brachiopods, are addressing a broader array of questions and recognizing a greater diversity of phenomena as worthy of concerted study than in the previous few decades. Hoffman is skeptical of many of these new concepts and approaches. He is not ungenerous in acknowledging the salutary effect that the controversial ideas he ultimately rejects have had on the development of evolutionary paleobiology. But in the end he argues that most of the recent work has been erroneous or trivial, analytical or paleontological artifact, or simply reducible to the organismic level.

Hoffman offers a series of critiques, taking in turn punctuated equilibria, species selection, the periodicity and evolutionary role of mass extinctions, and global diversity patterns (he says little on evolutionary morphology or evolution and development, both active arenas of macroevolutionary research). I found much to disagree with here, but the discussion is stimulating and gracefully written and draws on a wide reading of the paleontological literature. A number of useful points are raised, for example in the attempts to define and classify the different workers' views of some of the most hotly debated concepts, such as macroevolution or punctuated equilibria. Hoffman is straightforward about his biases: in place of multiple working hypotheses posed at a variety of levels within the biological hierarchy, Hoffman presents "pragmatic reductionism" as an alternative to "falsificationism." In effect, a strictly microevolutionary approach, rejecting all hierarchical effects, is taken as the null hypothesis for any evolutionary phenomenon; this is a dangerous approach, given that few if any macroevolutionists would argue that microevolutionary processes are not operating simultaneously with macroevolutionary ones. Rigorously distinguishing among processes operating at different hierarchical levels can be fiendishly difficult and laborious, and Hoffman's advocacy of such a simple default procedure seems overly conservative (and not so different from the errors-by-default that he contends paleobiologists fall into when they use evolutionary stasis as a null hypothesis for patterns of morphological change in the fossil record). This is very much in contrast to the more pluralistic approach of such neo-Darwinians as John Maynard Smith, who draws a distinction between the role of higher-level processes in shaping complex adaptations such as the eye (trivial, Maynard Smith believes, relative to microevolutionary processes) and in determining the distribution of those adaptations in time and space (perhaps "of decisive importance"; see *Nature* **336**, 107 [1988]).

Finally, because this is a work of strong advocacy (or unabashed criticism, as Hoffman says in the introduction), it is not a substitute for the primary literature. New ideas are sharply criticized, but defenders of the faith suffer no such scrutiny. This unbalanced treatment hampers the usefulness of the book as an entry into the controversies and even yields internal contradictions. For example, Hoffman blithely accepts Smith and Patterson's critique of the paleontological data underlying Raup and Sepkoski's claim for periodic mass extinctions, but elsewhere advances arguments—including some from his own work—that incorporate the same alleged flaws (for example, use of paraphyletic taxa, which do not include all the descendants of a given ancestor and are thus arbitrary and illegitimate to a strict cladist). He also tends to omit rebuttals to the criticism he cites; for example, a number of the arguments cited against periodic extinction have been refuted (for a recent review and update, see Sepkoski, *J. Geol. Soc. London* **146**, no. 1, 7 [1989], which cites earlier papers). Similarly, Hoffman's claim that a neutral model can explain the history of global diversity is flawed by its failure to account for one of the most remarkable patterns in the fossil record: the 250-million-year plateau in the number of marine invertebrate families from the Late Ordovician to the Late Permian, maintained in the face of the waxing and waning of many groups and a series of mass extinctions. (It is also not clear whether a neutral model that has to be tuned by the addition of a Cambrian explosion and an end-Permian extinction is still simple or neutral.)

Overall this is a thought-provoking, if sometimes infuriating, volume. With its admittedly biased viewpoint, the book inevitably provides fuel and focus for debate (and, of course, for university seminars, if care is taken to offset its imbalances), but no resolution.

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Some Other Books of Interest

Star Catalogues. A Centennial Tribute to A. N. Vyssotsky. A. G. DAVIS PHILIP and ARTHUR R. UPGREN, Eds. Davis, Schenectady, NY, 1989. vi, 100 pp., illus. $20. Contributions of the Van Vleck Observatory, no. 8. From a meeting, Baltimore, MD, Aug. 1988.

