



Meanders of the East Fork of the Popo Agie River near Boulder, Wyoming. "The ubiquity of the meander pattern is typified by [this illustration]. The heterogeneous composition of bed particles leads to interaction among all sizes. As a result, the bed material does not lie uniformly distributed along a channel but bunches up in bars or riffles, which represent concentrations separated by pools or relative deficiencies in grains. These accumulations or channel bars tend to deflect the thread of flowing water toward a bank, with consequent erosion and initiation of a bend. Therefore, the shape, cross section, and flow within the channel take on the character of meanders. . . . Meanders represent a most probable configuration that is a compromise between minimum total work and uniform distribution of power expenditure." [From *A View of the River*]

pool-and-riffle sequence (noted above), the shapes of meander curves, the longitudinal profiles of rivers, the structure of drainage networks, and the hydraulic geometry of river channels.

*A View of the River* summarizes and updates many of the now-classical concepts that Leopold and his colleagues introduced into modern quantitative geomorphology. It provides lucid descriptions of the random-walk analog to channel network development and the entropy principle as applied to the minimum-variance statistical expression of channel forms. Leopold shows how field measurements led him to seek analogs from thermodynamics (the entropy principle) and the energy of machines (stream power) to explain river phenomena. Detailed calculations are employed not to impress the reader with their rigor but to illustrate important natural phenomena. Thus, flood routing illustrates channel dynamics, and channel geometry surveys illustrate the nature of bankfull discharge, the rate of flow when the water surface is at floodplain level.

One of Leopold's famous essays is entitled "A Reverence for Rivers." The motivation behind *A View of the River* seems to stem from this reverence. Leopold begins his preface with a sobering admonition: "We in the United States have acquiesced to the destruction and degradation of our rivers, in part because we have insufficient knowledge of the characteristics of rivers and the effects of our actions that alter their

form and process." It is a tragedy that some of this crime upon nature has been perpetrated by those who claim scientific principles as their foundation of thought. Such claimants may be well versed in the theoretical results of river science, but they can hardly be experienced in the investigation of real rivers. As Gilbert employed it, and as Leopold ably reasserts, investigation inevitably leads to a kind of reverence for object investigated. *A View of the River* is a book of science, but it is filled with such reverence.

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## Books Received

**The American Museum of Natural History's Book of Dinosaurs and Other Ancient Creatures.** Joseph Wallace. Simon and Schuster, New York, 1994. 144 pp., illus. \$25.

**Australian Vegetation.** 2nd ed. R. H. Groves, Ed. Cambridge University Press, New York, 1994. xviii, 562 pp., illus. \$79.95.

**Bacterial and Bacteriophage Genetics.** 3rd ed. Edward A. Birge. Springer-Verlag, New York, 1994. xvi, 454 pp., illus. \$49.50.

**Biology of  $\alpha^2$ -Macroglobulin, Its Receptor, and Related Proteins.** Wolfgang Borth *et al.*, Eds. New York Academy of Sciences, New York, 1994. xii, 521 pp., illus. Paper, \$140. Annals of the New York Academy of Sciences, vol. 737. From a conference, Woods Hole, MA, Oct. 1993.

**Chaos, Dynamics, and Fractals.** An Algorithmic Approach to Deterministic Chaos. Joseph L. McCauley. Cambridge University Press, New York, 1994. xxiv, 323 pp., illus. Paper, \$27.95. Cambridge Nonlinear Science Series, vol. 2. Reprint, 1993 ed.

**Chemical Reactor Development.** From Laboratory Synthesis to Industrial Production. Dirk Thoenes. Kluwer, Norwell, MA, 1994. xvi, 347 pp., illus. \$150 or £96 or Dfl. 240.

**Diagnostic Interviewing.** 2nd ed. Michel Hersen and Samuel M. Turner, Eds. Plenum, New York, 1994. xiv, 401 pp. \$47.50.

**Diagrammatics.** The Path to Feynman Rules. Martinus Veltman. Cambridge University Press, New York, 1994. xii, 284 pp., illus. Paper, \$29.95. Cambridge Lecture Notes in Physics, 4.

**Ethics and Environmental Policy.** Theory Meets Practice. Frederick Ferré and Peter Hartel, Eds. University of Georgia Press, Athens, 1994. xviii, 283 pp., illus. \$45; paper, \$20. From a conference, Athens, GA, April 1992.

**Experiments in Heat Transfer and Thermodynamics.** Robert A. Granger, Ed. Cambridge University Press, New York, 1994. xviii, 278 pp., illus. \$59.95; paper, \$24.95.

**Factors of Soil Formation.** A System of Quantitative Pedology. Hans Jenny. Dover, New York, 1994. xviii, 281 pp., illus. Paper, \$9.95. Reprint, 1941 ed.

**Foams.** Fundamentals and Applications in the Petroleum Industry. Laurier L. Schramm, Ed. American Chemical Society, Washington, DC, 1994. xiv, 555 pp., illus. \$109.95. Advances in Chemistry Series, 242.

**A Guide for Use in Planning, Conducting, and Reporting Research Projects.** 2nd ed. Paul Westmeyer. Thomas, Springfield, IL, 1994. xviii, 173 pp. \$41.95; paper, \$26.95.

**A Guide to Reproduction.** Social Issues and Human Concerns. Irina Pollard. Cambridge University Press, New York, 1994. xvi, 410 pp., illus. \$69.95; paper, \$24.95.

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**Haematological Oncology.** Vol. 3. James Armitage et al., Eds. Cambridge University Press, New York, 1994. x, 248 pp., illus. \$89.95. Cambridge Medical Reviews.

**Herbs of Choice.** The Therapeutic Use of Phytochemicals. Varro E. Tyler. Haworth, Binghamton, NY, 1994. xvi, 209 pp. \$24.95; paper, \$17.95.

