Book Reviews

Chelonia mydas

The Green Turtle and Man. James J. Parsons. University of Florida Press, Gainesville, 1962. x + 126 pp. Illus. $8.50.

This attempt to summarize the totality of man's relationship to an important reptilian species shows to advantage the pleasing range over many disciplines that makes good geography such a valuable contribution to modern scientific literature. History blends with anthropology and sociology; ecology, zoogeography, and economics integrate with these and other disciplines to tell a fascinating story which preserves scientific accuracy but escapes the monotony of the separate specialized source works drawn upon.

In the foreword, Archie Carr, the green turtle's keenest student and strongest advocate, nicely sets the scene for Parson's scholarly thesis. The first chapter, a well-rounded essay in itself, deals first with the biology of the species and then moves on to a discussion of human cultural attitudes toward the sea-turtle and a history of its exploitation. There is necessarily some overlap between portions of this first chapter and the second chapter (about half of the book), a historical survey of most of the world's turtling grounds. Following this are short accounts of the use of suckerfish in turtling and of the exploitation of the South American river turtle, *Podocnemis expansa*, a discussion of the future prospects for *Chelonia mydas*, and an account of present conservation work in the Caribbean area. Although the account of the freshwater turtle *Podocnemis* is well-written, it seems out of place in this book.

Parsons has been very successful in his delicate task of combining knowledge from various specialized fields, and only a few errors and omissions are noteworthy. Modern Thais may *say* that the eating of turtle is "unthinkable" (p. 9), but my Thai friends agree that their countrymen fail by the tens of thousands to *demonstrate* this aversion. *Batagur baska* is not a "land tortoise" (p. 54), but a large river terrapin much like *Podocnemis* in habits. Old Sarawak turtle hands will no doubt be confused by the "Semah" photo on page 10, which presumably was taken on the nearby coast of the main island of Borneo rather than on Palau Talang Talang Besar. It is unfortunate, but perhaps understandable, that the sizeable population of green turtles that nest on the beach at Hamke's Bay, a few miles out of Karachi, West Pakistan, is not recorded on the distribution map (inside the front cover) nor mentioned in the text on pages 53 and 54. When I visited the area with a party of enthusiastic Thais, we found a plentiful number of nesting females, the largest individuals we had seen; neither eggs nor adults are molested by man, so far as we could determine, and this nesting concentration seems to have escaped scientific notice heretofore.

This is a good book, important to the specialist and—surely—of great interest and value to the general reader.

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Primatology

Primatologia. vol. 2, No. 1, pt. 6, *Sehorgan.* J. W. Rohen. Karger, New York, 1962. 210 pp. Illus. SFr. 75.

This is another section of the well-known handbook of primatology, *Primatologia.* The author has made extensive use of the literature to present a comprehensive and useful synopsis of the gross and microscopic anatomy of the eye throughout the order Primates, from Tupaiiformes to Hominoidea. The following list of topics dealt with will serve to give some idea of the scope of its contents: form and size (both absolute and relative) of the eyeball; position of the eyes, convergence, and visual field; bulbus oculi (retina: including microscopic structure, histochemistry, blood vessels, functional considerations; iris; ciliary body; choroid and ocular blood vessels; cornea and sclera); lens and zona ciliaris; vitreous humor; extraocular muscles; lids and tear-glands.

The list of references comprises 230 items. Unfortunately, even a casual inspection reveals that it contains a number of inaccuracies. Although most of these appear to be of a minor nature, there is at least one glaring error. The cited publications of D. G. Elliot and G. Elliot Smith have been confused. Thus, that of the former (1913) and two of the latter (1924, 1928) have been incorrectly attributed to "Elliot-Smith, D. G."

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Population Ecology

Animal Populations. T. O. Browning. Harper and Row, New York, 1963. 127 pp. Illus. $2.50.

This small book, which is intended as a nontechnical discussion of population ecology, concisely summarizes a considerable body of information without unduly oversimplifying facts. It is, in a sense, the third generation of a set of ideas and opinions that were first comprehensively enunciated by Andrewartha and Birch (*The Distribution and Abundance of Animals*, University of Chicago Press, 1954); thus it is largely derivative. Populations are regarded as being regulated by weather, resources, other members of their species, other species, and hazards. Mechanisms of regulation and interactions between them are illustrated by a number of examples, drawn largely but not exclusively from the entomological literature. The rationale underlying the discussion is perhaps best exemplified by a quote from Bacon which serves as a frontispiece: ". . . it is plain that the more you recede from your grounds, the weaker do you conclude; and as in nature, the more you remove yourself from particulars, the greater peril of error do you incur. . . ."

