Essays on community organization and structure represent the greatest range of approaches and perspectives. Examples of this range are seen in the essays of Hiscock and Sebens, both of whom describe the ecology of sublittoral communities. Hiscock, however, presents qualitative species lists for regions in the eastern North Atlantic whereas Sebens presents quantitative process-oriented data (that is, data on biological interactions and physical factors) to explain the structure of communities in the western North Atlantic. My bias is that community organization is best understood by examining its structuring processes rather than by quantitative recording of the species composition as called for by Hiscock. Obviously there is no best way to describe community structure.

Scaling in space and time affects what is observed and skews impressions of what is important. A few essays (Lundälv's, for example) reveal the importance of a temporal perspective to discern population fluctuations. Connell suggests that temporal variability and persistence of species should be measured relative to the turnover of the species. Size and spatial scaling of interacting organisms are evident in several essays. Two ends of the size spectrum are represented in essays by Hicks and Sebens. Hicks's excellent review of phytal meiofauna covers the largely unseen world of microcrustaceans and their microalgal food and habitats. He also reviews patterns in their distribution, taxonomy, morphology, and biochemistry. He presents a clear picture of the functional morphology of interacting components as an explanation for widespread convergence among phytal meiofauna. Larger-scale and more apparent interactions were studied by Sebens. His essay integrates long-term quantitative data on patterns, processes, and mechanisms structuring benthic communities. His research indicated that complex interactions of competition, predation, recruitment, and water movement are important to the structure (abundance, dominance, and persistence) of subtidal rock-dwelling communities in the Gulf of Maine. He concluded that many larger-scale patterns are mediated by interactions that occur on small spatial scales. Thus all scales are important.

Several contributors present logical-sounding stories based on considerable quantities of first-hand data with explanations that fit observed patterns. Disturbingly few essays, however, are based on experiments. Throughout the volume, authors indicate the need for experiments to resolve alternative hypotheses. Underwood considers experimentation in ecological studies and warns that care must be taken in the formulation and testing of hypotheses. He shows with several examples from his research that narrowly conceived experimental studies could create erroneous conclusions if simultaneous interactions between biological and physical factors are ignored. His points are well taken, and this chapter should be required reading for all researchers and students in ecology.

In sum the volume provides an interesting mix of approaches, perspectives, and philosophies. Despite this diversity, several topics of current interest are absent or underrepresented. For example, clonal and colonial organisms are largely ignored. Reproductive strategies or variations and persistence of species using turnover (as discussed by Todd and Connell, respectively) should be considered for organisms with no known senescence. Relatively little is presented on the demography, reproduction, and recruitment of sessile organisms (particularly algae). The volume would have been better balanced had there been fewer essays on the population biology of inconspicuous gastropods and at least one on competition. Thus, it appears that 20 years after Lewis's original work the rocky shores are worth revisiting but far from being understood.

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Some Other Books of Interest

Mathematical Physics. ROBERT GEROCH. University of Chicago Press, Chicago, IL, 1985. vi, 351 pp., illus. $30; paper, $15. Chicago Lectures in Physics.

Though "it is often the case that the essential physical ideas of a discussion are smothered by mathematics through excessive definitions, concern over irrelevant generality," and the like, writes Geroch, one can nonetheless "make a case that mathematics as mathematics, if used thoughtfully, is almost always useful—and occasionally essential—to progress in theoretical physics." The familiar role of mathematics in physics is "that of solving specific physical problems which have already been formulated mathematically," and this role has come to dominate in university curricula. The role Geroch sees for mathematics in physics is a "broad and largely shallow" one in which "the idea is to isolate mathematical structures, one at a time, to learn what they are and what they can do. Such a body of knowledge, once established, can then be called upon whenever it makes contact with the physics." The book is intended as "a brief walking tour through various areas of mathematics, providing, where appropriate and available, examples in which this mathematics provides a framework for the formulation of physical ideas." The book contains 56 chapters ranging in length from two to 13 pages. Twenty-three chapters "deal with things algebraic" and 17 "with things topological." Eight chapters discuss such "special topics" as structures that combine algebra and topology, Lebesgue integrals, and Hilbert spaces. "Lest the impression be left that no difficult mathematics can ever be useful in physics," five chapters deal with the spectral theorem. Geroch notes that although strictly speaking the only prerequisites are a little elementary set theory, algebra, and some elementary calculus, some informal contact with groups, vector spaces, and topological spaces "would be most helpful."—L.H.

