

Book Reviews

Cetacea

Whales. E. J. Slijper. Translated by A. J. Pomerans. Basic Books, New York, 1962. 475 pp. Illus. \$12.50.

This book greatly exceeds earlier works in the amount of knowledge of living whales, dolphins, and porpoises contained. Of course it derives superiority in part from new knowledge made available by the rapid recent growth of successful research but also in part from what must have been virtually a vacuum-suction method employed to assemble the material. That nine of the fourteen chapters treat structural and functional aspects of cetacean biology reflects Slijper's principal research interests, but he also devotes chapters to behavior, distribution and migration, evolution, the history of whaling, and the future of whaling. Until it is superceded, the book will unquestionably be the most used single work on the mammalian order Cetacea. An objective evaluation is offered here to help those who use the compilation decide to what extent the information that it provides can be accepted without checking.

A 3200-word review published in the *Norwegian Whaling Gazette* (December 1962) objectively cites many ostensible errors in Slijper's *Whales* and offers corrections. Half of those criticisms are confined in chapter 1, "Historical introduction," and another quarter are devoted to the final chapter, "The future of whales and whaling." To avoid duplication, and to provide thorough treatment of a representative sample, my criticisms are limited to chapters 6, "Behavior" and 10, "Feeding." Slijper, Director of the Zoological Laboratory at the University of Amsterdam, is well known for his scientific work and for his inclination to capture the reader by a pictorial

presentation of important knowledge, and he has enriched this book with 229 figures in 415 pages of text.

Perhaps to attract the layman's attention Slijper has, however, been occasionally sensational and often a little careless with facts. In the example that follows objectionable parts are italicized: "... there is the *absolutely authentic* story of a dolphin saving the life of a woman off the coast of Florida in 1949. This woman, while bathing, was carried *out to sea* by a strong current when a Bottlenose Dolphin ... pushed her violently *towards the surface* and then toward the beach, until *she could stand on firm ground*" (page 196). Slijper gives no reference, but the original story is from the Letters department of the November 1949 issue of *Natural History* (58, No. 9, pp. 385-386). The following corrections of Slijper's errors are provided from that original account: (i) the event occurred six years earlier; (ii) the woman said she was "only about ten feet from shore"; (iii) she distinguished no push "towards the surface"; and (iv) the shove put her up "... on the beach, face down, too exhausted to turn over." With respect to the absolute authenticity that Slijper recklessly alleges for this story, we may note that the woman remained anonymous; that she wrote the account six years after the occurrence; that, according to her letter, she lay face down for several minutes before she could even look up, and that later still, after she had gathered enough strength to get up and climb some steps, an unknown man arrived who, she says, told her he saw a "porpoise" push her ashore, and who also averred he had seen this happen once before.

On eight occasions in these two chapters Slijper produces a generalization evidently based on only from one to three items of evidence (pages 181, 188, 190, 195, 197, 199, 288, and

291). In six instances (pages 190, 199, 254, 255, 259, and 269) he makes a declaration and then contradicts it within a few paragraphs—for example, "... dolphins ... and indeed all other Cetaceans, are herd animals." (page 190, line 14) but "... the Pigmy Sperm Whale seems to avoid his fellows almost completely" (page 191, line 36). Another example: "... in fact, food supply faces whales with problems already" (page 255, line 7) but "... there is so much krill that even the greediest whales need never go short" (page 257, line 16).

In a volume translated from the Dutch one can bear such an infelicitous ambiguity as plankton occurring "... up to five fathoms down" (page 255). But can it be translation that produces such non sequiturs as this: after he has informed the reader that the male narwhal's tusk is so exceedingly fragile that it is not used for breaking ice nor for attack or defense, and that during fights in mating season it is carefully kept out of the way, Slijper concludes "... probably it is ... comparable in biological significance with a deer's antlers." (page 281, line 3). Typographical errors are gratifyingly few, but the stomach of a domestic cow does not hold 55 gallons (page 286). There are in the chapters on behavior and feeding at least seven small errors of fact that I recognized without checking sources: for example, (page 179) in Florida waters the bottlenosed dolphin is said (line 14) to be "black on top and white underneath" but is gray, and (line 16) to be "caught easily in nets" but is not, and the native pilot whale there (line 21) is said to be "twenty-two feet long" but it averages much smaller. On the next page (line 16) the Pacific Striped Dolphin, *Lagenorhynchus obliquidens*, is called the "Pacific White-Beaked Dolphin." Three pages later Slijper says (line 2) that the dolphin of Opononi Beach was the playmate of the people "for many years" although it was for but one year.

