

diction. It is a delightful and highly personal account of the dynamic interactions of some of the most famous persons in meteorology and climatology, as well as of some of the first computers devoted to the problems of atmospheric modeling.

ANN HENDERSON-SELLERS  
Department of Geography,  
University of Liverpool,  
Liverpool L69 3BX, England

## High-Energy Physics

**Quarks, Gluons and Lattices.** MICHAEL CREUTZ. Cambridge University Press, New York, 1984. vi, 169 pp., illus. \$34.50. Cambridge Monographs on Mathematical Physics.

*Quarks, Gluons and Lattices* is a brief, clear introduction to lattice gauge theory and its applications to quantum chromodynamics, the field theory of interacting quarks and gluons.

The book begins with a discussion of the connection between statistical mechanics and field theory and goes on to introduce Euclidean scalar, fermion, and gauge fields. It then turns to the construction of lattice degrees of freedom, lattice actions, and various techniques of extracting the mathematical and physical content of such theories. Strong coupling and weak coupling expansions, mean field theory, duality, renormalization group transformations, and computer simulation methods, some of which were pioneered by the author, are considered in turn. These topics are illustrated through examples drawn from the recent literature. The computer simulation and numerical evidence for the crucial features of the theory, such as confinement in the continuum limit, are critically and sensibly discussed.

Since a considerable array of topics is essential to a balanced presentation of lattice gauge theory, a short work such as this is forced into compromises. The reader will find sketches of some arguments rather than full presentations and discussions. The references, however, are quite complete, and in all probability they will have to be consulted from time to time. The book does not discuss some actively developing topics, including the lattice topological charge, the lattice Dirac equation, chiral symmetry, species doubling, and the axial anomaly. These are important topics that are not completely understood at this time.

In summary, this timely monograph could serve as a solid centerpiece in a course on lattice gauge theory. If it were

supplemented with additional material covering recent developments, such as the Monte Carlo renormalization group and fermion computer simulations, a very profitable graduate-level course would result. Since lattice gauge theory and its attendant mathematical and numerical methods, such as large-scale computer simulations, are expected to play an important role in high-energy and statistical physics in the coming years, such an enterprise should be well worth the effort devoted to it.

JOHN B. KOGUT  
Loomis Laboratory,  
University of Illinois,  
Urbana 61801

## Books Received

**Aerosols.** An Industrial and Environmental Science. George M. Hidy. Academic Press, Orlando, Fla., 1984. xx, 774 pp., illus. \$89.

**Air Pollution and Plant Life.** Michael Treshow. Ed. Wiley-Interscience, New York, 1984. xii, 486 pp., illus. \$70. Environmental Monographs and Symposia.

**Alice Hamilton.** A Life in Letters. Barbara Sicherman. Harvard University Press, Cambridge, Mass., 1984. xvi, 460 pp. + plates. \$25. A Commonwealth Fund Book.

**The Alkaloids.** Chemistry and Pharmacology. Arnold Brossi. Ed. Academic Press, Orlando, Fla., 1983. Vol. 21. xx, 368 pp., illus. \$49.50. Vol. 22. xviii, 342 pp., illus. \$50.

**The American Academic Profession.** A Synthesis of Social Scientific Inquiry since World War II. Martin J. Finkelstein. Ohio State University Press, Columbus, Ohio, 1984. xii, 289 pp. \$17.50.

**The American Frontier.** An Archaeological Study of Settlement Pattern and Process. Kenneth E. Lewis. Academic Press, Orlando, Fla., 1984. xxviii, 333 pp., illus. \$68.50. Studies in Historical Archaeology.

**Analysis of Ordinal Categorical Data.** Alan Agresti. Wiley, New York, 1984. xii, 287 pp. \$35.95. Wiley Series in Probability and Mathematical Statistics.

**Analytical Profiles of Drug Substances.** Vol. 12. Klaus Florey, Ed. Academic Press, Orlando, Fla., 1983. x, 735 pp., illus. \$47.

**Animal Life-Cycle Feeding and Nutrition.** Tilden Wayne Perry. Academic Press, Orlando, Fla., 1984. xvi, 319 pp., illus. \$24.50. Animal Feeding and Nutrition.

