

fills a valid need. Because of the weaknesses outlined here, however, the attempted syntheses are unsuccessful.

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## Biomechanics

**Aspects of Animal Movement.** Papers from a symposium, Reading, England, Dec. 1978. H. Y. ELDER and E. R. TRUEMAN, Eds. Cambridge University Press, New York, 1980. x, 250 pp., illus. Cloth, \$44.50; paper, \$16.50. Society for Experimental Biology Seminar Series.

In the old days, most locomotion research was done by biologists who got the physics they needed either from childhood memories or from an hour with a colleague in a nearby department of mathematics, physics, or engineering. With a little effort, they could understand all the papers published on animal locomotion. Things are different now. Mathematicians and engineers are actually involved in the research, working with the biologists in their laboratories or in departments of applied mathematics or engineering. Communication between the biological and mathematical ends of the spectrum is difficult; to produce any satisfactory book with "animal locomotion" in its title has become a daunting task. The present editors started with a further disadvantage: the claim made for the volumes of the Society for Experimental Biology Seminar Series, as stated in the jacket blurb, that "together the contributions form introductory texts for the senior undergraduate, graduate student and research worker looking at the field for the first time." The editors have wisely ignored this, judiciously including the word "aspects" in their title and acknowledging in their preface that the treatment leaves gaps. In short, the book is not, and never could be, a textbook; it is no rival to Alexander and Goldspink's *Mechanics and Energetics of Animal Locomotion* (an excellent modern text) and Gray's *Animal Locomotion* (a good summary from the point of view of the old days).

How, then, are we to regard this book? I see each of its chapters as an essay reflecting the interests, approach, and idiosyncrasies of its author. One chapter is an original contribution in the style of a research paper, asking penetrating questions about locomotor efficiency (Taylor). Several are comprehen-

sive reviews of relatively small and self-contained sections of the subject, such as structural considerations (Currey), water-beetle swimming (Nachtigall), insect jumping (Bennet-Clark), vorticity and flight (Rayner), and walking (Alexander). Other authors attempt to review much wider fields and have to spread their material correspondingly thinly. One chapter, regrettably, seems to have been assembled with scissors and paste out of two of its author's chapters in another book. Some chapters assume familiarity with much of the animal kingdom; others presuppose confidence (or at any rate, no terror) in the presence of mathematics and fluid dynamics.

Anyone claiming an interest in the whole field of animal locomotion (if there be any such persons nowadays) will need this book. Those with narrower interests may read one or two chapters but would do well to read more; they cannot fail to be fascinated and to learn something worthwhile. Certainly it will do a research worker of the mathematical sort good to read the chapters that have no equations in them. The classical biologist, more at home with description than algebra, should, however, beware when seeking to understand the more quantitative chapters: poor typesetting and proofreading, especially of mathematical material, have laid many traps for such a reader. That the highest density of infelicities, errors, and misprints is in a chapter by an author whose mother tongue is not English must lay much of the blame on the editors. Indeed, one wishes that the editors had ruled their contributors, however eminent, with a rather heavier hand; the inconsistency of symbols, units, and even spelling between chapters is disconcerting.

Every serious reader will come to regard three or four of the chapters as the most worthwhile, for a host of subjective reasons. My nomination goes to Currey's "Skeletal factors in locomotion," a lucid and readable review of natural engineering; Rayner's "Vorticity and animal flight," the first readily comprehensible review of this new approach, which was originated by Cone in 1968 but has been highly developed recently and almost independently by C. P. Ellington and Rayner himself; and finally Bennet-Clark's "Aerodynamics of insect jumping," based on experiments that were simple and elegant in conception and obviously fun to do.

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## Books Received

**Ab Initio Calculations.** Methods and Applications in Chemistry. Petr Carsky and Miroslav Urban. Springer-Verlag, New York, 1980. vi, 248 pp. Paper, \$21. Lecture Notes in Chemistry, vol. 16.

**Abstract Software Specifications.** D. Björner, Ed. Springer-Verlag, New York, 1980. xiv, 568 pp. Paper, \$31. Lecture Notes in Computer Science, vol. 86.

**Adsorption and Ion Exchange with Synthetic Zeolites.** Principles and Practice. William H. Flank, Ed. American Chemical Society, Washington, D.C., 1980. x, 294 pp., illus. \$34.25. ACS Symposium Series, 135.

**Advances in Biochemical Engineering.** Vol. 16. A. Fiechter, Ed. Springer-Verlag, New York, 1980. x, 148 pp., illus. \$42.60.

**Advances in Environmental Science and Engineering.** Vol. 3. James R. Pfafflin and Edward N. Ziegler, Eds. Gordon and Breach, New York, 1980. xiv, 224 pp., illus. \$59.