One intrinsically sensational item that Slijper exaggerates both in a full page illustration (Fig. 154) and in text (page 274), demands comparison with the source. Eschricht's justly famous account of the stomach contents of a 21 foot, 4 inch, male killer whale that he personally examined and reports in detail, is translated into lucid English by a fellow cetologist (*Recent Memoirs*

on the *Cetacea*, 1866, Ray Society, London). Slijper's misrepresentations are italicized: "Eschricht . . . discovered no less than thirteen *complete* porpoises and *fourteen* seals in the first chamber of its stomach ($6\frac{1}{2} \times 4\frac{3}{4}$ feet). A *fifteenth seal* was found in the animal's *throat*." Eschricht says that only one of the porpoises was even "almost entire, most of them [were] half decomposed and only to be recognized by fragments of the skeletons . . . I satisfied myself [as to their number] by only collecting the heads." Eschricht said that upon first opening the stomach ". . . five or six seals, some large, some small, all flayed . . ." were revealed. As further seal bodies were taken out ". . . a couple of them seemed to be fresh flayed, most of them [were] half digested. . . . some only remaining in the shape of loose parts of the skeleton . . . a fourteenth [seal], a very small one, . . . had [passed on] into the second stomach. . . ." The alleged 15th seal Eschricht described as a seal skin clutched in the killer's teeth and empty except for the "crushed head" and "the paws." He considered this skin to belong "to one of the flayed bodies found in the stomach, and, therefore, . . . not to be counted separately."

Thus, Slijper's words and illustrations imply that the first stomach of the killer whale contained 27 whole animals, when in fact it contained the *remains* of 13 skinless, partly digested seals and the *remains* of 13 partly digested porpoises. And the whole seal in the throat was an empty skin in the teeth. Since most of the remains in the stomach were much reduced from their original bulk, Eschricht's original account is quite credible, whereas Slijper's is not.

As a book intended for scientists and laymen alike, Slijper's *Whales* is flawed by these excesses of enthusiasm, by the lamentably high frequency of error, and by the difficulty of checking errors because of inconvenient and inadequate documentation of original sources. As a slightly contaminated fountain of the knowledge, it will nevertheless be truly invaluable to those adequately fortified by the prophylactic of skepticism. Certainly no cetologist can afford to be without the book, and no mammalogist will find a better single compilation on the *Cetacea*.

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Entomology

Insect Pathology. An advanced treatise. vol. 1. Edward A. Steinhaus, Ed. Academic Press, New York, 1963. vxiii + 661 pp. Illus. \$19.

I have a relatively low opinion of multiauthor books, be they textbooks or advanced treatises. But the present volume is exceptional in that a very high percentage of its chapters are really good.

This volume, the first volume of a two-volume work, treats physical injuries, chemical injuries, nutritional diseases, genetic disturbances, tumors, normal microbiota, the effect of vertebrate pathogens on insect and acarine vectors, immunity, physiopathology, predispositions, the nature of infections, the nature of nuclear polyhedrosis viruses, cytoplasmic viruses, the induction of virus infections, granuloses, and Rickettsiae. Only some of these can be singled out for further comment.

The chapter by Day and Oster on physical injuries only points out how little interesting work has been done. Even with respect to radiation effects the data are mostly superficial (the dosages tolerated), with little on the fundamental nature of the effects. Brown follows with an excellent chapter on chemical effects which covers histopathology, symptomatology, and enzyme inhibitions. The chapter by Berg, on genetic diseases, should be useful to those entomologists who need instruction on what can be determined by genetic analyses. Harker's chapter on insect tumors is excellent; unfortunately, little is known about these tumors. Brook's chapter on the microorganisms found in healthy insects is a comprehensive survey, and I wish that she had been allowed more pages to detail the literature more thoroughly. Stephens' chapter on immunity is one of the half-dozen highlights of the volume. In this difficult and controversial field, she does a nice job of presenting the available data and of evaluating it critically, without making the mistake of taking a stand in favor of this or that idea. Arizama's chapter on the nature of virus infections, despite its poor English, gets across the status of the field today.

The truly superlative chapters by Bergold, on nuclear viruses, and by Smith, on cytoplasmic viruses, are the

highlights of the volume. The work on insect viruses, as it is presented by these internationally known leaders, has been important not only to entomology but also to the general field of virology. I recommend these chapters to both entomologists and virologists. Huger deals competently with the granulosi viruses which are less well known, and Krieg treats Rickettsial effects in insects.

No review can do justice to this volume—it can only recommend the volume to those who are interested. When complete (the second volume will cover bacterial, fungal, and protozoan diseases, epizootiology, diagnosis, and the control of insects by microbial methods), this work should not only be a landmark in this field but an indispensable book for everyone concerned with pathological problems in insects.

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Measuring the Earth

Geodesy. Guy Bomford. Oxford University Press, New York, ed. 2, 1962. xvi + 561 pp. Illus. \$14.40.

Three recent developments, the requirements for guiding rockets from point to point on the earth's surface, the very precise determination of satellite orbits from observations at widely spaced sites, and the need to reconcile distances measured into space from terrestrial base lines with direct radar measurements, have led to an increase in the importance of geodesy, the science of measuring the earth on a large scale. Since the first edition of this excellent book was published (1952), the field of geodesy has developed very rapidly, and a second edition is therefore most welcome.

The subject matter has been brought up-to-date by the inclusion of sections dealing with the Tellurometer, with the geometrical and dynamical uses of artificial satellites, and with modern ideas relating to basic aspects of reduction and computation. The book merits high recommendation for use as a textbook and also as a source for general reading by workers in related fields. The material is exceptionally well organized, the writing lucid, and the numerous