**Annual Review of Biochemistry.** Vol. 53. Charles C. Richardson, Paul D. Boyer, and Alton Meister, Eds. Annual Reviews, Palo Alto, Calif., 1984. xvi, 990 pp., illus. \$29.

**Annual Review of Biophysics and Bioengineering.** Vol. 13. Donald M. Engelman, Charles R. Cantor, and Thomas D. Pollard, Eds. Annual Reviews, Palo Alto, Calif., 1984. x, 538 pp., illus. \$47.

**Annual Review of Materials Science.** Vol. 14. Robert A. Huggins, Joseph A. Giordmaine, and John B. Wachtman, Jr., Eds. Annual Reviews, Palo Alto, Calif., 1984. x, 416 pp., illus. \$64.

**Annual Review of Nutrition.** Vol. 4. William J. Darby, Harry P. Broquist, and Robert E. Olson, Eds. Annual Reviews, Palo Alto, Calif., 1984. xiv, 610 pp., illus. \$27.

**Antimicrobial Drug Resistance.** L. E. Bryan, Ed. Academic Press, Orlando, Fla., 1984. xviii, 576 pp., illus. \$79.

**Antiproton Proton Physics and the W Discovery.** J. Tran Thanh Van, Ed. Editions Frontières, Gif-sur-Yvette, France, 1983. 665 pp., illus. \$65. Moriond Series, 40. From a colloquium, La Plagne, Savoie, France, March 1983.

**Antitumor Drug Resistance.** B. W. Fox and M. Fox, Eds. Springer-Verlag, New York, 1984. xxvi, 738 pp., illus. \$198. Handbook of Experimental Pharmacology, vol. 72.

**Antiviral Agents and Viral Diseases of Man.** George J. Galasso, Thomas C. Merigan, and Robert A. Buchanan, Eds. Raven, New York, 1984. xiv, 577 pp., illus. \$75.

**Applied Atomic Collision Physics.** Vol. 4. Condensed Matter. Sheldon Datz, Ed. Academic Press, Orlando, Fla., 1983. xiv, 632 pp., illus. \$79.

**Beyond Whistleblowing.** Defining Engineers' Responsibilities. Vivian Weil, Ed. Center for the Study of Ethics in the Professions, Illinois Institute of Technology, Chicago, 1983. vi, 334 pp. Paper. From a conference, Chicago, March 1982.

**Biological Foundations and Human Nature.** The Katzir-Katchalsky Lecture Series. Miriam Balaban, Ed. Academic Press, Orlando, Fla., and Balaban, Philadelphia, 1983. vi, 243 pp., illus. \$39.50.

**Biological Oceanographic Processes.** Timothy R. Parsons, Masayuki Takahashi, and Barry Hargrave. 3rd ed. Pergamon, New York, 1984. xii, 330 pp., illus. \$40; paper, \$19.75.

**Biological Processes and Soil Fertility.** J. Tinsley and J. F. Darbyshire, Eds. Nijhoff/Junk, The Hague, 1984 (U.S. distributor, Kluwer Boston, Hingham, Mass.). xxx, 403 pp., illus. \$69. Developments in Plant and Soil Sciences, vol. 11. Reprinted from *Plant and Soil*, vol. 76. From a meeting, Reading, England, July 1983.

**Biology of Lichenized Fungi.** James D. Lawrey. Praeger, New York, 1984. x, 408 pp., illus. \$39.95.

**Biology Today and Tomorrow.** Jack A. Ward and Howard R. Hetzel. 2nd ed. West, St. Paul, Minn., 1984. xx, 557 pp., illus. Cloth.

**Biosafety in Microbiological and Biomedical Laboratories.** Public Health Service, Bethesda, Md., 1984 (available from the Superintendent of Documents, Washington, D.C.). x, 100 pp. Paper, \$4. HHS Publication No. (CDC) 84-8395.

**The Birth of Neurosis.** Myth, Malady, and the Victorians. George Frederick Drinka. Simon and Schuster, New York, 1984. 431 pp., illus. \$21.95.

