monsoons: the current view" is a fine amplification of Webster's account.

Two noteworthy chapters are contributed by M. S. Swaminathan, director of the International Rice Research Institute near Manila. He treats "abnormal monsoons" and their economic consequences in chapter 6; then, in the book's last chapter, he discusses monsoon disasters and what public actions to take. Too much monsoon can be as disastrous as the generally feared and more discussed monsoon failure, because of the rotting of crops in excessive water. On the effort to achieve stable agricultural production despite the vagaries of the monsoon, the Rice Research Institute and the "green revolution" have had some of their major impacts.

This reader started with "The Indian monsoon in literature" by K. Singh, a member of the Indian parliament. Singh first describes the premonsoon dryness after perhaps nine months without rain. The greatest heat comes in April and May, when everything is driest. Thus the transition to monsoon is especially impressive, and one speaks of the "burst of the monsoon." However, not everyone experiences the monsoon as a violent beginning. J. Nehru, for instance, wrote: "Like a thief in the night the monsoon had come to Bombay .... Another illusion gone" (p. 371).

"With the monsoon the tempo of life and death increases." The Indian attitude toward clouds and rain is conveyed in descriptions of the monsoon by India's classical and modern poets; the examples given range from verses written in Sanskrit between the 4th and 15th centuries A.D. to excerpts from an early-20th-century poem by R. Tagore. Singh maintains that to the people of India clouds are symbols of hope; to the Westerner, of despair. (We may wish to argue that point.) He concludes on a sad note: the advent since 1947 of technology for a stable water supply has reduced the intensity of emotion about the monsoon, thereby affecting its appeal for poets and novelists. "It remains the favorite time of year for lovers, but few now write about it."

In "The changing pulse of the monsoon" J. E. Kutzbach examines the geological record for evidence of monsoon fluctuations. Radiocarbon dating has revealed that the climate of India through the western Rajastan desert and beyond was humid during the interglacial period, roughly 5,000 to 12,000 years ago, compared to marked dryness during the last glacial epoch some thousands of years earlier. The entire long-term event might be related to the precession of the equinoxes, best described by F. Zimmermann in "Monsoon in traditional culture." The rate of precession is about 28 days in 2000 years, or not quite one astrological sign. This backward shift of the seasons must be taken into account in interpreting the many references to very old times, for instance in the dating of annual festivals described by B. J. Murton in "Monsoons in agricultural proverbs in Tamilnadu."

A part of the huge effect of the northern mountains described in "Orography and monsoons" by T. Murakami is the occurrence of a second precipitation season in the Himalayas and northern plains in winter. This results in the snow accumulations that H. F. Blanford used to predict summer monsoons in the earliest days of the Indian Meteorological Department (British weather service) in the 1870s and '80s (J. Shukla, "Long-range forecasting of monsoons").

P. K. Das, in "Short- and long-range monsoon prediction in India," gives average dates of onset and retreat (p. 553). In an otherwise complex chapter on monsoon models, T. Krishnamurti shows that a simple difference in sea-level pressure between Diego Suarez Island (in the western Indian Ocean, near Madagascar) and Bombay has been used to forecast onset dates. His monsoon rainfall chart (p. 494) shows that there is reason to be concerned about the annual total, since the averages shown are by no means high for a tropical continent. In former days, one might have asked: "Why not stabilize monsoon rains through weather modification?" It is of interest that this phrase does not appear in the index.

In summary, the reviewer feels that the initiative of editors Fein and Stephens has been successful and that their concept may well serve as a model for overviews of other subjects in science. The book can be recommended to the wide variety of potential readers to whom it is aimed. Even readers interested in only one aspect of the subject, such as the history of monsoon meteorology (treated in chapters by B. A. Warren and G. Kutzbach), may find that they have the urge to look around a bit more.

