

leaving the chemosensory system a good third. The emphasis of the treatment reflects that of the research that has been done.

While the octopus is mostly known scientifically through the work of J. Z. Young and for the hope that its brain may provide us with a key to the "en-gram," this book presents the animal in a broad perspective. This will make the book useful for the neurobiologist who needs to know what kind of body the nervous system lives in and has to adapt to.

The book is well written and pleasant to read. There are many illustrations, all of good quality, and a lot of information that is difficult to find elsewhere. This book should be on the bookshelves of all zoologists, for themselves and for their students.

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Medieval Sciences

Science in the Middle Ages. DAVID C. LINDBERG, Ed. University of Chicago Press, Chicago, 1979. xvi, 550 pp., illus. \$40. The Chicago History of Science and Medicine.

Stimulated by the earlier work of men such as Pierre Duhem and Lynn Thorndike, the study of medieval science has in the last few decades blossomed forth into a well-defined and illuminating field of study, flourishing particularly in North America. At present there are a number of distinguished workers in the field, and a good number of them are represented in the present volume, which shows the collectively high level of the subject. Until recently there have been no adequate general introductions to the subject for nonspecialists. Now, within a few years of one another, we have two splendid additions to the literature: Edward Grant's *A Source Book in Medieval Science* (Harvard University Press, 1974) and the book under review, which together provide as good an orientation as any beginner is entitled to expect.

The volume edited by Lindberg consists of 15 chapters, each devoted to a different aspect of medieval science. Except for the excellent concise chapter (by Lindberg) on the transmission of Greek and Arabic learning to the West, the focus is squarely upon Western European science, and little note is taken of Islamic or Jewish science. Though the editorial preface characterizes the Middle Ages as

the period 400 to 1500, some contributors say little about the period after 1350 and others continue their narrative into the 16th and even 17th centuries. The lack of a definable "Renaissance" in science has made the boundaries between "medieval" and "modern" very flexible. The level of exposition is also somewhat variable, many contributors achieving important brief syntheses of their subjects, as valuable for the specialist as for the beginner, and others doing no more than provide adequate introductions. As might be expected, given the state of research, the balance is very much in favor of physical science. The topics covered include mathematics, the science of weights, the science of motion, cosmology, astronomy, optics, the science of matter, medicine, and natural history. In addition there are sections on early medieval science, the transmission of Greek and Arabic science, the philosophical and institutional settings, "the nature, scope, and classification of the sciences," and the relation of science to magic. There is also a useful bibliography.

Several of the contributions are particularly noteworthy. These are "Mathematics" by M. S. Mahoney, "Natural history" by J. Stannard, and "The science of motion" by J. E. Murdoch and E. D. Sylla. Each brings a vast primary and secondary literature under control. Never do I recall seeing the general trends of medieval mathematics discussed so clearly as Mahoney has done; the techniques of computation by the abacus, for example, are well explained; and the notes provide a most useful bibliographical orientation for the more advanced student. Stannard's piece is also a bibliographical tour de force, supporting a clear exposition of the strengths and weaknesses of medieval natural history, based on the latest (mostly German) research in the field. Murdoch and Sylla have presented their difficult subject with their accustomed thoroughness, pointing to the failure as well as the accomplishments of medieval ideas on motion.

There is but one paper in the volume that I find seriously deficient, B. Hansen's "Science and magic." The focus of the paper is on the 16th and 17th centuries, and there is little detailed discussion of the medieval aspects of the subject or of the Islamic background to medieval magic. Moreover, medieval and Renaissance magic are interpreted as part of the same whole, though the generation of Ficino and Pico gave the subject an intellectual respectability that it generally lacked in the Middle Ages

and paved the way for the concern of Agrippa, Reuchlin, Cardano, Postel, Dee, and Bruno, and others with it in the next century. In this regard the illuminating studies of Garin, Vasoli, and Zambelli have not been utilized. Hansen also uncritically follows certain authorities in adopting the term "Hermeticism" to portray a particular type of magic (why is nothing said of the role of the *Picatrix* and of Orphic and Zoroastrian texts in the development of magic?). One characterization of "Hermeticism" that he cites could equally well be applied to Platonism, Neopythagoreanism, or numerous other more clearly defined and more widespread bodies of ideas, and he does not take into account recent critical comments on the validity of "Hermeticism" as a historical term.