Fundamental Neuroanatomy. WALLE J. H. NAUTA and MICHAEL FEIRTAG. Freeman, New York, 1986. xii, 340 pp., illus. $39.95; paper, $26.95.

This book is intended for "anyone seeking familiarity with the tissues inside the skull and at the center of the vertebral column," although the authors caution that it is "far from encyclopedic" in that it "slights the molecular basis of neural activity and the intricate local patterns in which nerve cells are organized." The book is divided into three parts. Part 1 is a set of preliminaries. It deals with early phylogeny, the nerve cell and the cells that support its activity, the anatomical divisions of the brain, and the techniques for tracing the connections a nerve cell makes with other nerve cells. Part 2 is a topological overview of the mammalian brain and spinal cord. In it the authors construct "a broad-scale mammalian wiring diagram." Part 3 is an account of the anatomy of the brain. It concludes with a chapter, entitled "Prospects," that discusses some issues having to do with understanding the brain. The book has a bibliography and a subject index.—L.H.

Motivational Systems. FREDERICK TOATES. Cambridge University Press, New York, 1986. xii, 188 pp., illus. $37.50; paper, $11.95. Problems in the Behavioural Sciences, 4.

Toates writes that in this book he has set himself "a tough task: to breathe some life into the theory of motivation." He considers "the divorce between motivation theory and learning theory to be to everyone's disadvantage," and in this book he hopes to bring together the traditional theoretical domain that looks at "the biological roots of motivation," the domain that considers "the purposive, goal-directed nature of motivational systems," and the domain of contemporary learning theory. In the book's nine chapters Toates discusses where drive and motivation constructs have been employed, models and theories of motivation, ingestive motivational systems and how they compare with non-ingestive motivational systems, associations and motivations, models of the environment in the spatial dimension, and the interaction between motivational systems. A final chapter is entitled "Conclusions and outlook." A list of close to 300 references and a subject index conclude the book.

—L.H.

Books Received

The Autoimmune Diseases. Noel R. Rose, Ed. Academic Press, Orlando, FL, 1985. xxxvi, 727 pp., illus. $85; paper, $49.95.

Biological and Inorganic Copper Chemistry. Kenneth D. Karlin and Jon Zubieta, Eds. Adenine, Guilderland, NY, 1986. Two volumes. Vol. 1, xii, 273 pp., illus. $65. Vol. 2, xii, 298 pp., illus. $65. From a conference, Albany, NY, July 1984.

The Biological Bases of Personality and Behavior. Vol. 1, Theories, Measurement Techniques, and Development. Jan Strelau, Frank H. Farley, and Anthony Gale, Eds. Hemisphere, New York, 1985. xvi, 259 pp., illus. $39.95. Series in Clinical and Community Psychology.

The Biological Bases of Personality and Behavior. Vol. 2, Psychophysiology, Performance, and Applications. Jan Strelau, Frank H. Farley, and Anthony Gale, Eds. Hemisphere, New York, 1986. xvi, 230 pp., illus. $39. Series in Clinical and Community Psychology.

Biological Effects and Dosimetry of Static and ELF Electromagnetic Fields. M. Grandolfo, S. M. Michaelson, and A. Rindi, Eds. Plenum, New York, 1985. xii, 697 pp., illus. $97.50. Ettore Majorana International Science Series, vol. 19. From a course, Erice, Italy, Nov. 1983.

Biological Museum Methods. Vol. 2, Plants, Invertebrates and Techniques. George Hangay and Michael Dingley. Academic Press, Orlando, FL, 1985. xvi, 323 pp., illus. $58.

Biological Response Modifiers. New Approaches to Disease Intervention. Paul F. Torrence, Ed. Academic Press, Orlando, FL, 1985. xviii, 397 pp., illus. $60; paper $39.95.

