Book Reviews

Behavior and Evolution. Anne Roe and George Gaylord Simpson. Yale University Press, New Haven, Conn., 1958. viii + 557 pp. Illus. $10.

This book is a very carefully organized cooperative effort, the result of two conferences organized jointly by the American Psychological Association and the Society for the Study of Evolution. The planning began under the chairmanship of Anne Roe in 1953, and a first conference was held in the spring of 1955. This was primarily for the purpose of exploring the possibility of real interdisciplinary collaboration and communication, and it was successful enough to lead to the holding of a second conference in the following year, organized with the specific purpose of producing a publishable symposium. Drafts of formal papers were circulated in advance to the participants of the second conference; there they were discussed in a manner that was essentially editorial.

The resulting symposium is, as the introduction points out, a mosaic, but, as the introduction goes on to say, "a mosaic is (or can be) a picture and not a casual assortment of tiles." I think most readers will agree that the organizers and editors have in fact been successful in synthesizing a large variety of contributions from different viewpoints into a coherent general scheme. This is a book, and not simply a haphazard collection of individual items.

Both the topics mentioned in the title, behavior and evolution, are of course enormously complex subjects. No single volume can hope to deal exhaustively with either of them, let alone with both simultaneously. For the purpose of a symposium designed to cover, if not all possible aspects of behavior and evolution, at least a wide and representative range of them, it was necessary to select some focal point around which the various contributions would be integrated. This focus is explained in the introduction in the following words: "To demonstrate that morphology, physiology and behaviour are aspects of organisms all inseparably involved in, and explained by, the universal fact of evolution became a principle object of this symposium. . . . Behaviour itself, what it is descriptively and how its different aspects may be explained and interrelated through evolution, is the very heart of the book's theme."

The book starts, therefore, with a general statement of the status of evolutionary theory of the present day. A chapter by Simpson gives a summary account of the modern neo-Mendelian, or "synthetic," theory and sketches the general principles which have emerged from paleontological study, and Colbert and Romer provide some examples, mostly from vertebrates, of the conclusions that can be drawn from comparative and anatomical studies as to the relations between evolutionary morphology and behavior. After this introduction to the basic evolutionary ideas, the second part provides a background for an understanding of the physical basis of behavior. Beach discusses the evolutionary aspects of psychoendocrinology; Caspari and Sperry deal respectively with the genetic and developmental bases of behavior; and Pribram and Bullock discuss the evidence from comparative neurology and neurophysiology.

These two introductory parts bring us to the core of the book, a series of seven chapters entitled "Categories of behaviour." In the first of these, Nissen discusses the various ways in which behavior may be classified: for instance, by its function, such as reproduction and dispersal; by descriptive categories, such as social behavior; or by the kind of mechanisms involved, such as tropisms and conditioning. He concludes by a suggestion that the behavior of any animal could be scored according to its effectiveness in six functional categories (sensory capacities, locomotion, manipulation, perception, sensory motor connections, and reasoning) and advances the hypothesis that if at a series of geological epochs the highest-scoring species at each of these points were taken, we would find evidence for some over-all consistency in the direction of behavioral evolution. This is, of course, to suggest that the evolutionary process does manifest a general direction of change—a concept which has often been referred to as evolutionary "progress," unfashionable though that word may be at this time.

In later chapters of this section, some examples of the various categories suggested by Nissen are discussed in more detail. Marston Bates reviews food-getting behavior, mostly in insects and vertebrates; Carpenter deals with territoriality; while Thompson and Emerson discuss social behavior in general, and the evolution of behavior among social insects. In a very stimulating chapter, Harlow considers the evolution of a behavioral mechanism—namely, learning. He pays more attention than is usual in such discussions to the learning abilities of quite lowly forms such as flat-worms, and he argues forcefully that "there is no evidence that any sharp break ever appeared in the evolutionary development of the learning process."

An article of a rather different kind is that of Hinde and Tinbergen, who discuss the comparative study of species-specific behavior and point out "that the comparative study of behaviour can yield the same type of results as comparative anatomy—a tentative description of the course evolution has taken." They support this by a detailed study of the behavior of certain nearly related species, using the concepts and methods of the "ethology" school. A similar conclusion is reached by Mayr in a chapter entitled "Behaviour and systematics," which deals with the subject from a broader comparative point of view. This leads on to two chapters in which behavior is discussed as a part of the evolutionary mechanisms. Spieth shows that the reproductive isolation between species often involves a behavioral sexual-isolating mechanism, while Pittendrigh discusses behavior as an aspect of adaptation, subject like morphological and physiological adaptations to genetic variation and selection.

This brings us to the penultimate section of the book, on evolution and human behavior. Washburn and Avis begin by a comparative review of the behavior and correlated functional adaptations of monkeys, apes, and man. We then pass on to three fascinating and stimulating chapters in which concepts derived from the theory of evolution are applied to higher human cultural behavior. The subject is approached in turn from a general biological, a psychological, and a cultural anthropological point of view. When it is mentioned that the authors are Julian Huxley, Freedman and Roe, and Margaret Mead, the reader will easily realize that these chapters, short as they are, are packed too full for it to be possible to indicate the nature of their contents in a short review.

The book concludes with an epilog by G. G. Simpson, who makes a manful and indeed remarkably successful attempt to synthesize the enormously varied contributions of the earlier authors. The success of Simpson's epilog is in fact a demonstration of the real unity which the book possesses; it shows that an account can be given of animal behavior, and at least to some extent of human, in

which the theory of evolution provides just as effective an intellectual framework as it can do for a textbook of comparative anatomy.

