

prised and impressed by the detailed discussion of the biochemistry of *Flavobacterium thermophilum*, a bacterium with an optimum growth temperature of 85°C. Discussion of the amoeba-flagellate transformation and the peroxidase enzyme myeloperoxidase was also unexpected. Some unusual discussion more closely related to the general theme of the book includes a chapter by L. Pauling and E. Zuckerkandl on chance in evolution and chapters by C. Welch and A. Vegotsky dealing with the role of topics related to chemical evolution in high school and college courses. Although the majority of the contributions would be of more interest to the specialist, the general reader could get a perspective on the field by reading those in the section dealing with History and Scope. In particular there is a lucid discussion by R. Young of the philosophy and scientific goals of the NASA planetary biology program. The subsequent paper by N. Pirie dealing with the problems of recognizing life in places remote from the earth is especially pertinent to Young's discussion.

The first chapter of the book is a brief biography of S. W. Fox by the editors which reviews his contributions to prebiological chemistry from 1953 to the present. Fox has been influential since a number of his students and postdoctorals have continued to work in this area, and some of them have contributed chapters to this book. All these contributions demonstrate that Fox has earned the respect and admiration of those who have worked with him.

Fox has worked diligently to document and popularize his view of the origins of life. In brief he postulates that amino acids formed from the constituents of the earth's primitive atmosphere were thermally copolymerized in the dry state to a protein-like material he calls "proteinoid." He further postulates that the "proteinoids" were washed into an aqueous medium where under certain conditions they form organized units ("microspheres") which he believes exhibit some of the properties of cells. Thus he feels that protein was the basis for the origins of life and that nucleic acids came later as living systems became more complex. This view is outlined in greater detail by his son, J. L. Fox, in this volume and is discussed more fully by S. W. Fox and K. Dose in *Molecular Evolution and the Origins of Life* (Freeman, 1972).

S. W. Fox's view of chemical evolution is not universally accepted. I can recall that some of his students at Florida State University experienced difficulty with their Ph.D. committees because the faculty did not accept his theory and his approach to research. I suspect that this may be one of the reasons for D. Rohlfs' comment on the early research that "many hurdles—not all of them scientific—have been overcome in the course of this research." Obviously there will be no final answer as to which theory is the correct one for the origins of life. In an area rich in theory but poor in experimental fact one can only hope to gain perspective by sampling a number of views. The uninitiated would do well to at least contrast the ideas of S. W. Fox with those expressed by S. L. Miller and L. E. Orgel in *The Origins of Life on the Earth* (Prentice-Hall, 1973). Miller and Orgel argue, for example, that nucleic acids were essential for the origins of life.

In conclusion, this book provides some stimulating discussions of the origins-of-life question with much of the discourse centered around the approach pioneered by S. W. Fox. The specialist will probably want to obtain his own copy, but I suspect that a library copy will supply the needs of most others.

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## Books Received

**Abstracts of the Standard Edition of the Complete Psychological Works of Sigmund Freud.** Carrie Lee Rothgeb, Ed. Introduction by Robert R. Holt. Aronson, New York, 1974. vi, 316 pp. \$15.

**Acoustic Fields and Waves in Solids.** B. A. Auld. Wiley-Interscience, New York, 1973. Two volumes, illus. Vol. 1. viii, 424 pp. Vol. 2. viii, 414 pp. Each volume, \$24.95; the set, \$45.

**Advances in Clinical Chemistry.** Vol. 16. Oscar Bodansky and A. L. Latner, Eds. Academic Press, New York, 1973. x, 330 pp., illus. \$23.

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**Applications of Laser Raman Spectroscopy.** Stanley K. Freeman. Wiley-Interscience, New York, 1974. xiv, 336 pp., illus. \$17.50.

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D. Krahn, U. Scheffer, and G. Zech, Eds. Published for Astronomisches Rechen-Institut by Springer-Verlag, New York, 1973. x, 610 pp. \$32; by subscription, \$25.60.

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**A Basis for Linear Algebra.** Warren Brisley. Wiley, New York, 1973. viii, 190 pp., illus. \$12.95.

**Behavioral Regulators of Behavior in Primates.** Papers from two congresses, Tokyo, 1968, and Atlanta, Ga., 1968. C. R. Carpenter, Ed. Bucknell University Press, Lewisburg, Pa., 1974. 304 pp., illus. \$27.50. The Primates.

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**Chemical Technology.** An Encyclopedic Treatment. The Economic Application of Modern Technological Developments. Based upon a work originally devised by the late Dr. J. F. van Oss. Vol. 6, Wood, Paper, Textiles, Plastics and Photographic Materials. L. W. Codd and five others, Eds. Barnes and Noble, New York, 1974. xxiv, 686 pp., illus. \$42.50; by subscription, \$35.