Biology. James M. Barrett *et al*. Prentice-Hall, Englewood Cliffs, NJ, 1986, xxvi, 1168 pp., illus. $35.95.

The Biophysical Basis of Excitability. Hugo Gil Ferreira and Michael W. Marshall. Cambridge University Press, New York, 1985. xxiv, 484 pp., illus. $80.

Computers and Communications. A Vision of C & C. Koji Kobayashi. MIT Press, Cambridge, MA, 1986. xviii, 190 pp., illus. $16.95. Translated from the Japanese edition (Tokyo, 1985).

The Concept of Physical Law. Norman Swartz. Cambridge University Press, New York, 1985. xii, 220 pp. $29.95.

The Connection Machine. W. Daniel Hillis. MIT Press, Cambridge, MA, 1986. xvi, 190 pp., illus. $22.50. MIT Press Series in Artificial Intelligence.

Conservation of Tidal Marshes. Franklin C. Daiber. Van Nostrand Reinhold, New York, 1986. x, 341 pp., illus. $39.95.

Constructive Quantum Field Theory. Selected Papers. James Glimm and Arthur Jaffe. Birkhäuser, Boston, 1985. x, 533 pp., illus. $74.95. Collected Papers, vol. 2.

Electrochemistry in Research and Development. R. Kalvoda and Roger Parsons, Ed. Plenum, New York, 1985. viii, 308 pp., illus. $55. From a meeting, Paris, June 1984.

Evolution. A Theory in Crisis. Michael Denton. Adler and Adler, Washington, DC, 1986. 368 pp., illus. $19.95.

Evolution and Creation. Ernan McMullin, Ed. University of Notre Dame Press, Notre Dame, IN, 1986. xvi, 307 pp. $24.95. University of Notre Dame Studies in the Philosophy of Religion, no. 4. From a conference, Notre Dame, March 1983.

Evolution as a Religion. Strange Hopes and Stranger Fears. Msary Midgley. Methuen, New York, 1985. x, 180 pp. $33; paper, $11.95.

Folk Medicine. The Art and the Science. Richard P. Steiner, Ed. American Chemical Society, Washington, DC, 1986. viii, 224 pp., illus. $22.95.

Forth. A Text and Reference. Mahlon G. Kelly and Nicholas Spies. Prentice-Hall, Englewood Cliffs, NJ, 1986. xxii, 487 pp. $24.95.

Glaciation in Alaska. The Geologic Record. Thomas D. Hamilton, Katherine M. Reed, and Robert M. Thorson, Eds. Alaska Geological Society, Anchorage, 1986. vi, 265 pp., illus. Paper, $18.

The Global Possible. Resources, Development, and the New Century. Robert Repetto, Ed. Yale University Press, New Haven, CT, 1986. xvi, 538 pp. $45; paper, $13.95. A World Resources Institute Book. Based on a conference, Wye Plantation, MD, May 1984.

Handbook of States of Consciousness. Benjamin B. Wolman and Montague Ullman, Eds. Van Nostrand Reinhold, New York, 1986. xii, 672 pp. $54.50.

Hardy Classes and Operator Theory. Marvin Rosenblum and James Rovnyak. Oxford University Press, New York, 1985. xiv, 161 pp. $39.95. Oxford Mathematical Monographs.

The Heavy Metal-Tolerant Flora of Southcentral Africa. A Multidisciplinary Approach. R. R. Brooks and F. Malaisse. With a chapter by A. Empain. Balkema, Accord, MA, 1985. x, 199 pp., illus. $35.

Large Scale Water Transfers. Emerging Environmental and Social Experiences. Genady N. Golubev and Asit K. Biswas, Eds. Published for the United Nations Environment Programme by Tycooly, Oxford, England, 1985. x, 158 pp., illus. $22.50; paper, $16.50.

Larval Growth. Adrian M. Wenner, Ed. Balkema, Accord, MA, 1985. xii, 236 pp., illus. $35. Crustacean Issues 2. From a symposium.

Laser Pioneer Interviews. High Tech Publications, Torrance, CA, 1985. x, 203 pp., illus. Paper, $17.95. Reprinted from *Lasers and Applications*.

