

Agassiz. The proceedings of a 1966 conference on environmental studies of the glacial Lake Agassiz region tied the biological story of lake basin history to the geological story. This new volume provides the Quaternary story as it was known in 1982. It is an excellent book that will stand as the definitive reference for the Quaternary of the heart of North America for many years.

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## Elements of an Orogen

**Regional Trends in the Geology of the Appalachian-Caledonian-Hercynian-Mauritanide Orogen.** PAUL E. SCHENK, R. T. HAWORTH, J. D. KEPPIE, W. E. TRZCIENSKI, P. F. WILLIAMS, and G. KELLING, Eds. Reidel, Boston, 1983 (distributor, Kluwer Boston, Hingham, Mass.). xiv, 398 pp., illus. \$53.50. NATO ASI Series C, vol. 116. From an institute, Fredericton, N.B., Canada, Aug. 1982.

This book is a collection of papers presented at a meeting of geologists many of whom have worked together on the International Geological Correlation Programme Project 27 to compile geologic data from the Appalachian (eastern North America), Caledonian (British Isles and Scandinavia), Hercynian (France, Spain, and Portugal), and Mauritanide (West Africa) orogens and to combine these data to obtain a better understanding of the orogen as a whole. The book is divided into six sections. The first five are summaries concerning geophysics, stratigraphy and sedimentology, volcanism and plutonism, metamorphism, and deformation. Included in the sixth are studies of mineralization and tectonics in the Canadian Appalachians.

Several thought-provoking interpretations are made from maps of geophysical data (section 1). For example, in the U.S. Appalachians two bands of gravity highs apparent on residual Bouguer maps for wavelengths shorter than 250 kilometers are interpreted by Kane to represent rifting environments, which is consistent with the presence of bimodal volcanic rocks reported by Fyffe *et al.* along the Blue Ridge and Green Mountains (section 3). In contrast to several papers published previously, both Roy *et al.* and Seguin and Fyffe conclude that paleomagnetic data do not support extensive left-lateral faulting within the northern Appalachians during Carboniferous time. From gravity and magnetic data Lefort *et al.* identify structures be-

neath the U.S. Atlantic Coastal Plain that they interpret to be the same as those in the Mauritanide orogen and propose that a prong of the African plate has been left behind. Schenk (section 2) interprets the Meguma terrane in Canada as part of that plate.

Poole *et al.* (section 2) give an excellent overview of the stratigraphy of the orogen. Tables, schematic maps, and text speak to the distribution of rock type in the geologic record. Other papers in section 2 provide more details of the stratigraphy of Scandinavia, Morocco, Nova Scotia, and Avalonian terranes. An interesting suggestion made by Kennan and Kennedy (section 6) is that cotecules (manganese garnet quartzites) may be used for long-range correlation.

Succinct summaries of igneous rock type, age, intrusive morphology, distribution, and inferred tectonic setting are presented for the Appalachians, the Caledonides, and France (section 3). However, the lack of maps and, in several papers, references is frustrating. Metamorphic rocks from these areas are discussed in terms of metamorphic facies, grade, facies series, and age (section 4). Small-scale maps are extremely informative; Robinson nicely distinguishes each metamorphic event in southern New England on separate maps. Fisher suggests that a metamorphic facies series is correlated with the composition of magma formed during the same "event" and supports this hypothesis with data from New England. Tables and maps are used effectively in section 5 to summarize deformation type, plutonism, metamorphism, isotopic data, and fossil occurrences in time and space. Osberg suggests that plutonism continued beyond deformation in the Appalachians.

The book is an important reference for anyone interested in the bedrock geology along the margin of the North Atlantic Ocean. Though it lacks an integrated overview of the orogen as a whole, it does, as is stated by Schenk, emphasize the importance of a multidisciplinary study. It is the only reference I know of that brings together summaries of so many aspects of the geology of the orogen. Most of the papers are well referenced for those wishing to delve into further details. The authors are well versed in the subjects they address, and the data compilations they present will save the reader countless time wading through the literature.

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## Books Received

**The Applications of Computers to Research on Nucleic Acids II.** D. Söll and R. J. Roberts, Eds. IRL Press, Washington, D.C., 1984. Two volumes. xvi, 856 pp., illus. Paper, \$60. Originally published as *Nucleic Acids Research*, vol. 12, No. 1.

**Aquametry.** A Treatise on Methods for the Determination of Water. Part 2, Electrical and Electronic Methods. Donald Milton Smith and John Mitchell, Jr. 2nd ed. Wiley-Interscience, New York, 1984. xiv, 1352 pp., illus. \$165. Chemical Analysis, vol. 5.

**Aquatic Toxicology.** Vol. 2. Lavern J. Weber, Ed. Raven, New York, 1984. x, 230 pp., illus. \$42.

**Aspects of Vagueness.** Heinz J. Skala, S. Termini, and E. Trillas, Eds. Reidel, Boston, 1984 (distributor, Kluwer Boston, Hingham, Mass.). viii, 304 pp., illus. \$39.50. Theory and Decision Library, vol. 39. From a conference, Canary Islands, June 1982.

