



"Portable telescope mounted on a lawnmower chassis. Photo courtesy of Dr. Clyde Tombaugh. Note the curved secondary mirror holder which minimizes the apparent effects of the diffraction spikes." [From *Unusual Telescopes*]

eyepiece extending inward through the open sunroof), to Sandia National Laboratories' array of solar sensors, which occasionally have been pointed at night toward bright celestial sources. In degree of seriousness, Manly's discussions range from an account of a telescope made from a beer can by David Levy (whose primary is a ladies' compact mirror and whose sighting device is the pull tab from the can) to an extended evaluation of the designs of solar telescopes on the summits of Mt. Wilson near Los Angeles, Kitt Peak in Arizona, and Sacramento Peak in New Mexico. The apertures of the telescopes he describes vary from a 1-inch, Schmidt-type telescope by Wesley Lindsay (a telescope without an eyepiece that is used as a finder for larger instruments) to the largest professional telescopes in the world. In time and space his coverage is also extensive and includes telescopes operating throughout the United States and Europe as well as in more remote locations such as Indonesia and Kenya. He treats quite a few historical designs as well, including the Paris Refractor of 1900, which was made for public viewing during the Paris Exhibition and dismantled shortly thereafter, and classics such as the 72-inch Leviathan telescope of Lord Rosse, made in the 1840s.

An amateur astronomer with professional affiliations, background in small computers, and publications in various magazines, Manly communicates a strong sense of familiarity and a firsthand appreciation of the telescopes he discusses. The book is also enhanced greatly by the large number of illustrations, more than 150 in all, picturing the majority of designs discussed. An index is included which, along with the list of illustrations, greatly assists in locating the information pertinent to a particular

telescope. Manly has grouped the telescopes rather loosely, using a prominent unusual feature, rather than size or application, as the focal point. The most attention naturally is paid to the optics and the mount, topics discussed in the first two chapters of the book. Subsequent chapters point out the mount and optics designs in relation to other features, including the position of the eyepiece and the mobility of the telescope.

This is not the book from which to learn about the principal types of telescope optical and mounting designs, however. Except in passing, or in rare exceptions (such as the schiefspiegler optical path and the Gregory-Maksutov double-field telescope), Manly does not detail or depict the specific principles that pertain to a particular mount or optical train. This is probably appropriate for an amateur audience, for which a knowledge of a Dobsonian mount may legitimately be presumed, but it does force the non-telescope-building audience to work a little harder. Largely beyond the scope of the book are aspects of telescope performance such as solid-state detectors, including CCDs, and the computerization of much astronomical data taking, data analysis, and scientific results, which are occasionally mentioned. While citations of the scientific astronomical literature are largely omitted, there are many references for further reading to the popular amateur journal *Sky and Telescope*, to several books describing the history of the telescope, and occasionally to engineering reports or publications.

With such a diversity of telescopes included, it is understandable that a few errors have crept into the text. For example, the Multiple Mirror Telescope at Mt. Hopkins, Arizona, which is operated jointly by the Smithsonian Institution and the University of Arizona, is mistakenly referred to and indexed as the Fred Lawrence Whipple Multiple Mirror Telescope. However, the author invites corrections, additions, and suggestions and provides an address (but not a telephone number until 1996, "when the youngest [teenager] will be away in school").

All in all, *Unusual Telescopes* provides interesting and often amusing descriptions of what makes some telescopes stand out from the rest. With an informal style and a wide familiarity with telescopes, Manly has written a book with an appeal not only to the principal audience of amateur observational astronomers but to a broader group of engineers and professional astronomers with an interest in system design or telescope performance.

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## Books Received

**Advances in Cryogenic Engineering.** Materials. Vol. 38, parts A and B. F. R. Fickett and R. P. Reed, Eds. Plenum, New York, 1992. xxvi, 1209 pp., illus. \$175. An International Cryogenic Materials Conference Publication. From a conference, Huntsville, AL, June 1991.

**Biology of Bacilli.** Applications to Industry. Roy H. Doi and Martina McGloughlin, Eds. Butterworth-Heinemann, Stoneham, MA, 1992. xiv, 370 pp., illus. \$79.95. Biotechnology Series, 22.

