of consumption changed. Consumer demand for more income-elastic products like meat, fruits, and vegetables rose more rapidly than the demand for grain. Changing demand patterns induced the shift in the composition of agricultural output from staples to nonstaples and also prompted the increased importance of livestock feed in current farm inputs.

As discussed in the papers on sectoral relationships, the nature of the interaction between agriculture and industry changed as agriculture moved from the first phase to the second. Throughout both phases the agricultural sector provided labor to industry, but only in the second phase did this lead to significant rural labor shortages and wage increases. During the first phase technological change was largely promoted by supply-side policies designed to create the agricultural surplus needed to support industrialization. By the second phase, however, the direction of agricultural development was increasingly led by demand. This transformation in the nature and direction of industrial-agricultural interactions constitutes an additional element of the agricultural transition.

Of the papers in this volume on Japan, Taiwan, and Korea, the set examining secular input-output trends is the most comprehensive and consistent. These papers trace out each country's agricultural development path and allow useful comparison among the countries. The papers on institutions, policies, and rural-urban interactions are more variable in quality and less comprehensive. Although individual papers stand on their own, as a group they do little to explain differences among countries in the timing and pace of agricultural development. Moreover, they do not provide an adequate basis for intercountry comparison of government policies toward agriculture or for comparison of the impact of those policies on agricultural development.

The six papers treating agricultural development in the PRC are diverse and, owing to the distinctive character of that country, not fully comparable with the others. This reviewer found Tang and Huang's analysis of input-output changes between 1952 and 1979, Lardy's examination of intersectoral resource flows, and Schran's analysis of recent changes associated with the four modernizations of particular interest.

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New World Cultures

Indians of the Upper Texas Coast. LAWRENCE E. ATEN. Academic Press, New York, 1983. xxiv, 370 pp., illus. $39.50. New World Archaeological Record.

The prehistoric and historic cultures of the upper Texas coast have the distinction of being among the least known from any region north of the Rio Grande. None of the natives of the area survived in a cultural sense into the 20th century, only a few of its acculturated 19th-century survivors related anything about themselves to anthropologists or others, and earlier accounts by shipwreck survivors (among them Cabeza de Vaca), Spanish missionaries, French traders, soldiers, and others are relatively scarce, fragmentary, and often of questionable reliability. Archeological investigations of the upper Texas coast were slow to get under way, and despite salvage programs and environmental assessment surveys that have accelerated the accumulation of data since the mid-1960's knowledge of its prehistory is poor.

Given such relatively meager data, it would seem unlikely that any scholar would have the audacity to undertake a "detailed synthesis of the region's culture history" (p. xvii). But the author of this book has done so, and the results are surprisingly informative and successful. His broad, holistic approach serves to alert archeologists of the benefits to be gained by overstepping disciplinary boundaries to utilize every scrap of relevant evidence. In this instance the discussion and explanation of "Late Quaternary environments" (chapter 8), and particularly of the terrace stratigraphy of the region, are particularly helpful, presenting information that is probably necessary to the understanding of its early cultures. Part 1, which consists of five chapters devoted to The Ethnohistoric Framework, is, though less successful, even more crucial in that it attempts to establish a cultural framework against or through which the prehistoric past may be viewed. Implicit, perhaps, in this emphasis is the recognition that too often areal syntheses have not made explicit, if in fact there was any awareness, that ethnographic models and assumptions were being employed.

Although generally a succinct and accurate summary of the historic natives of the upper Texas coast (the easternmost band of Karankawas and the Atakapan-speaking peoples—Akokisa, Bidai, Atakapa proper, and some minor "other groups"), part 1 contains some perplexing lapses and errors. Thus, the hypothesis that the Karankawas were Carib speakers who had colonized the Texas coast from the sea a generation or so before Europeans arrived is given far more credence than it deserves. Aten states that "no independent evidence is available at present to evaluate this possibility" (p. 29), despite archeological evidence that suggests that Karankawas were ancient inhabitants of coastal Texas. And, logically considered, the likelihood that Carib-speaking voyagers might forget and forgo their maritime culture in a few years to become littoral foragers (or *strandloopers*, the term Aten prefers, p. 11) is virtually nil.

Oddly too, Aten overlooks the significant fact that the poorly known Bidai, unlike other Atakapan speakers, raised substantial crops of corn. Apparently it is assumed that in terms of sociopolitical integration, population, and whatever archeological profile their ancestors might have left they did not differ significantly from other ethnic groups of the upper Texas coast. This seems unlikely. It would be more realistic to consider the Bidai, other than linguistically, to be an outlying or provincial group of the Hasinai Caddo, with whom, incidentally, they were sometimes aligned (or misaligned) by early observers.

Apart from its significance as the first sophisticated attempt to summarize the culture history of the upper Texas coast, this volume will likely become a model for those who aspire to create similar syntheses for other regions. This may be its major contribution.

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Paleohydrology

Background to Palaeohydrology. A Perspective. K. J. GREGORY, Ed. Wiley-Interscience, New York, 1983. xvi, 486 pp., illus. $57.

Paleohydrology is the study of the movements of water and sediment in various environments before the time of continuous hydrological records. Paleohydrology can encompass periods as short as decades or as long as millions of years. It is an interdisciplinary field based on geology, geomorphology, hydrology, sedimentology, ecology, and archeology.

This is an important book, not so much for the quality of its content as for

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 (Limbrey); 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 origin 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.

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