

als), is most unique and valuable; the theoretical problem is very difficult, and nowhere is there such a good summary of the useful approximations and the salient results.

While aimed at senior students, the book will be very useful to mature workers who need to gain a quick mastery of the field. It is doubtful whether this volume would be used in this country as a course text, but it would make good supplementary reading in a solid-state course and could be used as a basis for special student projects.

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Cosmological Letters on the Arrangement of the World-Edifice

J. H. Lambert (trans., S. L. Jaki)
245 pp. Science History (Neale Watson),
New York, 1976. \$18.00

Historians of science are again in debt to Stanley L. Jaki, for another excellent work on the history of cosmology. This new book is a complete, annotated translation of Johann Heinrich Lambert's *Cosmological Letters on the Arrangement of the World-Edifice*.

A modern translation of the *Cosmologische Briefe über die Einrichtung des Weltbaues* (Augsburg, 1761) has long been needed. Although some parts of it have received wide circulation due to Milton K. Munitz's *Theories of the Universe*, the only English-language edition of the entire *Cosmologische Briefe* to date

has been a 19th-century translation of a French summary of the original German.

The cosmological ideas of Lambert, and their relation to those of Immanuel Kant and Thomas Wright of Durham, are the traditional starting point for historical studies on the discovery of the nature and extent of the Milky Way, the galaxies and the universe as a whole. Jaki's edition of this important work finally provides the companion volume to W. Hastie's translation of Kant's *Universal Natural History and Theory of the Heavens* and Michael Hoskin's treatise on Wright's *Original Theory and New Hypothesis of the Universe*.

The *Cosmological Letters* contains the translation of Lambert's original work (with 27 pages of footnotes) and a 42-page introduction (with 16 pages of notes) by Jaki. The introduction describes Lambert's life and work, the origin of the *Cosmologische Briefe*, a synopsis of each of the 20 "letters," the cosmological background of the work, its reception and its relation to modern cosmology. Jaki's careful, detailed study of the influences among Lambert, Wright, Kant and the other scientists of the era and his authoritative assessment of Lambert's arguments and theories are really the most important features of this new book. While the translation of the *Cosmologische Briefe* will undoubtedly become an essential source book for historians of science, it is Jaki's analysis that makes this volume a fundamental contribution to the subject.

One of the issues Jaki addresses concerns the claim of other historians that the ideas of Lambert are similar to those of Wright and Kant. Jaki demonstrates clearly that not only are the details of the theories fundamentally different, but also that the motivations for constructing cosmologies were different. While Wright based his theories on mystical and religious grounds and Kant based his on evolutionary ideas and Newtonian mechanics, Lambert was influenced by teleological considerations and by comets.

The appearance of a comet in 1759, predicted by Edmund Halley, had a strong influence on Lambert. Much of the *Cosmologische Briefe* is concerned with comets—their number, their nature and the possibility of their collision with other bodies. This concern with comets, coupled with Lambert's belief in a purposeful universe, led him to construct a system of the world that was unevolving, collision-free and built up of hierarchies of stellar systems.

Like Jaki's other major studies on the history of cosmology, *The Milky Way and The Paradox of Olbers's Paradox*, the *Cosmological Letters* is an authoritative, scholarly work. Jaki's study of all of the published material, his thorough search of Lambert's unpublished correspondence and his fine talent for translating difficult

German into lucid English are combined in a richly documented volume that is easy to read, enormously instructive and thoroughly enjoyable.

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book notes

Energy from Solid Wastes. P. N. Cheremisinoff, A. C. Morresi. 505 pp. Marcel Dekker, New York, 1976. \$35.00

According to the authors, "The energy locked up in trash in the United States alone amounts to over 900 trillion BTU annually." We've been hearing about the vast potential in the extraction of energy from waste products for some time; here is a book that describes *available* conversion methods. Its audience will include not only environmental and pollution-control engineers, but also scientists, businessmen and all those concerned about energy sources. The book contains chapters on plastics recycling, pyrolysis and solid-waste separation methods, as well as on many other topics.

Mathematical Methods for Physics. H. W. Wyld. 628 pp. W. A. Benjamin (Advanced Book Program), Reading, Mass., 1976. \$26.50 clothbound, \$16.50 paperback

Henry Wyld tells us in his Preface that this text has its origins in a lecture course he has given for "a number of years" to graduate students. He restricts the treatment to standard classical-analysis topics in mathematical physics, with no coverage of group-theoretical methods or Hilbert space. Nonetheless, the book is intended to give students the basic background necessary to perform calculations in quantum, as well as in classical, physics. The volume consists of three parts: Homogeneous Boundary-Value Problems and Special Functions; Inhomogeneous Problems, Green's Functions and Integral Equations, and Complex-Variable Techniques.