**The Cell Cycle.** Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY, 1992. xxxii, 782 pp., illus. \$210; paper, \$95. Cold Spring Harbor Symposia on Quantitative Biology, vol. 56. From a symposium, Cold Spring Harbor, NY, June 1991.

**Desire for Control.** Personality, Social, and Clinical Perspectives. Jerry M. Burger. Plenum, New York, 1992. xii, 196 pp. \$29.50. Plenum Series in Social/Clinical Psychology.

**Electrical Stimulation and Electropathology.** J. Patrick Reilly with contributions by Hermann Antoni *et al.* Cambridge University Press, New York, 1992. xviii, 504 pp., illus. \$74.95.

**A Field Guide to Eastern Butterflies.** Paul A. Opler. Illustrated by Vichai Malikul. Houghton Mifflin, Boston, MA, 1992. xx, 396 pp. + plates. \$24.95; paper, \$16.95. Peterson Field Guide Series, 4.

**Global Warming.** Physics and Facts. Barbara Goss Levi, David Hafemeister, and Richard Scribner, Eds. American Institute of Physics, New York, 1992. xvi, 310 pp., illus. \$95. AIP Conference Proceedings, 247. From a course, Washington, DC, April 1991.

**High-Energy Astrophysics.** American and Soviet Perspectives. Walter H. G. Lewin, George W. Clark, and Rashid A. Sunyaev, Eds. National Academy Press, Washington, DC, 1992. viii, 415 pp., illus. Paper, \$30. From a workshop, June 1989.

**Inorganic Biochemistry of Iron Metabolism.** Robert R. Crichton. Horwood (Prentice Hall), Englewood Cliffs, NJ, 1992. 263 pp., illus. \$75.95. Ellis Horwood Series in Inorganic Chemistry.

**Life Crises and Experiences of Loss in Adulthood.** Leo Montada, Sigrun-Heide Filipp, and Melvin J. Lerner, Eds. Erlbaum, Hillsdale, NJ, 1992. xxxii, 549 pp., illus. \$89.95. From a conference, Trier, Germany, July 1989.

**Medical Journals and Medical Knowledge.** Historical Essays. W. F. Bynum, Stephen Lock, and Roy Porter, Eds. Routledge, Chapman and Hall, New York, 1992. xii, 279 pp. \$97.50. Wellcome Institute Series in the History of Medicine.

**Nonlinear Superconductive Electronics and Josephson Devices.** Giovanni Costabile *et al.*, Eds. Plenum, New York, 1992. xiv, 442 pp., illus. \$110. From a workshop, Capri, Italy, Sept. 1990.

**Organic Synthesis.** The Roles of Boron and Silicon. Susan E. Thomas. Oxford University Press, New York, 1992. iv, 92 pp., illus. \$29.95; paper, \$9.95. Oxford Chemistry Primers.

**Physical Cosmology.** A. Blanchard *et al.*, Eds. Editions Frontières, Gif-sur-Yvette Cedex, France, 1992. xxiv, 626 pp., illus., + plates. \$87. From a conference, Chateau de Blois, France, Aug. 1990.

**Reinforcement in Functional Systems.** Konstantin V. Sudakov, Ed. Gordon and Breach, Philadelphia, 1992. xii, 234 pp., illus. \$60. Systems Research in Physiology, vol. 4.

**A Systems Analysis of the Global Boreal Forest.** Herman H. Shugart, Rik Leemans, and Gordon B. Bonan, Eds. Cambridge University Press, New York, 1992. xii, 565 pp., illus. \$110.

**Toward Sustainability.** Soil and Water Research Priorities for Developing Countries. National Research Council. National Academy Press, Washington, DC, 1992. x, 65 pp., illus. Paper, \$19.

**The Voice of the Dolphins.** And Other Stories. Leo Szilard. 2nd ed. Stanford University Press, Stanford, CA, 1992. viii, 182 pp., illus. \$20; paper, \$8.95. Stanford Nuclear Age Series.

**War and Healing.** Stanhope Bayne-Jones and the Maturing of American Medicine. Albert E. Cowdrey. Louisiana State University Press, Baton Rouge, 1992. xx, 230 pp., illus. \$35. Southern Biography Series.