Light by Einstein's Universe. The Role of Energy in Cosmology and Relativity. S. J. Prokhovnik, Reidel, Dordrecht, 1985 (U.S. distributor, Kluwer, Hingham, MA). xiv, 221 pp. $39. Fundamental Theories of Physics.

Los Linfocitos en la Enfermedad de Chagas. Estudios Sobre Alguons Aspectos de la Funcion Linfocitaria. Humberto R. A. Cabral. Universidad Nacional de Cordoba, Cordoba, Argentine, 1985. 205 pp., illus. Paper, $8.50.

Mental Images and Their Transformations. Rogen N. Shepard, Lynn A. Cooper, *et al*. MIT Press, Cambridge, MA, 1986. x, 364 pp., illus. Paper, $9.95. Reprint, 1982 edition.

The Microbial World. Roger Y. Stanier *et al*. 5th ed. Prentice-Hall, Englewood Cliffs, NJ, 1986. xiv, 689 pp., illus. $43.95.

Microelectronics Processing. Inorganic Materials Characterization. Lawrence A. Casper, Ed. American Chemical Society, Washington, DC, 1986. x, 444 pp., illus. $79.95. ACS Symposium Series, 295. Based on a symposium.

Migration of Seismic Data. Gerald H. F. Gardner, Ed. Society of Exploration Geophysicists, Tulsa, OK, 1985. viii, 462 pp., illus. Paper, $19. Geophysics Reprint Series, no. 4.

The Miocene Ocean. Paleoceanography and Biogeography. James P. Kennett, Ed. Geological Society of America, Boulder, CO, 1985. vi, 337 pp., illus., + microfiche cards and oversize insert. $42. Memoir 163.

Mixing of Liquids by Mechanical Agitation. Jaromir J. Ulbrecht and Gary K. Patterson, Eds. Gordon and Breach, New York, 1985. x, 345 pp., illus. $99. Chemical Engineering: Concepts and Reviews, vol. 1.

Modern Bioelectrochemistry. Felix Gutmann and Hendrik Keyzer, Eds. Plenum, New York, 1986. xxvi, 627 pp., illus. $89.50.

Modern Quaternary Research in Southeast Asia, Vol. 9. Gert-Jan Bartstra and Willem Arnold Casparie, Eds. Balkema, Accord, MA, 1985. viii, 157 pp., illus. $12.50. From a congress, Peñablanca, Phillipines, Jan. 1985.

Modern Signal Processing. Thomas Kailath, Ed. Hemisphere, Washington, DC, 1985. xviii, 445 pp., illus. $79.95; paper, $49.95. Proceedings of the Arab School on Science and Technology. From a school, Zabadani, Syria, Aug. 1983.

Nutrition and Feeding in Fish. C. B. Cowey, A. M. Mackie, and J. G. Bell, Eds. Academic Press, Orlando, FL, 1985. xiv, 489 pp., illus. $45.

Nutrition and Neurobiology. J. C. Somogyi and D. Hötzel, Eds. Karger, New York, 1986. viii, 224 pp., illus. $76.25. Bibliotheca Nutritio et Dieta, no. 38. From a symposium, Bonn, May 1985.

Optical Interferometry. P. Hariharan. Academic Press, Orlando, FL, 1985. xvi, 303 pp., illus. $58.

Options for the Control of Influenza. Alan P. Kendal and Peter A. Patriarca, Eds. Liss, New York, 1986. xxvi, 541 pp., illus. $85. UCLA Symposia on Molecular and Cellular Biology, vol. 36. From a symposium, Keystone, CO, April 1985.

The Origins of Logic. One to Two Years. Jonas Langer. Academic Press, Orlando, FL, 1986. xii, 415 pp. $75; paper, $36.95. Developmental Psychology Series.

The Peptides. Analysis, Synthesis, Biology. Sidney Udenfriend and Johannes Meienhofer, Eds. Vol. 7, Conformation in Biology and Drug Design. Victor J. Hruby, Ed. Academic Press, Orlando, FL, 1985. xx, 495 pp., illus. $99.