At this level it is probably legitimate to approach principles merely by means

of illustrations; however, the lack of more rigorous treatment does rob the conclusions of some of their force. Browning makes no attempt to integrate populations with related topics, such as community energetics or evolution. One is a bit puzzled by his description of other, less circumscribed works in the field as "alternative points of view." The discussion of human populations, a brief concluding chapter, is less than impressive, and an attempt to put together the pieces of an approach that, by itself, strikes one as unnecessarily atomistic, would have been more useful. This is particularly true with respect to rather exciting advances which have been made during the last few years in attempts at synthesis, but which are not mentioned for lack of space. Within these limitations, however, this is quite a good introduction that can be commended for its care in preparation and its reasonable price.

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Quantum Theory

Quantum Mechanics. vol. 1, *Old Quantum Theory*. Sin-Itiro Tomonaga. Translated from the Japanese by Koshiba. North-Holland, Amsterdam; Interscience (Wiley), New York, 1962. xvi + 313 pp. Illus. $12.50.

It has always been my opinion that the only way to teach physics at the graduate level is by combining a quasi-historical approach with the usual quasi-deductive method. This is especially true in quantum theory, for quantum theory is far from a closed subject and can therefore be appreciated and learned only by following its historical development. Although this is often recognized, it is rarely practiced. In most textbooks the student is led as quickly as possible to the technical mathematical aspects of the theory, since these are easy to teach and, therefore, supposedly easy to absorb! It is a pleasure to see that Tomonaga does *not* follow this example.

In this first volume of a projected three-volume treatise, which is translated from the Japanese, Tomonaga, with great skill and taste, presents the development of the quantum theory from the basic papers of Planck and Einstein through Rutherford's discovery of the atomic nucleus and Bohr's theory of atomic structure to Bohr's correspondence principle and the discovery of the matrix mechanics by Heisenberg. Of course the treatment is quasi-historical. The author says in the preface that he did not intend to write a book on the history of science and that he has arbitrarily rearranged the material to elucidate as clearly as possible the thinking of many geniuses. Of course, not everyone will agree in detail with Tomonaga's arrangement. I would have given more emphasis to the interference experiments and the superposition principle, and I would not have omitted Einstein's 1917 paper on radiation theory. But one must say that in general, the author has been remarkably successful in capturing the real spirit of the development of the quantum theory. I admire especially chapter 5, on the birth of matrix mechanics.

The writing is very clear, and the mathematical apparatus is kept at the irreducible minimum. The book is also self-contained so that it can be used as a text book. In the second volume the author intends to treat, in the same manner, the development of wave mechanics, and the third volume will conclude with a systematic and deductive presentation of the whole theory. If the author fulfills the promise of this first volume, we will finally have a treatise that can be recommended without reservation to the serious student for self study or which could be used admirably in a three-semester course in quantum mechanics.

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Creativity in Mathematics

Mathematical Discovery on Understanding, Learning, and Teaching Problem Solving. vol. 1. George Polya. Wiley, New York, 1962. xv + 216 pp. $4.75.

This is the first of two volumes that will be devoted to problems which require the use of only the rudiments of algebra, geometry, and trigonometry, including some graphing. The object is to teach, to the extent possible at this elementary level, creativity in mathematics.

Among the "brain teasers" treated, we find such problems as that of determining the number of hens and the number of rabbits owned by a farmer who knows that his hens and rabbits have a total of 50 heads and 140 feet. Later problems are gradually directed toward the use of general methods, particularly that of recursion, or induction, and the scope is eventually widened to include crossword puzzles, the thread of Ariadne, preparation for Halloween, and other nonmathematical contexts.

The precise problems are, perhaps, not important; what matters is the challenge that each problem presents, and the manner in which the problem is used to instruct and encourage the student. Thus, several methods for solving the problem of the number of hens and rabbits are given and generalized, and the different approaches are compared with one another. One solution begins with the suggestion that each hen stand on one leg, and each rabbit on its hind legs. Only 70 legs are then in use, and this number is identified with that of the heads of the hens, taken once, together with the heads of the rabbits, taken twice. By subtracting all the heads, taken once, we are left with 20 (heads of) rabbits, and so 30 hens.

Much of the book is directed about equally to gifted students and to their teachers, including the whole hierarchy of teachers of teachers and teachers of teachers of teachers; doubtless the latter category includes parents, if teachers learn anything from their criticism. Indeed, teachers have really far more to learn than their pupils, if the priceless gift of creativity is to be preserved. In this respect, it is typical of the author's delicate handling of minds in the process of developing, that he refers favorably to incorrect guesses, instead of indulging in the traditional caustic comments.

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Physics Textbook

Introductory Atomic Physics. M. Russell Wehr and James A. Richards, Jr. Addison-Wesley, Reading, Mass., 1962. xi + 420 pp. Illus. $8.75.

The authors have attempted to make this book more readable by using a deliberately unpedantic style. I prefer such a style for an introductory text-