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Books Received

Advances in Chemical Engineering. Vol. 10. Thomas B. Drew, Giles R. Cokelet, John W. Hoopes, Jr., and Theodore Vermeulen, Eds. Academic Press, New York, 1978. xvi, 336 pp., illus. \$35.

Advances in Electronics and Electron Physics. Vol. 46. L. Marton and Claire Marton, Eds. Academic Press, New York, 1978. xii, 404 pp., illus. \$37.50.

Advances in Instructional Psychology. Vol. I. Robert Glaser, Ed. Erlbaum, Hillsdale, N.J., 1978 (distributor, Halsted [Wiley], New York). xiv, 304 pp., illus. \$16.50.

After Metaphysics. Toward a Grammar of Interaction and Discourse. Harvey Sarles. Peter de Ridder Press, Lisse, The Netherlands, 1977 (U.S. distributor, Humanities Press, Atlantic Highlands, N.J.). 286 pp. Paper, \$21.75. Studies in Semiotics, 13.

Aging. A Guide to Reference Sources, Journals and Government Publications. B. McIlvaine and Mohini Mundkur with Lana L. Yurchyshyn and Lucy DeLuca. University of Connecticut Library, Storrs, 1978. xii, 162 pp. Paper, \$5. University of Connecticut Library, Storrs, Bibliography Series, No. 11.

Amino Acids as Chemical Transmitters. Proceedings of a NATO Advanced Study Institute, Oslo, Aug. 1977. Frode Fonnum, Ed. Plenum, New York, 1978. xii, 748 pp., illus. \$49.50. NATO Advanced Study Institutes Series A, vol. 16.

Ausgleichsrechnung II. Aufgaben und Beispiele zur Praktischen Anwendung. Helmut Wolf. Dümmler, Bonn, Germany, 1979. xiv, 354 pp., illus. Paper, DM 48. Dümmlerbuch 7836.

Biochemistry of Wounded Plant Tissues. Günter Kahl. Walter de Gruyter, New York, 1978. xii, 680 pp., illus. \$100.

The Biogeochemistry of Lead in the Environment. Part B, Biological Effects. J. O. Nriagu, Ed. Elsevier/North-Holland, New York, 1978. xii, 398 pp., illus. \$67.50. Topics in Environmental Health, vol. 1B.

Biology of Fresh Waters. Peter S. Maitland.

Halsted (Wiley), New York, 1978. xii, 244 pp., illus. \$18.95. Tertiary Level Biology.

Biomathematics and Cell Kinetics. Papers from a workshop, Paris, Feb. 1978. A.-J. Valeron and P. D. M. Macdonald, Eds. Elsevier/North-Holland, New York, 1978. xviii, 432 pp., illus. \$60. Developments in Cell Biology, vol. 2.

Biomechanics VI-A. Proceedings of a congress, Copenhagen, 1977. Erling Asmussen and Kurt Jørgensen, Eds. University Park Press, Baltimore, 1978. xxviii, 458 pp., illus. \$29.50. International Series on Biomechanics, vol. 2A.

Biomolecular Information Theory. Serafin Fraga, K. M. S. Saxena, and Manuel Torres. Elsevier, New York, 1978. x, 272 pp., illus. \$48.75. Studies in Physical and Theoretical Chemistry, 4.

Birds of Man's World. Derek Goodwin. Illustrations by Robin Prytherch. British Museum (Natural History), London, and Cornell University Press, Ithaca, N.Y., 1978. viii, 184 pp. \$10.95.

Clinical and Experimental Neurology. Proceedings of the Australian Association of Neurologists, vol. 14. John H. Tyrer and Mervyn J. Eadie, Eds. University Park Press, Baltimore, 1978. x, 282 pp., illus. \$37.50.

Closing the Gap between Technology and Application. Proceedings of a conference, Minneapolis, Oct. 1977. James C. Emery, Ed. Published for EDUCOM by Westview Press, Boulder, Colo., 1978. xii, 216 pp. \$20. EDUCOM Series in Computing and Telecommunications in Higher Education, 1.