Phanerozoic Diversity Patterns. Profiles in Macroevolution. James W. Valentine, Ed. Princeton University Press, Princeton, NJ, and Pacific Division, American Association for the Advancement of Science, San Francisco, 1985. x, 442 pp., illus. Cloth, $50; paper, $15. Princeton Series in Geology and Paleontology. From a symposium, Santa Barbara, CA, June 1982.

Plankton Stratigraphy. Hans M. Bolli, John R. Saunders, and Katharina Perch-Nielsen, Eds. Cambridge University Press, New York. 1985. viii, 1032 pp., illus. $175. Cambridge Earth Science Series.

Planning and Popularizing Science and Technology in Developing Countries. M. Anandakrishnan, Ed. Published in cooperation with the United Nations by Tycooly, Oxford, England, 1985. x, 293 pp., illus. $32.50; paper, $20. Science and Technology for Development Series, vol. 4. From two symposiums, Shuwaikh, Kuwait, Jan. 1983, and Tunis, Tunisia, April 1983.

Plant Community Ecology. Papers in Honor of Robert H. Whittaker. R. K. Peet, Ed. Junk, Dordrecht, 1985 (U.S. distributor, Kluwer, Hingham, MA). Advances in Vegetation Science, 7. Reprinted from *Vegetatio*.

Proceedings of the Fourth British National Conference on Databases. (Keele, July 1985.) A. F. Grundy, Ed. Cambridge University Press, New York, 1985. x, 229 pp., illus. $44.50. British Computer Society Workshop Series.

Program Evolution. Processes of Software Change. M. M. Lehman and L. A. Belady, Eds. Academic Press, Orlando, FL 1985. xiv, 539 pp., illus. $40; paper, $35. A.P.I.C. Studies in Data Processing, vol. 27.

Photonics. The New Science of Light. Valerie Burkig. Drawings by Mike Murphy. Enslow, Hillsdale, NJ, 1986. 128 pp., illus. $11.95.

Das Phylogenetische System der Plathelminthes. Ulrich Ehlers. Fischer, Stuttgart, 1985. 317 pp., illus. DM98.

Physical Methods for Inorganic Biochemistry. John R. Wright *et al*. Plenum, New York, 1986. xvi, 384 pp., illus. $59.50. Biochemistry of the Elements, vol. 5.

The Physical Universe. Konrad B. Krauskopf and Arthur Beiser. 5th ed. McGraw-Hill, New York, 1986. xxii, 760 pp., illus., + plates. $35.95.

Physics of the Sun. Peter A. Sturrock *et al*., Eds. Reidel, Boston, 1986 (distributor, Kluwer, Hingham, MA). Three volumes. Vol. 1, The Solar Interior. x, 257 pp., illus. $44.50. Vol. 2, The Solar Atmosphere. xii, 385 pp., illus. $62. Vol. 3, Astrophysics and Solar-Terrestrial Relations. xii, 287 pp., illus. $49. The set, $125. Geophysics and Astrophysics Monographs.

Processes and Resources of the Bering Sea Shelf (PROBES). D. W. Hood, Ed. Pergamon, New York, 1986. iv, 294 pp., illus. Paper, $44. *Continental Shelf Research*, vol. 5, nos. 1/2.

Productive Roles in an Older Society. Committee on an Aging Society, Institute of Medicine and National Research Council. National Academy Press, Washington, DC, 1986. x, 154 pp., illus. Paper, $16.95. America's Aging.

Properties and Interactions of Interplanetary Dust. R. H. Giese and P. Lamy, Eds. Reidel, Dordrecht, 1985 (U.S. distributor, Kluwer, Hingham, MA). xxvi, 444 pp., illus. $64. Astrophysics and Space Science Library, vol. 119. From a colloquium, Marseille, July 1984.

Psychology. David G. Myers. Worth, New York, 1986. xx, 693 pp., illus. $29.95.

The Psychology of Eating and Drinking. A. W. Logue. Freeman, New York, 1986. xiv, 298 pp., illus. $24.95; paper, $14.95. A Series of Books in Psychology.

Qualitative Choice Analysis. Theory, Econometrics, and an Application to Automobile Demand. Ken-

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