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Some Other Books of Interest

Essays on the History of Organic Chemistry. JAMES G. TRAYNHAM, Ed. Louisiana State University Press, Baton Rouge, LA, 1987. xii, 145 pp., illus. $25. Based on a symposium, Baton Rouge, 1984.

The 1984 session of the annual Louisiana State University Mardi Gras Symposium in Organic Chemistry had a historical theme, and this collection of eight papers (some of which have been published in other forms) is the result. The opening paper, "Convention versus ontology in nineteenth-century organic chemistry" by Alan J. Rocke, analyzes debates between theorists who "regarded the goal of theory as taxonomic convention" and those who "sought to approach the ultimate reality behind sensible appearances." The second paper, by John Wotiz and Susanna Rudofsky, deals with the purported dreamlike revelations experienced by Friedrich August Kekulé. There follow two papers on the development of stereochemistry by Stephen F. Mason and O. Bertrand Ramsey. In the next paper John A. Heitmann uses an account of sugar chemistry in Louisiana to shift attention from elite scientists to the "lower tiers" whose "application of organic chemistry to the solution of practical problems was in part responsible for the drive to industrial maturity that occurred in the United States between 1875 and 1914." In two further papers, Leon Gortler recounts the development of physical organic chemistry in the United States in the 1930s and '40s, with a focus on major institutions in the field and interconnections among their faculties, and James G. Traynham outlines the development of rules for chemical nomenclature. The final paper, a "compendium of chemical trivia" by Jack H. Stocker, includes among other items structural formulas for such compounds as *cis*-boom-bah and mercedes benzene, texts of chemical papers written in rhyme, and an abstract of a paper demonstrating that chicken plucking is of doubtful value as an index of tornado wind velocity.—K.L.

An International History of Mammalogy. KEIR B. STERLING, Ed. Vol. 1, Eastern Europe and Fennoscandia, 1. One World Press, Bel Air, MD, 1987. xxvi, 198 pp., illus. $25; paper, $20.

This volume is the first publication from a project that is expected to produce a total of 10 or 12 volumes over the next decade. The project, instigated by Keir B. Sterling, who serves as general editor, has an advisory board including members from Australia, Sweden, the United States, and the Soviet Union and has been endorsed by the (1978) International Theriological Congress and the Section on Mammalogy of the International Union of Biological Sciences. The volumes, whose chronological coverage is to be concentrated on modern times (specifically, starting with 1758, when the tenth edition of Linnaeus's *Systema Naturae* was published), are expected to provide "materials for a history of mammalogy rather than

an exhaustive survey." The present volume contains chapters on mammalogy in Finland (Ann Forstén *et al.*), Poland (Kazimierz Kowalski), Yugoslavia (Beatrica Đulic), Romania (Viorica Simionescu), and Bulgaria (Tsolo Peshev and Kliment Ohridsky). Each chapter gives a brief survey of important institutions, publications, and persons, relevant political events, and the current (up to about 1980) status of mammalogy. Work on fossils is included in the coverage. To all the chapters are appended lists of mammals currently recognized in the country discussed, bibliographies, and simple maps. The volume ends with an account by Gustav Kirk, president of the European Association for the Protection of Mammals, of threats to mammals and protection efforts in Eastern Europe. The projected next volumes are to deal with parts of Africa and the Americas.—K.L.

Advances in Nuclear Science and Technology. Vol. 19, Festschrift in Honor of Eugene P. Wigner. JEFFERY LEWINS and MARTIN BECKER, Eds. Plenum, New York, 1987. xx, 489 pp., illus. $85.