**Caffeine.** Perspectives from Recent Research. P. B. Dews, Ed. Springer-Verlag, New York, 1984. xx, 260 pp., illus. \$29.

**<sup>14</sup>C and Archaeology.** W. G. Mook and H. T. Waterbolk, Eds. Council of Europe, Strasbourg, 1983 (distributor, T. Hackens, 28a av. Léopold, B-1330 Rixensart, Belgium). 525 pp., illus. Paper, \$70. PACT, 8. From a symposium, Groningen, Aug. 1981.

**The Caribbean-South American Plate Boundary and Regional Tectonics.** William E. Bonini, Robert B. Hargraves, and Reginald Shagam, Eds. Geological Society of America, Boulder, Colo., 1984. x, 421 pp., illus., + maps. \$47.50. The Geological Society of America Memoir 162.

**The Cauchy Method of Residues.** Theory and Applications. Dragoslav S. Mitrinović and Jovan D. Kečkić. Reidel, Boston, 1984 (distributor, Kluwer Boston, Hingham, Mass.). xiv, 361 pp., illus. \$67. Mathematics and Its Applications. Translated from the Serbian edition (Belgrade, 1978).

**A Century of Ulcer Surgery.** Medical and Surgical Therapy Today. Hermann Bünthe and Peter Langhans, Eds. Urban & Schwarzenberg, Baltimore, 1984. xii, 304 pp., illus. Paper, \$44.50. Translated from the German by Glenn E. Whitted. From a symposium, Münster, Oct. 1981.

**Developments in Statistics.** Vol. 4. Paruchuri R. Krishnaiah, Ed. Academic Press, Orlando, Fla., 1983. xiv, 287 pp. \$62.

**Diagnosis and Management of the Hospitalized Child.** Howard B. Levy, Stephen H. Sheldon, and Rabi F. Sulayman. Raven, New York, 1984. xiv, 681 pp., illus. Paper, \$19.75.

**The Dictyostelids.** Kenneth B. Raper, with Ann Worley Rahn. Princeton University Press, Princeton, N.J., 1984. xii, 453 pp., illus. \$75.

**Diet, Diabetes, and Atherosclerosis.** Guido Pozza et al., Eds. Raven, New York, 1984. xviii, 278 pp., illus. \$47.50. From a meeting, Milan.

**Dietwalk™.** The Doctor's Fast and Easy 3-Day Superdiet. Fred A. Stutman. Medical Manor Books, Philadelphia, 1984. xiv, 185 pp., illus. Paper, \$8.95.

**Diffusion.** Mass Transfer in Fluid Systems. E. L. Cussler. Cambridge University Press, New York, 1984. xii, 525 pp., illus. \$49.50.

**Directory of Environment Statistics.** United Nations New York, 1983. vi, 305 pp. Paper, \$30. Department of International Economic and Social Affairs Statistical Papers, Series M, No. 75.

**Dominance and Affection.** The Making of Pets. Yi-Fu Tuan. Yale University Press, New Haven, Conn., 1984. xii, 193 pp., illus. \$19.95.

**The Dragon Hunters.** Frank Graham, Jr. Illustrations by Robert Shetterly. Dutton, New York, 1984. xiv, 334 pp. \$22.95. A Truman Talley Book.

**The Dynamic World of Physics.** Robert T. Dixon, Merrill (Bell and Howell), Columbus, Ohio, 1984. xvi, 560 pp., illus. Cloth.

**The Earth's Magnetic Field.** Its History, Origin and Planetary Perspective. Ronald T. Merrill and Michael W. McElhinny. Academic Press, Orlando, Fla., 1983. xii, 404 pp., illus. \$67.50; paper, \$30. International Geophysics Series, vol. 32.

**Ecological Effects of Fire in South African Ecosystems.** P. de V. Booysen and N. M. Tainton, Eds. Springer-Verlag, New York, 1984. xvi, 426 pp., illus. \$33.50. Ecological Studies, vol. 48.

**Ecology of Tropical Plants.** Margaret L. Vickery. (Continued on page 715)