**Into Africa.** Craig Packer. University of Chicago Press, Chicago, 1994. x, 283 pp., illus., + plates. \$24.95.

**An Introduction to Genetic Engineering.** Desmond S. T. Nicholl. Cambridge University Press, New York, and Institute of Biology, London, 1994. xiv, 168 pp., illus. \$39.95; paper, \$16.95. Studies in Biology.

**LIMS.** Implementation and Management. Allen S. Nakagawa. Royal Society of Chemistry, Letchworth, Herts, U.K., 1994 (U.S. distributor, CRC, Boca Raton, FL). xiv, 180 pp., illus. £37.50.

**Linear and Nonlinear Optical Properties of Molecules.** Georges H. Wagnière. Helvetica Chimica Acta, Basel, and VCH, New York, 1993. xii, 195 pp., illus. \$55.

**The Mathematical Theory of Dilute Gases.** Carlo Cercignani, Reinhard Illner, and Mario Pulvirenti. Springer-Verlag, New York, 1994. viii, 347 pp. \$49. Applied Mathematical Sciences, vol. 106.

**Nutrient Regulation During Pregnancy, Lactation, and Infant Growth.** Lindsay Allen, Janet King, and Bo Lönnardal, Eds. Plenum, New York, 1994. xiv, 294 pp., illus. \$79.50. Advances in Experimental Medicine and Biology, vol. 352. From a conference, Stockholm and Helsinki, Aug. 1992.

**The Observational Foundations of Physics.** Alan Cook. Cambridge University Press, New York, 1994. xii, 164 pp., illus. \$39.95; paper, \$18.95.

**PCR in situ Hybridization.** Protocols and Applications. 2nd ed. Gerard J. Nuovo. Raven, New York, 1994. xii, 449 pp., illus., + plates. \$80.

**Performance Evaluation of Parallel and Distributed Methods.** Solution Methods. O. J. Boxma and G. M. Koole, Eds. Centrum voor Wiskunde en Informatica, Amsterdam, 1994. Part 1, x pp. + pp. 1-155, illus. Part 2, x pp. + pp. 157-376, illus. Each vol., paper, Dfl. 50. CWI

Tracts 105 and 106. From a workshop, Turin, Italy, Sept. 1993.

**Rarefied Gas Dynamics.** 3 vols. Bernie D. Shizgal and Daniel P. Weaver, Eds. American Institute of Aeronautics and Astronautics, Washington, DC, 1994. Experimental Techniques and Physical Systems. xxvi, 633 pp., illus. Progress in Astronautics and Aeronautics, vol. 158. Space Science and Engineering. xxvi, 545 pp., illus. Progress in Astronautics and Aeronautics, vol. 160. Theory and Simulations. xxviii, 711 pp., illus. Progress in Astronautics and Aeronautics, vol. 159. Each vol., \$99.95. From a symposium, Vancouver, BC, July 1992.

**Reactivity in Molecular Crystals.** Yuji Ohashi, Ed. Kodansha, Tokyo, and VCH, New York, 1994. xii, 348 pp., illus. \$130.

**The Second Law.** P. W. Atkins. Freeman, New York, 1994. xii, 216 pp., illus. Paper, \$19.95. Scientific American Library. Reprint, 1984 ed.

**Sex in America.** A Definitive Survey. Robert T. Michael et al. Little Brown, New York, 1994. x, 300 pp., illus. \$22.95.

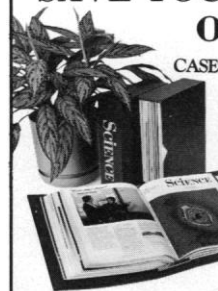
**Signal Coding and Processing.** 2nd ed. Graham Wade. Cambridge University Press, New York, 1994. xx, 436 pp., illus. \$79.95; paper, \$39.95.

**Symbiotic Nitrogen Fixation.** P. H. Graham, M. J. Sadowsky, and C. P. Vance, Eds. Kluwer, Norwell, MA, 1994. viii, 202 pp., illus. \$89 or £60 or Dfl. 150. Developments in Plant and Soil Sciences, vol. 57. From a conference, St. Paul, MN, July 1993. Reprinted from *Plant and Soil*, vol. 161, no. 1 (1994).

**Teleoperation and Robotics in Space.** Steven B. Skaar and Carl R. Ruoff, Eds. American Institute of Aeronautics and Astronautics, Washington, DC, 1994. xx, 502 pp., illus. \$99.95. Progress in Astronautics and Aeronautics, vol. 161.

**Tellurium-Containing Heterocycles.** Michael R. Detty and Marie B. O'Regan. Wiley, New York, 1994. xii, 511 pp., illus. \$125. The Chemistry of Heterocyclic Compounds, vol. 53.

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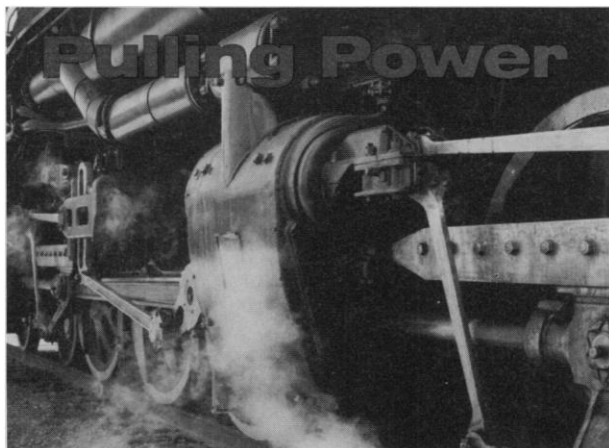
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