The present volume is dedicated to Eugene P. Wigner in recognition of his contributions to nuclear energy. The book opens with a "reminiscence" of Wigner by A. M. Weinberg, with particular attention to Wigner's work at the Metallurgical Laboratory at the University of Chicago and at the Clinton Laboratories in Oak Ridge between 1942 and 1947, years during which he "invented many of the techniques that we now teach in textbooks of reactor design." Mention is also made of Wigner's interest in energy problems and civil defense. Appended to the reminiscence are an annotated bibliography of Wigner's writings, including reports and memoranda as well as conventionally published items, and a list of the 39 patents he holds. The remainder of the volume consists of four "modern accounts of some of the developments initiated by Wigner": "The PIUS principle and the SECURE reactor concepts" by Kåre Hannerz (Sweden); "PRISM: an innovative inherently safe modular sodium cooled breeder reactor" by P. R. Pluta *et al.* (United States); "Generalized perturbation theory (GTP): a heuristic approach" by A. Gandini (Italy); and "Some recent developments in finite element methods for neutron transport theory" by R. T. Ackroyd *et al.* (United Kingdom).—K.L.

Books Received

Apples to Atoms. Portraits of Scientists from Newton to Rutherford. W. D. Hackmann. National Portrait Gallery, London, 1987 (U.S. distributor, Schram, Montclair, NJ). 88 pp. Paper, $19.50. Catalogue of an exhibition.

An Artifical Intelligence Approach to Test Generation. Naringer Singh. Kluwer, Norwell, MA, 1986. xiv, 193 pp., illus. $36.95. Kluwer International Series in Engineering and Computer Science.

Asymmetries in Time. Problems in the Philosophy of Science. Paul Horwich. MIT Press, Cambridge, MA, 1987. xvi, 218 pp. illus. $22.50; paper, $9.95.

Axonal Transport. Richard S. Smith and Mark A. Bisby, Eds. Liss, New York, 1987. xviii, 503 pp., illus. $78. Neurology and Neurobiology, vol. 25. From a symposium, Calgary, Alberta, July 1986.

The Aztec Templo Mayor. Elizabeth Hill Boone, Ed. Dumbarton Oaks Research Library and Collection, Washington, DC, 1987. 513 pp., illus. $40. From a symposium, Washington, DC, Oct. 1983.

Basic Complex Analysis. Jerrold E. Marsden and Michael J. Hoffman. 2nd ed. Freeman, New York, 1987. xiv, 604 pp., illus. $34.95.

The Beginning of the Age of Dinosaurs. Faunal Change Across the Triassic-Jurassic Boundary. Kevin Padian, Ed. Cambridge University Press, New York, 1987. xii, 378 pp., illus. $75. Based on a symposium, Berkeley, CA, Oct. 1984.

Better a Shield Than a Sword. Edward Teller. Perspectives on Defense and Technology. Free Press (Macmillan), New York, 1987. xiv, 257 pp. $19.95.

Biological Applications of Raman Spectroscopy. Thomas G. Spiro, Ed. Vol. 1, Raman Spectra and the Conformations of Biological Macromolecules. xvi, 352 pp., illus. $59.95. Vol. 2, Resonance Raman Spectra of Polyenes and Aromatics. xii, 376 pp., illus. $59.95. Wiley-Interscience, New York, 1987.

Biology. Neil A. Campbell. Benjamin/Cummings, Menlo Park, CA, 1987. xxxiv, 1101 pp. + appendixes, glossary, and index. $39.95. Benjamin/Cummings Series in the Life Sciences.

Capillary Liquid Chromatography. B. G. Belen'kii, E. S. Gankina, and V. G. Mal'tsev. Consultants Bureau (Plenum), New York, 1987. x, 252 pp., illus. $65. Macromolecular Compounds. Translated from the Russian by R. N. Hainsworth.

Chitin and Benzoylphenyl Ureas. James E. Wright and Arthur Retnakaran, Eds. Junk, Dordrecht, 1987 (U.S. distributor, Kluwer, Norwell, MA). x, 309 pp., illus. $86. Series Entomologica, vol. 38. From a symposium, Hamburg, F.R.G., Aug. 1984.

