enter the labor force. In the present case, we have estimates based on men who are in their first years in the labor force and men who are about to leave it. One has to believe that the impact of job conditions on men who have been working for 30 years is different from their impact on new workers. Thus the coefficients in these models are "averages" across potentially quite different situations.

A second issue has to do with the interpretation of reciprocal effects in models of this kind. A feedback loop does not imply that change must be going on at all times. The authors write, on occasion, as if they have estimated dynamic models, but they have not; indeed, their models assume a system in equilibrium.

The models they estimate are extremely ambitious, to say the least, and one

has to question the stability of some of the results, given the rather tenuous assumptions used to obtain causal estimates in some cases. At times, it appears that results have been achieved by testing prior models to see if particular coefficients are statistically zero, then using that information to obtain results for more complex models. This is not a desirable procedure.

The work reported in this book is important and pathbreaking. The principal authors, Kohn and Schooler, have mounted a tenacious long-term attack on problems that have almost defied solution. Their analyses use the most sophisticated statistical methods available and are generally well done. Still, the issue is not closed. Though all the evidence points to the basic validity of the hypothesis—occupational experiences do affect how people think about themselves and the world around them—the specific coefficients in most of these models cannot be taken as gospel. The data from this study, though certainly better than anything else currently available, are not optimal for the task at hand. One would prefer data on a single cohort at labor force entry with far more frequent measurement.

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Ethics in Neuroscience

Ethical Questions in Brain and Behavior. Problems and Opportunities. DONALD W. PFAFF, Ed. Springer-Verlag, New York, 1983. viii, 158 pp. \$19.80.

For most of its history, with the exception of studies in the behavioral sciences, research now grouped under the rubric of the neurosciences has primarily been directed at elucidating the basic mechanisms of brain function: electrical, chemical, anatomical. In the last decade, research at the histological, cellular, and subcellular levels has begun to be joined with behavioral studies, as is evidenced in the psychopharmacological approach to mental illness and in many developmental studies. As the basic biological components and mechanisms of nervous system function are identified and their roles in behavior investigated, their social ramifications and accompanying ethical implications become more extensive, more diverse, and more in need of careful consideration. A volume focused on ethical concerns of particular rele-

vance to brain and behavior is timely indeed.

This volume, which is based on a lecture series, is divided into two sections. The first explores some of the ethical issues that arise in dealing with neural and behavioral disorders, and the second examines the ethical implications of various research findings in the biology and neurology of behavior.

In section 1, a chapter by Jean Endicott and two chapters by Ruth Macklin are especially perceptive and provocative. The Endicott chapter deals with the methods, goals, and responsibilities of making psychiatric diagnoses. It considers the dangers and potential for abuse associated with such diagnoses in our society, where the maintenance of confidentiality and privacy may be difficult, where misconceptions and fears about mental illness are widespread, and where there is the potential for social stigmatizing. The author recognizes that at the same time society has expectations, and is likely to expand them, with regard to predictions of behavior based upon diagnosis and to the responsibility mental health care professionals have to warn of the risk of suicide and violence that is associated with particular diagnoses.

One of the chapters by Macklin deals with the problems associated with obtaining informed consent from and for the cognitively impaired and the other with the refusal of treatment. Both deal thoughtfully with the issues of autonomy, with paternalism, and with how and by whom the "best interest" of the patient may be determined.

A chapter by David Levy dealing with comatose patients is informative and interesting though it is restricted to discussion of the likely prognosis for the unconscious patient and does not actually address ethical concerns associated with the condition, such as how limited resources are to be allocated and whether care should be continued. A chapter by Richard Beresford on legal aspects of treatment of the cognitively impaired is disappointing. It implies that the ethical problems associated with withholding or withdrawing life support can be, and indeed should be, resolved by the medical and legal communities, without the need of input from other segments of society.

Arthur Caplan examines the implications of sociobiological theory for morality. This is a scholarly and intellectually exciting essay, particularly when viewed in the context of the neurosciences, which extend from the level of molecules and genes, units fundamental to evolution, to behavior, an essential for ethics.

The presentation of the "old" and "new" sociobiology and the examination of their significance for ethics are clear and stimulating.

Jerram Brown discusses cooperation and competition as the paradoxical goals of cells and organisms. Much of the discussion is interesting, but the view that cooperation and competition are the sources of morals and ethics is questionable and the focus on the major histocompatibility complex and its potential role in mate selection is confusing and seems wildly speculative.

Colin Beer provides a fascinating exploration of intentionality but skirts the ethical issues that this topic raises and that are mentioned in his introduction and conclusion—that is, the issue of animal rights and the relationship between sentience and humane treatment of animals. A discussion of these issues might well have been included in a monograph on ethical concerns of particular relevance to neuroscience.