Principles of Cosmology and Gravitation. M. Berry. 179 pp. Cambridge U.P., New York, 1976.

A novel feature of this book is the author's avoidance of tensor calculation in his development of general relativity theory. Michael Berry accomplishes this feat by confining himself to highly symmetrical spacetimes; he determines the metric tensor by use of Gauss's formula for the curvature of an ordinary two-dimensional surface. The book is intended for the physics student in his final undergraduate year, and Berry assumes familiarity with special relativity and a



A bust of Lambert. The original resided in the Stadtmuseum Mulhausen in Alsace. This photograph appears in *Johann Friedrich Lambert: Leistung und Leben*, Braun and Co., Mulhausen, 1943, kindly supplied by S. Jaki.

knowledge of the calculus. This volume is cosmology-centered: Berry begins with a chapter on cosmography and ends with a discussion of the primeval ylem. —FCB

new books

Particles, Nuclei and High-Energy Physics

The Theory of Multiple Processes. Yu. P. Nikitin, I. P. Rosental. 230 pp. Atomizdat, Moscow, 1976. (In Russian, price not stated)

Proceedings of the Conference on Neutron Scattering, Vols. 1 and 2 (Gatlinburg, Tenn., June 1976). R. M. Moon, ed. 1172 pp. (Available as Conf-760601-P1 and P2 from NTIS, US Dept. of Commerce, Springfield, Va. 22161 for \$13.75)

Elementary Particle Physics (Springer Tracts in Modern Physics, Vol. 79). H. Rollnik, P. Stichel, E. Paul. 145 pp. Springer-Verlag, New York, 1976. \$26.30.

Proceedings of the International Conference on the Interactions of Neutrons with Nuclei, Vols. 1 and 2 (Lowell, Mass., July 1976). E. Sheldon, ed. 1645 pp. Technical Information Center, Energy Research and Development Administration, Oak Ridge, Tenn., 1976. (Available as Conf-760715-P1 and P2 from NTIS, US Dept. of Commerce, Springfield, Va. 22161 for \$21.25)

Fourier Transform N.M.R. Spectroscopy. D. Shaw. 357 pp. Elsevier, Amsterdam, 1976. \$49.75

Spallation, Nuclear Reactions and Their Applications. B. S. P. Shen, M. Merker, eds. 235 pp. D. Reidel, Boston, 1976. \$27.50

Atomic, Molecular and Chemical Physics

Treatise on Solid State Chemistry, Vols. 3 and 4. N. B. Hannay, ed. 774 and 721 pp., respectively. Plenum, New York, 1976. \$45.00 each volume

Beam-Foil Spectroscopy (Topics in Current Physics, Vol. 1). S. Bashkin, ed. 318 pp. Springer-Verlag, New York, 1976. \$28.30

Introduction to the Physical Chemistry of the Vitreous State. P. Balta, E. Balta. 287 pp. Abacus, Tunbridge Wells, England (US distributor: ISBS Inc, P.O. Box 555, Forest Grove, Ore. 97116), 1976. \$38.50

Thermochemical Kinetics, 2nd edition: Methods for the Estimation of Thermochemical Data and Rate Parameters. S. W. Benson. 320 pp. Wiley, New York, 1976. \$22.50

Molecular Spectroscopy: Modern Research, Vol. 2. K. N. Rao, ed. 279 pp. Academic, New York, 1976. \$29.50

Handbook of Atomic Data. S. Fraga, J. Karwowski, K. M. S. Saxena. 551 pp. Elsevier, New York, 1976. \$49.75

Atoms and Molecules in Electric Fields. N. Ryde. 455 pp. Almqvist and Wiksell Inter-

national, Stockholm, 1976. 315.00 Sw. Kr.

Optics and Acoustics

Optics and Information Theory. F. T. S. Yu. 203 pp. Wiley, New York, 1976. \$14.95

Musical Acoustics: Selected Reprints. T. Rossing, ed. 212 pp. American Association of Physics Teachers, SUNY, Stony Brook, N.Y., 1976. \$4.55 for AAPT members, \$6.50 for non-members

Electricity, Magnetism and Fields

Electricity and Magnetism, 3rd edition. B. I. Bleaney, B. Bleaney. 762 pp. Oxford U.P., New York, 1976. \$38.50 clothbound, \$22.00 paperbound

Quantum Electronics and Lasers

Electronic Transition Lasers (Proc. of a Second Summer Colloquium held at the Marine Biology Laboratory Conference Center, Woods Hole, Mass., September 1975). J. I. Steinfeld, ed. 311 pp. MIT, Cambridge, 1976. \$14.95

Lasers and Their Applications. M. J. Beesley. 253 pp. Halsted, New York, 1976. \$19.50