Cold Spring Harbor Symposia on Quantitative Biology. Vol. 51, Molecular Biology of *Homo sapiens*. Cold Spring Harbor Laboratory, Cold Spring Harbor, NY, 1987. Two volumes. xlii, 1229 pp., illus. $160; paper, $80. From a symposium, Cold Spring Harbor, June 1986.

Contributions of Technology to International Conflict Resolution. H. Chestnut, Ed. Published for the International Federation of Automatic Control by Pergamon, New York, 1987. xiv, 157 pp., illus. $50. From a workshop, Cleveland, OH, June 1986.

Controlled Release of Biologically Active Agents. Richard Baker. Wiley-Interscience, New York, 1987. xvi, 279 pp., illus. $59.95.

Cosmology. The Structure and Evolution of the Universe. G. Contopulos and D. Kotsakis. Springer-Verlag, New York, 1987. xiv, 235 pp., illus. Paper, $32.50. Translated from the second Greek edition (Athens, 1984) by M. Petrou and P. L. Palmer.

Critical Theories of Psychological Development. Jean M. Broughton, Ed. Plenum, New York, 1987. xxiv, 313 pp. $39.50. Publications for the Advancement of Theory and History in Psychology.

Developmental and Comparative Immunology. Edwin L. Cooper, Claude Langlet, and Jacques Bierne, Eds. Liss, New York, 1987. xxii, 180 pp., illus. $38. Progress in Clinical and Biological Research, vol. 233. From a congress, Reims, France, July 1985.

The Developmental Psychology of Music. David J. Hargreaves. Cambridge University Press, New York, 1987. x, 260 pp., illus. $39.50; paper, $14.95.

Diazo Compounds. Properties and Synthesis. Manfred Regitz and Gerhard Maas. Academic Press, Orlando, FL, 1986. xii, 596 pp., illus. $125.

Dictionary of Coal Science and Technology. Roy D. Merritt, Ed. Noyes, Park Ridge, NJ, 1987. vi, 384 pp., illus. $48.

Disease and Discovery. A History of the Johns Hopkins School of Hygiene and Public Health, 1916–1939. Elizabeth Fee. Johns Hopkins University Press, Baltimore, MD, 1987. xiv, 286 pp., illus. $30.

DNA Replication and Recombination. Roger McMacken and Thomas J. Kelly, Eds. Liss, New York, 1987. xxvi, 782 pp., illus. $140. UCLA Symposia on Molecular and Cellular Biology, new series, vol. 47.

Down to Earth. Foundations Past and Present. Jean Kerisel. Balkema, Accord, MA, 1987. x, 149 pp., illus. $29.50.

Encyclopedia of Artifical Intelligence. Stuart C. Shapiro, Ed. Wiley-Interscience, New York, 1987. Two volumes. xxiv, 1219 pp., illus. $149.95.

Engineering Aspects of Water Law. Leonard Rice and Michael D. White. Wiley-Interscience, New York, 1987. xii, 206 pp., illus. $39.95.

The Enzymes. Vol. 18, Control by Phosphotylation. Part B, Specific Enzymes (II); Biological Processes. Paul D. Boyer and Edwin G. Krebs, Eds. 3rd ed. Academic Press, Orlando, FL, 1987. xii, 512 pp., illus. $75.

Enzymology and Molecular Biology of Carbonyl Metabolism. Aldehyde Dehydrogenase, Aldo-Keto Reductase, and Alcohol Dehydrogenase. Henry Weiner and T. Geoffrey Flynn, Eds. Liss, New York, 1987. xviii, 447 pp., illus. $80. Progress in Clinical and Biological Research, vol. 232. From a workshop, Espoo, Finland, June 1986.

Epistemic Meaning. Monika Doherty. Springer-Verlag, New York, 1987. xii, 204 pp., illus. $65. Springer Series in Language and Communication, vol. 21. Translated and revised from the German edition (Berlin, 1985).