If a word of criticism were to be offered, it might be this: The relation of the behavior of an animal to the evolutionary process is not solely that of a product; behavior is also one of the factors which determines the magnitude and type of evolutionary pressure to which the animal will be subjected. It is at the same time a producer of evolutionary change as well as a resultant of it, since it is the animal's behavior which to a considerable extent determines the nature of the environment to which it will submit itself and the character of the selective forces with which it will consent to wrestle. The various types of "feedback" or circularity in the relation between an animal and its environment are rather generally neglected in present-day evolutionary theorizing. One might have hoped that the complexity of this relationship would be more explicitly taken into account in a book concerned primarily with behavior and evolution, since it is in relation to behavior that the circular relation is perhaps most obvious. However, although such considerations are perhaps often just below the surface of the problems discussed by the various authors, they never seem to emerge completely into the light of day. For instance, when Pittendrigh writes that his "assigned task in this symposium was to discuss behavior as adaptation," I would have liked to see him go on to state that the adaptation must be to circumstances which arise largely as a result of the behavior. Again, Spieth, in his extremely interesting discussion of the role of behavior in the reproductive isolation between closely related species, never quite gets around to discussing how far the behavior itself has played a role in the production of the differentiation between the species. There is here, I think, waiting to be developed, a synthesis between evolutionary theory and the study of behavior which goes even deeper than that recorded in this symposium.

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Human Dissection. Its drama and struggle. A. M. Lassek. Thomas, Springfield, Ill. 1958. 310 pp. Illus. $6.50.

All scientific men are aware of the effort, the long hours, the frustrations, and often the personal danger involved in the tasks they have chosen to do. Some sections of the public may be interested in scientific things, but other people are at times very resistant toward nontraditional ideas. In two fields—namely, animal experimentation and human dissection—obstructions have developed, not because of the ideas involved, but because of the materials and methods used for investigation and teaching. The history of the use of animals remains to be written; this book, however, does an admirable job with the story of dissection—its impact, the personalities involved, and the emotional milieu at different times and places.

Anatomy, like other academic areas, has immediate concern for only a small but selected minority. Today, for instance, an adequate amount of dissection material for teaching and research would be supplied in most states having medical and dental schools by about one body per 200 deaths. Few places now have even this much material to work with; the whole history of dissection, except perhaps for continental Europe during the 18th and 19th centuries, reflects an inadequate supply.

Lassek has made an interesting and careful compilation of accounts from many sources for this history. It relates to the whole span of anatomical study, from ancient times to 1958. About a third of the book deals with pre-Vesalian anatomy; another third is concerned with dissection in Europe and Asia, while the remainder covers dissection in America. The book shows a broad perspective; the author pictures an age-long struggle between effective pedagogy and the search for knowledge on the one hand and prejudice, noncooperation, and obstruction on the other.

Death is an incomprehensible event. Primitive ideas—spirits, mysticism, fear, ritual—have always had an effect on the manner in which people treat their dead. Lassek properly emphasizes this point. Problems have been most complex in the British Isles and in America, where legal provisions for anatomizing have lagged in relation to the demand for trained medical men. People have been disturbed—this was especially true during the 100-year period from 1775 to 1875—by the activities of "gentlemen" resurrectionists (that is, surgeons and medical students) and by hoodlums who engaged in grave robbing. The methods used, the squabbles with the law, the notorious cases, the murders for profit, and the riots of outraged townsfolk are described in detail. The need for good anatomical laws and the pressures on legislators are outlined.

Lassek also gives enough biographical data on about twenty of the key anatomists of the past 2000 years or so to make one appreciate the drives that motivated these men. He tells of spectacles of the 16th century where the bodies of criminals were dissected and demonstrated before students and "important" people. There are stories also of the surgeon-anatomists of the 18th and 19th centuries and of the improvements in instructional standards in the 20th.

Lassek has not only presented a history; he has laid out the background for the persisting problem of cadaver shortage that also plagues present-day anatomists.

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Tribes that Slumber. Indian times in the Tennessee region. Thomas M. N. Lewis and Madeline Kneberg. University of Tennessee Press, Knoxville, 1958. xi + 350 pp. Illus. $3.75.

"This book has been written for students, for amateur archaeologists, and for all persons with curiosity about the Indians" (preface, page v.).

The organization and literary style of this book, enhanced by a most attractive binding and beautiful illustrations, set a high standard for popular writing on American archeology. Since this is the first contemporary book in the field to be written by professionals for persons without advanced technical training, it is well that the standards are so high. Certainly American archeology needs more in the way of good publication for this audience, and it is expected that this book will serve, in some degree, as a model.

Chapter headings include "Nomadic hunters of the Ice Age," "The Archaic era," "Early Woodland Indians," and "Burial Mound Builders." The later and more elaborate Dallas, Mouse Creek, and Historic Cherokee cultures, Busk-Southern Cult ceremonialism, and Cherokee ceremonialism and history are well described and made the subjects of generalized interpretative treatment in the other chapters. Ten thousand years of the prehistory and early history of the Tennessee area are covered.

The first two chapters are sufficiently general to be of considerable interest in the eastern United States as a whole. The later chapters describe and interpret phenomena restricted rather more to Tennessee, although the interpretations are of much wider application.

A real virtue of this book is the constant interpretation, in cultural terms ranging from the general to the specific, of archeological phenomena by means of information culled from accounts of historic tribes. The descriptions are of prehistoric cultures with some life, not of artifacts and structural remains alone. But—a valuable part of interpretation—there are very well-presented and well-illustrated descriptions of artifacts, techinques, and technological processes.

Professional archeologists will find