The final chapter, by Pfaff, broaches the topic of a neurobiologically determined and therefore universal ethical principle but concludes with an oversimplified analysis of the components of ethical behavior determined by such an ethical principle. Yet the idea that human values have neurobiological origins and the idea, suggested by Caplan, that there may be biologically determined limits that could realistically constrain ethical ideals, should be investigated further.

This volume only partly fulfills the goal set forth in the introductory chapter, "to include informed discussions of the most difficult theoretical problems and statements of the theoretical opportunities encountered at the interface between ethics and modern neurobiology." Some of the thorniest and most compelling topics that occur to a neuroscientist reflecting on potential ethical ramifications of the work in this field are not mentioned in the book. Such issues include not only the use of animals in pain research but also the role that social values and assumptions play in determining the direction of research and in influencing the perception and interpretation of data, and the potential for producing false expectations and spurious treatments for mental illness and social ills that emphasis on neurobiological factors to the exclusion of psychological and social ones can create.

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Adaptive Strategies

Behavioral Energetics. The Cost of Survival in Vertebrates. Papers from a colloquium, Columbus, Ohio, Oct. 1980. WAYNE P. ASPEY and SHELDON I. LUSTICK, Eds. Ohio State University Press, Columbus, 1983. xii, 300 pp., illus. \$27.50. Ohio State University Biosciences Colloquia.

This book is a collection of nine papers derived from a colloquium. It is dedicated to the memory of William Keeton, whose death in August 1980 prevented his participation in the colloquium. The contributions reflect the goals of the editors to synthesize information from ethology, ecology, and physiology as it relates to energetics and adaptations of vertebrates. The various chapters are organized about three survival strategy themes: "making your way," "reproduction and aggression," and "cost-benefits of temperature regulation and foraging."

The book is a readable synthesis of literature that will interest both specialists and students. It includes information touching on many of the topics suggested by the title: energy budgets for growth and metabolism, reproductive strategies, territoriality, costs of aggression, energetic consequences of ectothermy and endothermy, activity and foraging energetics, optimal foraging, feeding behavior, heat balance and thermoregulation. There is in it a reasonably satisfying blend of theory, mathematical models, and empirical data, but the blending and the level of analysis vary greatly from paper to paper. Some of the papers are reviews and others are case studies, and two of the contributions do not directly address the subject of energetics. Thus Melvin Kreithen's paper is strictly a descriptive review of orientation and navigation mechanisms in birds, and Cathleen Cox analyzes costs of breeding attempts by elephant seals solely on the basis of behavioral data.

Two ideas are held to be centrally important by the editors and are reflected in various of the contributions. One is the value of integration of disciplines such as ecology, ethology, and physiology for understanding the survival strategies of animals. In this regard Harvey Pough's chapter is perhaps the strongest and most eloquent contribution. He discusses how ectothermy and the metabolic organization of amphibians and reptiles account for ways in which their behavioral ecology differs from that of endothermic birds and mammals. Amphibians and reptiles are generally adapted to low energy flux but high efficiency of biomass production. Pough's discus-

sion of this subject is a masterly synthesis of mechanistic physiology (which is scant among the other chapters), descriptive life history, ecology, and behavior throughout which the focus remains clearly on energetics.

The second idea is that animals that obtain food, avoid predators, and reproduce at the least cost of energy can be considered the most fit. Many of the authors appear to accept this hypothesis, yet the papers provide little conclusive evidence that economy of energy expenditure does maximize fitness. Some have a good handle on measures of fitness but no correlative data on energetics, and others present comparisons of energy costs but lack correlative measures of fitness. In either case, there is little or no discussion of whether or not a population or species is actually energy-limited. Natural selection, of course, favors whatever works. An energetically costly mode ought to "work" if the necessary energy is freely available, and the availability of energy would therefore seem to be as important a consideration as are the energy costs that are emphasized in this book.

The measurements and estimates of energy costs (or gains) discussed throughout the book include some interesting and sometimes new information. John Brett's analysis of salmon energetics presents energy budgets for each stage of the life cycle. This level of detail is evidently attempted here for the first time. In broadest overview, however, much of the information in this book is already available or familiar. It is disappointing that the book includes no contribution from anyone using radioisotopes to measure field metabolic rates, for the use of this technique is fostering a substantial growth of meaningful energetics analyses for animals in natural settings.

The book is attractively printed, has an index, and contains only a few typographical errors. The small number of editorial deficiencies include the presence of jargon ("lab" for laboratory), tense switching within paragraphs, a few ponderous statements, and incorrect equations (equating units of temperature with units of heat flux).

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Books Received

Assessing the Impacts of Information Technology. Hope to Escape the Negative Effects of an Information Society by Research. Norbert Szyperski *et al.*, Eds. Vieweg, Braunschweig, Germany, 1983 (U.S. (Continued on page 631))