Die erfundene Wirklichkeit. Wie Wissen wir, was wir zu wissen glauben? Paul Watzlawick, Ed. Piper, Munich, 1986. 326 pp., illus. Paper, DM 14.80.

Essential Nutrients in Carcinogenesis. Lionel A. Poirier, Paul M. Newberne, and Michael W. Pariza, Eds. Plenum, New York, 1986. x, 562 pp., illus. $89.50. Advances in Experimental Medicine and Biology, vol. 206. From a symposium, Bethesda, MD, Feb. 1985.

Ethics, Science, and Democracy. The Philosophy of Abraham Edel. Irving Louis Horowitz and H. S. Thayer, Eds. Transaction Books, New Brunswick, NJ, 1987. viii, 318 pp. $49.95.

EURIT 86. Developments in Educational Software and Courseware. Jef Moonen and Tjeerd Plomp, Eds. Pergamon, New York, 1987. xxxvi, 726 pp., illus. $55. From a symposium, Enschede, the Netherlands, 1986.

Food Policy. Integrating Supply, Distribution, and Consumption. J. Price Gittinger, Joanne Leslie, and Caroline Hoisington, Eds. Published for the World Bank by Johns Hopkins University Press, Baltimore, MD, 1987. xiv, 567 pp., illus. Paper, $16.50. EDI Series in Economic Development.

The Forces Between Molecules. Maurice Rigby *et al.* Clarendon (Oxford University Press), New York, 1987. x, 232 pp., illus. $45; paper, $19.95.

Foundations of Cognitive Grammar. Vol. 1, Theoretical Prerequisites. Ronald W. Langacker. Stanford University Press, Stanford, CA, 1987. xii, 516 pp., illus. $42.50.

From Schema Theory to Language. Michael A. Arbib, E. Jeffrey Conklin, and Jane C. Hill. Oxford University Press, New York, 1987. x, 253 pp., illus. $39.95.

Frontiers of Physics. Samuel Gueller. Vantage, New York, 1987. 221 pp., illus. $16.95.

The Fulbright Experience, 1946–1986. Encounters and Transformations. Arthur Power Dudden and Russell R. Dynes, Eds. Transaction Books, New Brunswick, NJ, 1987. xiv, 314 pp. $29.95.

Herbals. Their Origin and Evolution. A Chapter in the History of Botany, 1470–1670. Agnes Arber. Cambridge University Press, New York, 1987. xxxii, 358 pp., illus. paper, $24.95. Cambridge Science Classics. Reprint, 1938 ed.

The Historical Development of Quantum Theory. Vol. 5, Erwin Schrödinger and the Rise of Wave Mechanics. Part 1, Schrödinger in Vienna and Zurich, 1887–1925. Jagdish Mehra and Helmut Rechenberg. Springer-Verlag, New York, 1987. xx, 366 pp. $54.

History of the Earth's Atmosphere. M. I. Budyko, A. B. Ronov, and A. L. Yanshin. Springer-Verlag, New York, 1987. viii, 139 pp., illus. Paper, $42. Translated from the Russian edition (Leningrad, 1985).

Homogenization Techniques for Composite Media. E. Sanchez-Palencia and A. Zaoui Eds. Springer-Verlag, New York, 1987. x, 397 pp., illus. $40.60. Lecture Notes in Physics, 272. From a course, Udine, Italy, July 1985.

Hormonal Proteins and Peptides. Vol. 13, Corticiotropin (ACTH). Academic Press, Orlando, FL, 1987. x, 202 pp., illus. $75.

Knowledge Representation in Medicine and Clinical Behavioural Science. Ladislav Kohout and Wyllis Bandler. Abacus, Cambridge, MA, 1986. x, 211 pp., illus. $35.

Laboratory Course Manual for Methods in Yeast Genetics. Fred Sherman, Gerald R. Fink, and James B. Hicks. Cold Spring Harbor Laboratory, Cold Spring Harbor, New York, 1986. 186 pp., illus. Paper, $25.