In 1963 the Russian-born astronomer Alexander N. Vyssotsky, working at the University of Virginia, produced a catalog of stars, *Dwarf M Stars Found Spectrophotometrically*, comprising five lists that, in the words of Upgren, "together still form probably the purest and most complete magnitude-limited sample of unevolved stars of all possible ages within the Milky Way galaxy." The 1988 meeting of the International Astronomical Union Commission on photographic astrometry, of which this book is the proceedings, commemorated the centennial of Vyssotsky's birth. The book consists of a dozen papers reporting on current efforts in stellar cataloging. The first enterprise reported on is the *Third Catalogue of Nearby Stars* ("nearby" being defined as within 25 parsecs of the sun) being prepared at the Astronomisches Rechen-Institut in Heidelberg. Upgren and E. W. Weis then discuss uses of data on Vyssotsky stars, a complete catalog of which, with added data, is being prepared for publication. Other projects represented include the *Catalogue of Positions and Proper Motions* (a compilation of catalogs currently including over a million positions) of the Astronomisches Rechen-Institut, several efforts related to the European Space Agency's Hipparcos satellite, the *Second Cape Photographic Catalog* (with 5280 plates) of the Royal Greenwich Observatory, the *Astrographic Catalog* of the U.S. Naval Observatory, the *Catalog of the Components of Double and Multiple Stars* of the Observatoire Royal de Belgique, the new edition of the Yale *General Catalogue of Trigonometric Stellar Parallaxes*, and the *Guide Star Catalogue* to be used for pointing the Hubble Space Telescope.—**K.L.**

The Chemistry of α-Haloketones, α-Haloaldehydes and α-Haloimines. NORBERT DE KIMPE and ROLAND VERHÉ. Saul Patai and Zvi Rappoport, Eds. Wiley, New York, 1988. x, 496 pp., illus. $196. Updates from The Chemistry of Functional Groups.

The series The Chemistry of Functional Groups now contains over 30 volumes in many more parts, to which have been added some half-dozen "Supplements." The volume at hand introduces a new "offshoot of the main trunk." The aim of the "Updates" series is to "present selected chapters on a single topic or on closely related topics from the main series . . . in the form of more modestly sized and priced volumes," with appendixes to update the chapters and in some cases with treatments of new subjects. This volume draws on Supplement D (1983), *The Chemistry of Halides, Pseudo-Halides, and Azides* (priced at $917 but now out of print), reprinting chapters on the synthesis and reactivity of α-halogenated ketones and imines, with appendixes covering the literature up to the first half of 1986, and including a new chapter on α-haloge-

nated aldehydes and author and subject indexes. Among the topics planned for future Updates are nitrones, nitronates, and nitroxides; crown ethers; cyclopropyl radicals and ions; halogenation; synthesis of lactams and lactones; and synthetic applications of quinones.—**K.L.**

Atlas of Polymer Morphology. ARTHUR E. WOODWARD. Hanser, Munich, 1989 (U.S. distributor, Oxford University Press, New York). x, 531 pp., illus. $185.

This is essentially a book of pictures—optical and transmission and scanning electron micrographs—with a text that, as the author states at the outset, "has been written as an aid to understanding the photographs and is not a critical review of the material available" on its subject. The atlas proper is preceded by two short chapters giving an introduction to polymer science generally (including tables of crystal structure and repeat units and physical state) and the methodology of morphological study. The 442 micrographs that occupy the remainder of the volume are organized into 10 chapters, with introductions ranging in length from 3 to 13 pages. The first three chapters illustrate structures crystallized from solution, from the melt, and during polymerization. Block copolymers, liquid crystalline polymers, blends and composites, and effects of processing, mechanical deformation, fracture, and chemical and other agents are shown in the subsequent chapters. The book is printed on heavy, coated paper, averaging about three micrographs to a page with brief captions, including sources, on facing pages. Some 30 of the micrographs, mainly showing liquid crystalline phases, are in color. A subject index is included.—**K.L.**

Books Received

Advances in Cancer Control. Innovations and Research. Paul N. Anderson, Paul F. Engstrom, and Lee E. Mortenson, Eds. Liss, New York, 1989. xx, 407 pp. $84. Progress in Clinical and Biological Research, vol. 293. From a meeting, Washington, DC, March 1988.

Algebraic Homotopy. Hans Joachim Baues. Cambridge University Press, New York, 1989. xx, 466 pp., illus. $89.50.

