

what it represents. It brings together many excellent results from the disciplines that contribute to paleohydrology. Among the topics addressed in the book's 21 chapters are climate change (Lockwood; Thornes); erosion and sedimentation (Walling and Webb); variations in discharge and reconstructions from sediment data (Maizels); the role of magnetic studies in paleohydrology (Oldfield); soils and hydrologic change (Hayward and Fenwick); archeology and alluvial stratigraphy (Limbrej); adjustments of lakes, flood-plains, arroyos, meanders, and river channels to runoff variations (Graf; Lewin; Rotnicki; Kozarski; Brown); ecological responses (Wiltshire and Moore); and the impact of large-scale floods on Mars as well as on Earth (Baker).

Knowledge of the occurrence, flux, and redistribution of water and sediment on Earth is based on engineering time-scale (less than 100 years) measurements and recordings. Some recorded hydrologic data extend back thousands of years in such centers of early civilizations as the Nile Valley and China; however, most of the water and sediment data used in planning, supply, and design throughout the world depend on a relatively short, recent period of direct measurements. Scientists and engineers use these short records, hoping that they are characteristic and representative of longer time series. Recent work indicates, however, that measurements made during short periods may not be representative of longer-term means and variances. The classic example is the division of water under the Colorado River Compact during the 1930's, wherein Colorado River water was allocated on the basis of stream-gaging data from 1896–1930. Long-term streamflow records reconstructed from tree-ring analysis indicate that the period 1907–1930, during which the Colorado River water pacts were completed, contained the longest series of high-flow years in the entire 450-year reconstructed record.

Knowledge of rates and processes well beyond a short time frame is desirable for most hydrologic works and essential for such projects as long-term disposal of radioactive waste. Additional methods for extending water and sediment records into the near future are needed, and paleohydrology is one promising approach.

The book does not cover such important topics as dendrohydrology and the use of paleohydrology in interpreting the rock record beyond the late Quaternary or give a synopsis of the pedigree of current paleohydrology practice (its ori-

gin is far earlier than 1954, a date that is implied in the introductory chapter).

The volume is not the last word on paleohydrology. A great deal of new work has become available since its publication. However, it admirably introduces the subject to a broad audience, and it lays a foundation for the burgeoning use of paleohydrology in many geologic investigations trying to interpret the history of Earth as well as for future hydrologic projects.

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Skin

Biochemistry and Physiology of the Skin. LOWELL A. GOLDSMITH, Ed. Oxford University Press, New York, 1983. In two volumes. xl, 1324 pp., illus. \$150.

There is a need for a textbook on skin that achieves a balance between discussions of applied, clinical data and expositions of the underlying basic scientific problems. Many editors state that their purpose is to produce such a book, but few succeed. The several dermatologic textbooks in print all emphasize clinical aspects; available symposium proceedings are narrowly focused or unbalanced and idiosyncratic. I fault the present volumes only to the extent that 99 percent of the organisms they deal with are mammals, including humans. However, in fairness to the contributing authors, any attempt to incorporate all available data on organisms other than mammals would have severely unbalanced many of the chapters.

Part 1 deals with structure. Odland covers the anatomy, histology, and ultrastructure of adult skin with his customary facility, and several other chapters offer additional anatomical details. Holbrook's exquisite electron micrographs do ample justice to the embryogenesis of the non-appendage-bearing skin, but more explicit indications of our ignorance concerning many aspects of appendages would have been appropriate. Similarly, Sengel brings recent advances in embryonic epithelial-mesenchymal interactions to a wide audience but says nothing concerning their continuing involvement in the maintenance of the adult state.

Parts 2 and 3 deal with the epidermis and dermis, covering all topics from the molecular level through dynamic controls of epidermal cell turnover; the chapter on wound healing is rather weak.

The chapters in part 4, on cutaneous appendages and nerves, are all very well done.

Volume 2 begins with part 5, Radiation and the Skin; its five chapters take one from the anatomical to the functional level with great skill and fluidity. Part 6 concerns principles of cutaneous pathophysiology and is organized into subdivisions on vascular and immune aspects, blistering, the nutritional bases of disease, and other pathogens. Briggaman's particularly informative discussion of the epidermal-dermal junction and the chapters on mammalian models for blistering (Lewis and Scott) and heritable diseases (Minor) support the editor's statement that pathology is dealt with only insofar as it spotlights basic scientific problems.

The chapters in parts 7 and 8 address cutaneous pharmacology and biophysical properties; once again the theoretical and experimental bases of fundamental problems predominate, especially in the chapter on percutaneous absorption by Scheuplein and Bronaugh.

Every chapter has an extensive bibliography, and there are many 1982 references. The 27-page index in volume 2 permits ready access to specific topics. There are many fine illustrations, and the electron micrographs are particularly noteworthy.

I anticipate frequent reference to these volumes in my own laboratory, and I recommend them to all who work on skin.

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Books Received

Annual Review of Ecology and Systematics. Vol. 14. Richard F. Johnston, Peter W. Frank, and Charles D. Michener, Eds. Annual Reviews, Palo Alto, Calif., 1983. xii, 503 pp., illus. \$27.

Annual Review of Energy. Vol. 8. Jack M. Hollander and Harvey Brooks, Eds. Annual Reviews, Palo Alto, Calif., 1983. x, 541 pp., illus. \$27.

Annual Review of Information Science and Technology. Vol. 18. Martha E. Williams, Ed. Published for American Society for Information Science by Knowledge Industry Publications, White Plains, N.Y., 1983. xiv, 447 pp. \$45.

Annual Review of Physical Chemistry. Vol. 34. B. Seymour Rabinovitch, J. Michael Schurr, and Herbert L. Strauss, Eds. Annual Reviews, Palo Alto, Calif., 1983. xviii, 669 pp., illus. \$28.

The Behavior of Human Infants. Alberto Oliverio and Michele Zappella, Eds. Plenum, New York, 1983. viii, 304 pp., illus. \$42.50. Ettore Majorana International Science Series (Life Sciences), vol. 13.

Benzodiazepines Divided. A Multidisciplinary Review. Michael R. Trimble, Ed. Wiley, New York, 1983. xiv, 329 pp., illus. \$39.95. From a symposium, London, 1982.

Clinical Electromyography. J. A. R. Lenman and A. E. Ritchie, 3rd ed. Pitman, London, 1983 (U.S. distributor, Urban & Schwarzenberg, Baltimore). xvi, 239 pp., illus. \$37.50.

Drilling Discharges in the Marine Environment. National Academy Press, Washington, D.C., 1983. xii, 180 pp. Paper, \$14.75.

(Continued on page 526)