**Atlas for Marine Policy in Southeast Asian Seas.** Joseph R. Morgan and Mark J. Valencia, Eds. University of California Press, Berkeley, 1984. 144 pp. \$125.

**Atlas of the Ocular Fundus.** H. Sautter *et al.* 3rd ed. Urban & Schwarzenberg, Baltimore, 1984. viii, 188 pp. \$124.50. Translated from the German edition (Munich, 1984) by F. C. Blodi.

**Augustine's Laws and Major System Development Programs.** Norman R. Augustine. 2nd ed. American Institute of Aeronautics and Astronautics, New York, 1984. x, 242 pp., illus. \$19.97.

**The Aztecs.** Brian M. Fagan. Freeman, New York, 1984. xiv, 322 pp., illus. \$27.95; paper, \$14.95.

**Bacterial Infections of Humans.** Epidemiology and Control. Alfred S. Evans and Harry A. Feldman, Eds. Plenum, New York, 1984. xlii, 702 pp., illus. Paper, \$27.50. Reprint, 1982 edition.

**Bender Gestalt Screening for Brain Dysfunction.** Patricia Lacks. Wiley-Interscience, New York, 1984. xxii, 223 pp., illus. \$29.95. Wiley Series on Personality Processes.

**Biological Control of Pests by Mites.** Marjorie A. Hoy, Gary L. Cunningham, and Lloyd Knutson, Eds. University of California Division of Agriculture and Natural Resources, Berkeley, 1983. vi, 185 pp., illus. Paper, \$15. From a conference, Berkeley, April 1982.

**Biological Regulation and Development.** Vol. 3B, Hormone Action. Robert F. Goldberger and Keith R. Yamamoto, Eds. Plenum, New York, 1984. xiv, 312 pp., illus. \$42.50.

**The Biology and Evolution of Language.** Philip Lieberman. Harvard University Press, Cambridge, Mass., 1984. xii, 379 pp., illus. \$27.50.

**Biotechnology.** A Textbook of Industrial Microbiology. Wulf Crueger and Anneliese Crueger. Thomas D. Brock, Ed. Sinauer, Sunderland, Mass., and Science Tech. Madison, Wis., 1984. xii, 308 pp., illus. \$28.95. Translated from the German edition (Wiesbaden, 1982).

**Brave New People.** Ethical Issues at the Commencement of Life. D. Gareth Jones. Inter-Varsity Press, Downers Grove, Ill., 1984. 221 pp. Paper, \$6.95.

**Cerebrovascular Disorders.** James F. Toole. 3rd ed. Raven, New York, 1984. x, 436 pp., illus. \$58.

**The Changing Definition of Masculinity.** Clyde W. Franklin, II. Plenum, New York, 1984. xii, 234 pp. \$29.50. Perspectives in Sexuality.

**Changing Metal Cycles and Human Health.** J. O. Nriagu, Ed. Springer-Verlag, New York, 1984. x, 446 pp., illus. \$21.50. Dahlem Workshop Reports. Life Sciences Research Report 28. From a workshop, Berlin, March 1983.

**Chemical Instabilities.** Applications in Chemistry, Engineering, Geology, and Materials Science. G. Nicolis and F. Baras, Eds. Reidel, Boston, 1984 (distributor, Kluwer Boston, Hingham, Mass.). xxvi, 420 pp., illus. \$58. NATO ASI Series, C, vol. 120. From a workshop, Austin, Tex., March 1983.

**Chemical Reactor Theory.** An Introduction. K. G. Denbigh and J. C. R. Turner. 3rd ed. Cambridge University Press, New York, 1984. x, 253 pp., illus. \$42.50; paper, \$14.95.

**Chemistry and Biology of  $\alpha_2$ -Macroglobulin.** Richard D. Feinman, Ed. New York Academy of Sciences, New York, 1983. x, 478 pp., illus. Paper, \$95. Annals of the New York Academy of Sciences, vol. 421. From a conference, New York, Jan. 1983.

**Chemistry and Ecotoxicology of Pollution.** Des W. Connell and Gregory J. Miller. Wiley-Interscience, New York, 1984. xiv, 444 pp., illus. \$40. Environmental Science and Technology.

**Chemistry Made Simple.** Fred C. Hess. Revised by Arthur L. Thomas. 2nd ed. Doubleday, Garden City, N.Y., 1984. xiv, 203 pp., illus. Paper, \$4.95. Made Simple Books.

**Chemistry of Particles, Fogs and Rain.** Jack L. Durham, Ed. Butterworths, Boston, 1984. xiv, 262 pp., illus. \$32.50. Acid Precipitation Series, vol. 2. An Ann Arbor Science Book. From a symposium, Las Vegas, March 1982.

**Chemotherapy of Gynecologic Cancer.** Gunter