Coal Conversion Technical Data Book. U.S. Department of Energy, Washington, D.C., 1978 (available from the Superintendent of Documents, Washington, D.C.). Various pages, illus. Paper, \$35. HCP/T2286-01

Coastal Engineering. An Introduction to Ocean Engineering. Kiyoshi Horikawa. Translated from the Japanese edition (Tokyo, 1973). Halsted (Wiley), New York, 1978. xii, 402 pp., illus. \$35.

The Coblentz Society Desk Book of Infrared Spectra. Clara D. Craver, Ed. Coblentz Society, Kirkwood, Mo., 1977. vi, 498 pp., illus. \$90.

Codex Vindobonensis Mexicanus I. A Commentary. Jill Leslie Furst. Institute for Mesoamerican Studies, State University of New York, Albany, 1978. xxx, 366 pp., illus. Paper, \$9. Institute for Mesoamerican Studies, Publication No. 4.

Cognitive Processes in Animal Behavior. Papers from a conference, Halifax, Canada, June 1976. Stewart Hulse, Harry Fowler, and Werner K. Honig, Eds. Erlbaum, Hillsdale, N.J., 1978 (distributor, Halsted [Wiley], New York). xiv, 466 pp., illus. \$29.95.

Color and Human Response. Aspects of Light and Color Bearing on the Reactions of Living Things and the Welfare of Human Beings. Faber Birren. Van Nostrand Reinhold, New York, 1978. viii, 142 pp., illus. + plates. \$11.95.

Communicating with Deaf People. A Resource Manual for Teachers and Students of American Sign Language. Harry W. Hoemann. Illustrations by Shirley A. Hoemann. University Park Press, Baltimore, 1978. xxviii, 124 pp. \$10.95. Perspectives in Audiology Series.

Contemporary Topics in Immunobiology. Vol. 8. Noel L. Warner and Max D. Cooper, Eds. Plenum, New York, 1978. xiv, 272 pp., illus. \$27.50.

The Context of Environmental Politics. Unfinished Business for America's Third Cen-

tury. Harold Sprout and Margaret Sprout. University Press of Kentucky, Lexington, 1978. viii, 216 pp. \$9.75.

Copper Mining and Management. Thomas R. Navin. University of Arizona Press, Tucson, 1978. xxiv, 426 pp., illus. Cloth, \$16.50; paper, \$9.75.

Crystal Growth. Theory and Techniques. Vol. 2. C. H. L. Goodman, Ed. Plenum, New York, 1978. x, 192 pp., illus. \$24.50.

Cyclitols and Phosphoinositides. Proceedings of a symposium, East Lansing, Mich., June 1977. William W. Wells and Frank Eisenberg, Jr., Eds. Academic Press, New York, 1978. xvi, 608 pp., illus. \$32.

A Dictionary of Microbial Taxonomy. S. T. Cowan. L. R. Hill, Ed. Cambridge University Press, New York, 1978. xii, 286 pp. \$28.50.

Discovery, Development and Delivery of New Drugs. Karl H. Beyer, Jr. SP Medical and Scientific Books (Spectrum), New York, 1978. xvi, 238 pp., illus. \$20. Monographs in Pharmacology and Physiology, vol. 3.

Energy Modeling for an Uncertain Future. Study of Nuclear and Alternative Energy System, Supporting Paper 2. National Academy of Sciences, Washington, D.C., 1978. xxiii, 226 pp., illus. Paper, \$9.75.

Energy Utilization and Environmental Health. Methods for Prediction and Evaluation of Impact on Human Health. Richard A. Wadden, Ed. Wiley-Interscience, New York, 1978. xvi, 200 pp., illus. \$23.95. Environmental Science and Technology.

Enjoying Indiana Birds. Alfred (Bud) Starling. Drawings by Donna L. McCarty. Indiana University Press, Bloomington, 1978. xx, 308 pp. \$17.50.

Environmental Pollution and Human Health. Proceedings of a symposium, Lucknow, India, Nov. 1975. S. H. Zaidi, Ed. Industrial Toxicology Research Centre, Lucknow, India, 1977. viii, 912 pp., illus. \$15.

EPH-Gestosis. Papers from a meeting, Davos, Switzerland, Nov. 1977. E. T. Rippmann and H. Stamm, Eds. Organisation Gestosis-Press, Basel, 1978. 374 pp., illus. Paper, SwF 50.