Handbook of Chemical Lasers. R. W. F. Gross, J. F. Bott, eds. 744 pp. Wiley, New York, 1976. \$39.95

Tunable Lasers and Applications (Proc. of the Loen Conference, Norway, 1976). A. Mooradian, T. Jaeger, P. Stokseth, eds. 404 pp. Springer-Verlag, New York, 1976. \$24.90

Fluids and Plasmas

Third Topical Conference on Pulsed High Beta Plasmas (Proc. of a conf. held at Culham Laboratory, Abingdon, Oxon, UK, September 1975). D. E. Evans, ed. 625 pp. Pergamon, Oxford, England, 1976. \$30.00

Plasma Physics. E. W. Laing. 163 pp. Sussex U.P., London, 1976. £5.00

Crystallography, Low-Temperature and Solid-State Physics

Crystal Growth. B. R. Pamplin, ed. 672 pp. Pergamon, Elmsford, N.Y., 1976. \$45.00 clothbound, \$20.00 paperbound

X-Ray Diffraction Topography. B. K. Tanner. 174 pp. Pergamon, Oxford, England, 1976. £6.25

Lectures on Solid State Physics (International Series in Natural Philosophy, Vol. 79). G. Busch, H. Schade. 538 pp. Pergamon, Elmsford, N.Y., 1976. \$35.00

Progress in Surface and Membrane Science, Vol. 11. D. A. Cadenhead, J. F. Danielli, eds. 345 pp. Academic, New York, 1976. \$21.50

High Resolution NMR Spectroscopy in Solids (NMR Basic Principles and Progress, Vol. 11). M. Mehring. 246 pp. Springer-Verlag, New York, 1976. \$27.90

Astronomy, Cosmology and Space Physics

Man Discovers the Galaxies. R. Berendzen, R. Hart, D. Seeley. 228 pp. Science History

(Neale Watson), New York, 1976. \$15.95 clothbound, \$6.95 paperbound

Comets: An Illustrated Introduction. P. Moore. 149 pp. Scribner's, New York, 1976. \$7.95

Cosmology Now. L. John, ed. 168 pp. Taping, New York, 1976. \$10.95

Theory and Mathematical Physics

Course of Theoretical Physics, Vol. 1: Mechanics, 3rd edition. L. D. Landau, E. M. Lifshitz. 169 pp. Pergamon, Oxford, England, 1976. £6.25

Über den Satz von Trotter mit Anwendungen auf die Approximationstheorie. M. Becker. 36 pp. Westdeutscher Verlag, Wiesbaden, Germany, 1976. DM 9.00

Representations of the Rotation and Lorentz Groups: An Introduction (Lecture Notes in Pure and Applied Mathematics, Vol. 16). M. Carmeli, S. Malin. 117 pp. Marcel Dekker, New York, 1976. \$13.50

Mathematical Physics and Physical Mathematics (Proc. of an Int. Symposium organized by the Mathematical Institute of the Polish Academy of Sciences, The Institute for Nuclear Research and Warsaw University, held in Warsaw, March 1974). K. Maurin, R. Raczka, eds. 504 pp. D. Reidel, Boston, 1976. \$39.00

The Physics of Vibrations and Waves, 2nd edition. H. J. Pain. 357 pp. Wiley, New York, 1976. \$22.00 clothbound, \$10.95 paperbound

Instrumentation and Techniques

Handbook for Chemical Technicians. H. J. Strauss (M. Kaufman, ed.). 454 pp. McGraw-Hill, New York, 1976. \$19.50

Thyristor Physics (Applied Physics and Engineering, Vol. 12). A. Blicher. 304 pp. Springer-Verlag, New York, 1976. \$29.80

Control of Flow Separation: Energy Conservation, Operational Efficiency, and Safety. P. K. Chang. 523 pp. McGraw-Hill, New York, 1976. \$47.50

Applied Spectroscopy Reviews, Vol. 11. E. G. Brame Jr, ed. 337 pp. Marcel Dekker, New York, 1976. \$34.50

Heat, Thermodynamics and Statistical Physics

Phase Transitions and Critical Phenomena, Vol. 5B. C. Domb, M. S. Green, eds. 412 pp. Academic, London, 1976. £13.50

Statistical Mechanics and Properties of Matter: Theory and Applications. E. S. R. Gopal. 302 pp. Halsted, New York, 1976. \$18.50 paperbound

Energy and Environment

Solar Energy: Selected Reprints. D. K. McDaniels, ed. 179 pp. American Association of Physics Teachers, SUNY, Stony Brook, N.Y., 1976. \$4.55 for AAPT members, \$6.50 for non-members

Miscellany

Van Nostrand's Scientific Encyclopedia, 5th edition. D. M. Considine, ed. 2370 pp. Van Nostrand, New York, 1976. \$67.50 □