Alpha and Omega. Ethics at the Frontiers of Life and Death. Ernlé W. D. Young. Addison-Wesley, Reading, MA, 1989. x, 209 pp. $19.95. A Portable Stanford Book.

Amorphous Silicon and Related Materials. Hellmut Fritsche, Ed. World Scientific, Teaneck, NJ, 1989. 2 vols. xxvi, 1123 pp., illus. $159. Advances in Disordered Semiconductors, vol. 1.

Antiterrorist Initiatives. John B. Wolf. Plenum. New York, 1989. xviii, 218 pp. $29.50. Criminal Justice and Public Safety.

Atlas Florae Europaeae. Distribution of Vascular Plants in Europe. Jaakko Jalas and Juha Suominen, Eds. Cambridge University Press, New York, 1989. 3 vols. Vol. 1, Pteridophyta and Gymnospermae. Variously paged. $59.50. Vol. 2, Salicaceae to Balanophoraceae, Polygonaceae, and Chenopodiaceae to Basellaceae. Variously paged. $69.50. Vol. 3, Caryophyllaceae. Variously paged. $89.50. Reprint, 1972–1986 eds.

Atlas of Uranus. Garry Hunt and Patrick Moore. Cambridge University Press, New York, 1989. 96 pp. $24.95.

Autotrophic Bacteria. Hans G. Schlegel and Botho Bowien, Eds. Science Tech, Madison, WI, 1989. xiv, 528 pp., illus. $85. Brock/Springer Series in Contemporary Bioscience. Based on a symposium, Göttingen, F.R.G., Aug. 1987.

Behavioral Teratogenesis and Behavioral Mutagenesis. A Primer in Abnormal Development. Ernest L. Abel. Plenum, New York, 1989. xii, 241 pp., illus. $29.50.

Biochemistry of Photosynthesis. R. P. F. Gregory. 3rd ed. Wiley-Interscience, New York, 1989. xxii, 257 pp., illus. $39.95.

Biological Delay Systems. Linear Stability Theory. N. MacDonald. Cambridge University Press, New York, 1989. xii, 235 pp., illus. $59.50. Cambridge Studies in Mathematical Biology, vol. 8.

Biological Principles with Human Applications. Gideon E. Nelson. 3rd ed. Wiley, New York, 1989. xii, 435 pp., illus. Paper, $34.50.

Blueprints. Solving the Mystery of Evolution. Maitland A. Edey and Donald C. Johanson. Little, Brown, Boston, 1989. xii, 418 pp., illus., + plates. $19.95.

Brain and Behavior. Jan Bureš, Olga Burešová, and Jiří Křivánek. Wiley, New York, 1988. 304 pp., illus. $64.95.

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Calculus with Applications. Claudia Dunham Taylor and Lawrence Gilligan. Brooks/Cole, Pacific Grove, CA, 1989. xvi, 700 pp., illus. $40.50.

Chemical Instrumentation. A Systematic Approach. Joward A. Strobel and William R. Heineman. 3rd ed. Wiley-Interscience, New York, 1989. xxvi, 1210 pp., illus. $49.95.

Chemical Kinetics and Dynamics. Jeffrey I. Steinfeld, Joseph S. Francisco, and William L. Hase. Prentice Hall, Englewood Cliffs, NJ, 1989. xii, 548 pp., illus. $35.

Chemistry and Computing. G. L. Breneman and O. J. Parker. Prentice Hall, Englewood Cliffs, NJ, 1989. x, 197 pp., illus. Paper, $15.

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Complex Information Processing. The Impact of Herbert A. Simon. David Klahr and Kenneth Kotovsky, Eds. Erlbaum, Hillsdale, NJ, 1989. xx, 459 pp., illus. $69.95; paper, $29.95.

Computers in Geography. David J. Maguire. Longman Scientific, Harlow, U.K., and Wiley, New York, 1989. xx, 248 pp., illus. Paper, $31.95.

Cosmic Rays. Michael W. Friedlander. Harvard University Press, Cambridge, MA, 1989. x, 160 pp., illus. $27.50.

A Course in Mathematics for Students of Physics. Vol. 1. Paul Bamberg and Shlomo Sternberg. Cambridge University Press, New York, 1988. xviii, 405 pp., illus. $49.50.

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