Epidemics. Geoffrey Marks and William K. Beatty. Scribner, New York, 1978. xii, 324 pp., illus. Paper, \$4.95. Reprint of the 1976 edition.

The Equilibrium of Natural Streams. Elizabeth A. West. Geo Abstracts Ltd. (University of East Anglia), Norwich, England, 1978. xvi, 206 pp., illus. Cloth, \$13; paper, \$10.70.

Errors in Practical Measurement in Science, Engineering, and Technology. B. Austin Barry. M. D. Morris, Ed. Wiley-Interscience, New York, 1978. xvi, 184 pp., illus. \$17.50.

The Esophagus. Leo van der Reis, Ed. Karger, Basel, 1978. x, 166 pp., illus. \$53.50. Frontiers of Gastrointestinal Research, vol. 3.

Essential Concepts in Immunology. Irving L. Weissman, Leroy E. Hood, and William B. Wood. Benjamin/Cummings, Menlo Park, Calif., 1978. x, 166 pp., illus. Paper, \$6.95.

Essentials of Toxicology. Ted A. Loomis. Lea and Febiger, Philadelphia, ed. 3, 1978. x, 246 pp., illus. \$12.50.

Geomorphology. A Systematic Analysis of Late Cenozoic Landforms. Arthur L. Bloom. Prentice-Hall, Englewood Cliffs, N.J., 1978. xviii, 510 pp., illus. \$22.50.

God and the Astronomers. Robert Jastrow. Norton, New York, 1978. 136 pp., illus. \$7.95.

Gorillas Are Vanishing Intriguing Primates. Michael F. Murphy. Published by the author, 3050 Rue D'Orleans, San Diego, Calif., 1978. vi, 88 pp., illus. Paper, \$5.95.

Green Immigrants. The Plants That Transformed America. Claire Shaver Haughton. Drawings by Russell Peterson. Harcourt Brace Jovanovich, New York, 1978. xii, 450 pp. \$12.95.

Group Processes. Papers from *Advances in Experimental Social Psychology*. Leonard Berkowitz, Ed. Academic Press, New York, 1978. xvi, 428 pp., illus. Paper, \$13.50.

The Growth of the Child. Reflections on Human Development. Jerome Kagan. Norton, New York, 1978. 284 pp. \$12.95.

Hemolytic Anemia in Disorders of Red Cell Metabolism. Ernest Beutler, Plenum, New York, 1978. xiv, 266 pp., \$23.50. Topics in Hematology.

Heparin. H. Engelberg. Arterial Mast Cells. R. W. Robinson, I. N. Likar, and L. J. Likar. Karger, Basel, 1978. viii, 116 pp. Paper, \$38. Monographs on Atherosclerosis, vol. 8.

Histodiagnosis and Clinical Correlation of Rheumatoid and Other Synovitis. Arnold Soren. Lippincott, Philadelphia, and Thieme, Stuttgart, Germany, 1978. vii, 180 pp., illus. \$33.

Homeowner's Guide to Landscaping That Saves Energy Dollars. Ruth S. Foster. McKay, New York, 1978. viii, 184 pp., illus. Paper, \$5.95.

The Hospice Movement. A Better Way of Caring for the Dying. Sandol Stoddard. Vintage (Random House), New York, 1978. xx, 348 pp. Paper, \$2.50. Reprint of the cloth edition (1978).

Human Growth. Vol. 1, Principles and Prenatal Growth. Frank Falkner and J. M. Tanner, Eds. Plenum, New York, 1978. xx, 634 pp., illus. \$35.

Hysteria. The Elusive Neurosis. Alan Krohn. International Universities Press, New York, 1978. x, 348 pp. \$20. *Psychological Issues*, vol. 12, Nos. 1/2, monograph 45/46.

Living with Renal Failure. Proceedings of a symposium, Stirling, Scotland, July 1977. J. L. Anderton, F. M. Parsons, and D. E. Jones, Eds. University Park Press, Baltimore, 1978. xii, 282 pp., illus. \$29.50.

Longitudinal Unbalanced Loads on Transmission Line Structures. Prepared by GAI Consultants. Electric Power Research Institute, Palo Alto, Calif., 1978. Various pages, illus. Paper, \$22.50. EPRI EL-643.