**Advances in Heterocyclic Chemistry.** Vol. 26. A. R. Katritzky and A. J. Boulton, Eds. Academic Press, New York, 1980. x, 248 pp., illus. \$32.

**Aging—Its Chemistry.** Albert A. Dietz and Virginia S. Marum, Eds. American Association for Clinical Chemistry, Washington, D.C., 1980. xxviii, 448 pp., illus. \$33.45.

**Alchemy.** The Philosopher's Stone. Allison Couderd. Shambhala, Boulder, Colo., 1980 (distributor, Random, New York). 240 pp., illus. Cloth, \$17.50; paper, \$8.95.

**Alcoholic Korsakoff's Syndrome.** An Information-Processing Approach to Amnesia. Nelson Butters and Laird S. Cermak. Academic Press, New York, 1980. xvi, 188 pp., illus. \$16.50.

**Algebras in Genetics.** Angelika Wörz-Busekros. Springer-Verlag, New York, 1980. vi, 238 pp. Paper, \$16. Lecture Notes in Biomathematics, vol. 36.

**Algorithms for Network Programming.** Jeff L. Kennington and Richard V. Helgason. Wiley-Interscience, New York, 1980. xvi, 292 pp., illus. \$23.50.

**Aminocyclitol Antibiotics.** Kenneth L. Rinehart, Jr., and Tetsuo Suami, Eds. American Chemical Society, Washington, D.C., 1980. x, 438 pp., illus. \$39.50. ACS Symposium Series, 125.

**Analysis of Airborne Pollutants in Working Atmospheres.** The Welding and Surface Coatings Industries. Janet Moreton and N. A. R. Falla. The Chemical Society, London, 1980. viii, 184 pp., illus. \$32.

**Ancient Lamps in the Royal Ontario Museum. I: Greek and Roman Clay Lamps.** A Catalogue. J. W. Hayes. Photographs by W. B. Robertson and others. Royal Ontario Museum, Toronto, 1980. xiv, 226 pp. \$22.50.

**Annual Review of Sociology.** Vol. 6. Alex Inkeles, Neil J. Smelser, and Ralph H. Turner, Eds. Annual Reviews, Palo Alto, Calif., 1980. viii, 514 pp. \$20.

**Antibiotics and Chemotherapy.** Current Topics. R. N. Gruneberg, Ed. University Park Press, Baltimore, 1980. xii, 220 pp., illus. \$27.50. Current Status of Modern Therapy, vol. 4.

**Antidiuretic Hormone.** Vol. 4. Mary L. Forsling. Eden Press, St. Albans, Vt., 1980 (distributor, Pergamon, New York). viii, 166 pp. \$26. Annual Research Reviews.

**Aquarium Fishes.** Dick Mills. Arco, New York, 1980. 126 pp., illus. \$7.95.

**Arabia, the Gulf and the West.** J. B. Kelly. Basic Books, New York, 1980. x, 530 pp. \$25.

**Archaeological Explorations in Caves of the Point of Pines Region, Arizona.** James C. Gifford. University of Arizona Press, Tucson, 1980. xiv, 218 pp., illus. Paper, \$8.95. Anthropological Papers of the University of Arizona, No. 36.

**Assessment and Modification of Emotional Behavior.** Proceedings of a symposium, Mississauga, Canada, Apr. 1978. Kirk R. Blankstein, Patricia Pliner, and Janet Polivy, Eds. Plenum, New York, 1980. x, 226 pp. \$25. Advances in the Study of Communication and Affect, vol. 6.

**Astrophysics from Spacelab.** Pier Luigi Bernacca and Remo Ruffini, Eds. Reidel, Boston, 1980 (distributor, Kluwer Boston, Hingham, Mass.). xii, 664 pp., illus. \$47.50. Astrophysics and Space Science Library, vol. 81.

**Atom's Eve.** Ending the Nuclear Age. An Anthology. Mark Reader, Ronald A. Hardert, and Gerald L. Moulton, Eds. McGraw-Hill, New York, 1980. xii, 286 pp. Paper, \$5.95.

**Basic Concepts in Quantum Mechanics.** L. V. Tarasov. Translated from the Russian edition (1978) by Ram S. Wadhwa. Mir, Moscow, 1980 (U.S. distributor, Imported Publications, Chicago). 264 pp., illus. \$8.

**The Beginnings of Solid State Physics.** Royal Society, London, 1980. iv, 178 pp. £10.25. First published in *Proceedings of the Royal Society of London*, series A, vol. 371, No. 1744.

**Benefit-Cost Analysis of Data Used to Allocate**