**Compact City.** A Plan for a Liveable Urban Environment. George B. Dantzig and Thomas L. Saaty. Freeman, San Francisco, 1973. xii, 244 pp., illus. Cloth, \$9; paper, \$4.50.

**The Competent Infant.** Research and Commentary. L. Joseph Stone, Henrietta T. Smith, and Lois B. Murphy, Eds. Basic Books, New York, 1973. xxii, 1314 pp., illus. \$30.

**Computer-Aided Filter Design.** George Szentirmai, Ed. Institute of Electrical and Electronics Engineers, New York, 1973 (distributor, Wiley, New York). viii, 438 pp., illus. Cloth, \$12.95; paper, \$6.50. IEEE Press Selected Reprint Series.

**Computer Models of Thought and Language.** Roger C. Schank and Kenneth Mark Colby, Eds. Freeman, San Francisco, 1973. x, 454 pp., illus. \$13.50. A Series of Books in Psychology.

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(Continued on page 504)

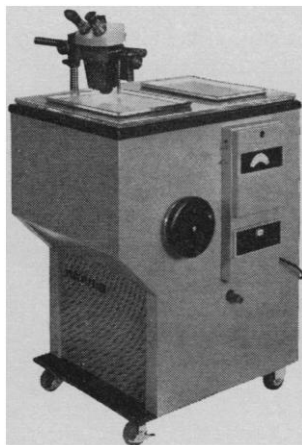
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**Drainage Basin Form and Process.** A Geomorphological Approach. K. J. Gregory and D. E. Walling. Halsted (Wiley), New York, 1974. x, 456 pp., illus. \$18.95.

**The Earth Environment.** John J. Fagan. Prentice-Hall, Englewood Cliffs, N.J., 1974. xii, 244 pp., illus. Paper, \$4.95.

**Electrodermal Activity in Psychological Research.** William F. Prokasy and David C. Raskin, Eds. Academic Press, New York, 1973. xii, 502 pp., illus. \$29.

**Electromagnetism.** F. N. H. Robinson. Clarendon (Oxford University Press), New York, 1973. x, 110 pp., illus. Paper, \$4.95. Oxford Physics Series.

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**Environment and Birth Defects.** James G. Wilson. Academic Press, New York, 1973. xiv, 306 pp., illus. \$19. Environmental Sciences Series.

**A Guide to Natural Cosmetics.** Connie Krochmal. Quadrangle, New York, 1973. x, 228 pp., illus. \$8.95.

**A Guide to the Medicinal Plants of the United States.** Arnold and Connie Krochmal. Quadrangle, New York, 1973. viii, 260 pp., illus. \$9.95.

**Human Behavior in the Social Environment.** A Social Systems Approach. Ralph E. Anderson and Irl E. Carter. Aldine, Chicago, 1974. viii, 184 pp., illus. \$8.50.

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**Implications of Continental Drift to the Earth Sciences.** Vol. 2. Proceedings of a symposium, Newcastle upon Tyne, England, April 1972. D. H. Tarling and S. K. Runcorn, Eds. Academic Press, New York, 1973. xvi, pp. 625-1184, illus. \$36.50.

**Initial Reports of the Deep Sea Drilling Project.** Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES). Vol. 15, Dec. 1970-Feb. 1971. Prepared for the National Science Foundation by the Scripps Institution of Oceanography, La Jolla, Calif., 1973. (available from the Superintendent of Documents, Washington, D.C.). xxii, 1138 pp., illus. + charts. \$17.65.

**Integrated Theory of Finite Element Methods.** John Robinson. Wiley-Interscience, New York, 1974. xxii, 428 pp., illus. \$29.50.

**Length of Stay in PAS Hospital, United States, 1972.** Commission on Professional and Hospital Activities, Ann Arbor, Mich., 1973. lxii, 190 pp., illus. Paper, \$8.50.

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**Madness and the Brain.** Solomon H. Snyder. McGraw-Hill, New York, 1974. x, 296 pp., illus. \$8.95.

**Le Malpas Rockshelter.** A Study of Late Paleolithic Technology in Its Environmental Setting. Anta Montet-White. Department of Anthropology, University of Kansas, Lawrence, 1973. viii, 136 pp., illus. Paper, \$3.40.

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**Stress Concentration Factors.** Charts and Relations Useful in Making Strength Calculations for Machine Parts and Structural Elements. R. E. Peterson. Wiley-Interscience, New York, 1974. xvi, 318 pp., illus. \$18.95.

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**Woody Plants of the North Central Plains.** H. A. Stephens. University Press of Kansas, Lawrence, 1973. xxx, 530 pp., illus. \$20.

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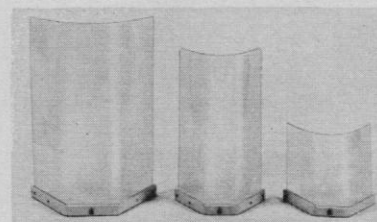


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