Measurement of Dissolved Oxygen. Michael L. Hitchman. Wiley-Interscience, New York, 1978. xvi, 256 pp., illus. \$23.50. Chemical Analysis, vol. 49.

Mechanics of Fibre Composites. V. K. Tewary. Halsted (Wiley), New York, 1978. xii, 288 pp., illus. \$10.95.

Medicinal Plants of West Africa. Edward S. Ayensu. Reference Publications, Algonac, Mich., 1978. 330 pp., illus. \$29.95.

La Notion d'Organisation dans l'Histoire de la Biologie. Joseph Schiller. Maloine, Paris, 1978. vi, 138 pp. Paper, 70 F. Recherches Interdisciplinaires.

Numerical Methods in Laminar and Turbulent Flow. Proceedings of a conference, Swansea, U.K., July 1978. C. Taylor, K. Morgan, and C. A. Brebbia, Eds. Halsted (Wiley), New York, 1978. xiv, 1006 pp., illus. \$55.

Physics of Thin Films. Advances in Research and Development. Vol. 10. Georg Hass and Maurice H. Francombe, Eds. Academic Press, New York, 1978. xii, 324 pp., illus. \$35.

Physicochemical Aspects of Protein Denaturation. Savo Lapanje. Wiley-Interscience, New York, 1978. xii, 332 pp., illus. \$27.50.

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AAAS NEWS

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mental Defense Fund, Brown's work in the science community will continue, though in a different area, but the work of the Office of Opportunities in Science will stand as an ongoing tribute to its first leader.

RAYNA GREEN
*Director, Project on Native
Americans in Science*

(Rayna Green has been appointed acting head of the Office while a search for Brown's replacement is under way.)

PSA to Meet in the Soviet Union

The 14th congress of the Pacific Science Association (PSA) will be held 20 August–5 September 1979 at Khabarovsk, hosted by the Academy of Sciences of the U.S.S.R. The central theme of the meeting will be "Natural Resources of the Pacific Ocean," with emphasis on the ecosystems of Pacific islands, marine resources, and solid earth sciences. Some 40 symposia in 14 subject areas are planned, together with more than a dozen scientific tours (optional) in areas ranging from 450 to 2500 kilometers from Khabarovsk and providing access to varying ecosystems and geological formations.

Scientific organizations from 45 countries are members of PSA, including the U.S. National Academy of Sciences. The AAAS is an associate member of PSA and has been represented on occasion at previous congresses, which have been held since 1920. Information on the 1979 meeting can be obtained from the secretary-general of PSA, Brenda Bishop, PSA, P.O. Box 17801, Honolulu, Hawaii 96817. Scientists who are already planning to attend are also requested to inform Ms. Bishop of their plans, in order to expedite coordination.

PRC Visits AAAS

Another step in forming a closer relationship between the AAAS and the People's Republic of China (PRC) will be taken later this month when a delegation from the PRC visits the United States as guests of the AAAS. The group will arrive in Washington, D.C., on 12 May.

The Chinese are returning the visit

made by the AAAS Board of Directors to the PRC last fall. While in China, the AAAS board was hosted by the Scientific and Technical Association of the People's Republic of China (STAPRC) (see *Science*, 9 February 1979).

Approximately 20 Chinese scientists and science policy-makers will visit the United States under the auspices of the STAPRC. Their special interests will include electronics, biochemistry, agriculture, medicine, and the "popularization" of science. In addition to Washington, D.C., the group will visit Philadelphia, Princeton, New York, Boston, Chicago, Seattle, San Francisco, and Los Angeles. They will depart from Honolulu on 4 June.

The purpose of the visit is to further facilitate scientific and technical cooperation between the United States and the PRC and to promote cooperation between the AAAS and the STAPRC.

The itinerary for the Chinese visit is being developed by the AAAS Executive Office.

African Philosophers Meet in Benin

The largest single gathering in history of African philosophers was held in Cotonou, Republic of Benin, 18–23 December 1978. Approximately two-thirds of all African universities having departments of philosophy were represented.

The theme for the conference was "Philosophy and the Development of the Sciences in Africa." Presentations were divided into three areas (i) the teaching of philosophy, (ii) social and political philosophy, and (iii) the philosophy of science.

Leonard Harris of the department of philosophy, University of the District of Columbia, was the only American invited to the conference. He attended as a representative of the AAAS and the Committee on Black Philosophy of the American Philosophical Association. Harris was appointed chairman of the social and political philosophy committee at the conference.

For more information about the activities and publications described in AAAS News, write to the appropriate office, AAAS, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036, unless otherwise indicated.

BOOKS RECEIVED

(Continued from page 494)

Physiology of Reproduction and Artificial Insemination of Cattle. G. W. Salisbury, N. L. Van Demark, and J. R. Lodge. Freeman, San Francisco, ed. 2, 1978. xviii, 798 pp., illus. \$29.50. A Series of Books in Animal Science.

Planetary Encounters. Robert M. Powers. Original drawings by Helen Zane Jensen. Stackpole Books, Harrisburg, Pa., 1978. 288 pp. + plates. \$13.95.

Sea Floor Development. Moving into Deep Water. Papers from a meeting. June 1977. The Royal Society, London, 1978. vi, 190 pp., illus. + plates. £15.45. First published in *Philosophical Transactions of the Royal Society of London*, series A, vol. 290.

Selected Topics of the Theory of Chemical Elementary Processes. E. E. Nikitin and L. Züllicke. Springer-Verlag, New York, 1978. x, 176 pp., illus. Paper, \$8.90. Lecture Notes in Chemistry, vol. 8.

The Sense of Touch. E. H. Weber. *De Tactu* translated by H. E. Ross. *Der Tastsinn* translated by D. J. Murray. Published for Experimental Psychology Society by Academic Press, New York, 1978. x, 278 pp. \$15.25.

Serotonin in Health and Disease. Walter B. Essman, Ed. SP Medical and Scientific Books (Spectrum), New York, 1978. Vol. 1, Availability, Localization and Disposition. xx, 410 pp., illus. \$37.50. Vol. 3, The Central Nervous System. xxiv, 460 pp., illus. \$37.50.

Stars and Nebulas. William J. Kaufmann, III. Freeman, San Francisco, 1978. x, 204 pp., illus. + plates. Cloth, \$13; paper, \$7.

Statistical Studies of Historical Social Structure. Kenneth W. Wachter with Eugene A. Hammel and Peter Laslett. Academic Press, New York, 1978. xxiv, 230 pp. \$17.50.

Status Asthmaticus. Proceedings of a symposium, Boston, June 1977. Earle B. Weiss, Ed. University Park Press, Baltimore, 1978. xiv, 408 pp., illus. \$24.50.

The Strategic Role of Perigean Spring Tides in Nautical History and North American Coastal Flooding, 1635–1976. Fergus J. Wood. National Oceanic and Atmospheric Administration, Washington, D.C., 1978 (available from the Superintendent of Documents, Washington, D.C.). xxxii, 538 pp., illus. \$10.75. Stock No. 003-017-00420-1.

Strategies in Cold. Natural Torpidity and Thermogenesis. Papers from a symposium, Jasper Park Lodge, Alberta, Canada, Oct. 1977. Lawrence C. H. Wang and Jack W. Hudson, Eds. Academic Press, New York, 1978. xiv, 716 pp., illus. \$33.

Stress Analysis of Pressurized Water Reactor Steam Generator Tube Denting Phenomena. Prepared by Failure Analysis Associates. Electric Power Research Institute, Palo Alto, Calif., 1978. Variously pagged, illus. Paper, \$5.25. EPRI NP-828.

The Structure of Planets. G. H. A. Cole. Wykeham, London, and Crane, Russak, New York, 1978. viii, 234 pp., illus. \$19.50. The Wykeham Science Series.

The Study of Landforms. A Textbook of Geomorphology. R. J. Small. Cambridge University Press, New York, ed. 2, 1978. x, 502 pp., illus. Cloth, \$34.50; paper, \$13.95.

Thermoelectricity in Metallic Conductors. Proceedings of a conference, East Lansing, Mich., Aug. 1977. Frank J. Blatt and Peter J. Blatt and Peter A. Schroeder, Eds. Plenum, New York, 1978. x, 422 pp., illus. \$42.50.