

taken years of hard work by epilepsy activists inside and outside the medical profession to chip away at the stigma.

Nearly all the authors emphasize the role of lay-medical interaction in defining the disorders and framing the diseases they are concerned with. They thus highlight the *negotiated* quality of disease definitions. New disease designations are not solely the product of medical discovery or knowledge, but often—especially with behavioral disorders or environmental and occupational illnesses—emerge from a complex interaction with sufferers and interested publics. This is reflected also in Gerald Markowitz and David Rosner's chapter on the politics of silicosis and industrial disability and in Janet Tighe's chapter on law and psychiatric diagnosis. The image of physicians discovering a disease and publishing the finding, after which other physicians simply apply that new knowledge in clinical settings, is an inadequate model for understanding how diseases emerge in the medical world.

This volume contains many fine examples of the new social history of disease—more than have been discussed here. The quality of the scholarship is high, and the papers are remarkably readable. I couldn't help being struck, however, by how little cross-over there is between disciplines. For example, virtually all the contributors seem to be unfamiliar with the extensive sociological literature on the medicalization of deviance. As historians of medicine move further into social analysis and medical sociologists delve more into history, the two groups would benefit from reading one another's work.

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Cosmic Backgrounds

The Early Observable Universe from Diffuse Backgrounds. B. ROCCA-VOLMERANGE, J. M. DEHARVENG, and J. TRAN THANH VAN, Eds. Editions Frontières, Gif-sur-Yvette Cedex, France, 1992. xii, 437 pp., illus. \$60. From a meeting, Les Arcs, Savoie, France, March 1991.

Exploration of the early universe through observations of diffuse background radiation has been a main concern of cosmologists for the past decade. Diffuse backgrounds, by definition, tend to originate at great distances and arise from sites that are difficult to identify directly. Hence they carry an element of mystery, which makes for in-

triguing science. The various backgrounds discussed in this compendium include a variety of energetic domains, from the cold-est microwave, infrared, and visible wavelengths to the most energetic ultraviolet, x-ray, and gamma-ray wavelengths. The discussions also include a variety of distance scales, from that of local stars and gas to that of distant galaxies, clusters, and the last scattering surface of the cosmic microwave background radiation near the observable horizon of the universe.

The workshop from which this book is derived was timely in that it was held soon after several significant discoveries in cosmology. One is the result of the first six months of NASA's Cosmic Background Explorer (COBE) project, discussed in an excellent review by Smoot. COBE observations have confirmed the existence of a thermal diffuse microwave background and placed severe constraints on primeval inhomogeneities and the possible existence of a hot intergalactic medium. Smoot also describes the then state-of-the-art results from all three of COBE's payloads, although he does not include the recently reported quadrupole detection. This paper, together with related theoretical papers on the microwave spectrum and background sources by Burdzyuzha *et al.* and Carr *et al.*, is a good introduction to what has become an exceedingly important topic in cosmology during the past few years.

Other timely discussions cover new observations of the diffuse x-ray background from the Roentgensatellit (ROSAT) mission, a joint venture by the United States and the Federal Republic of Germany launched in May 1990. Schmidt *et al.* report on early results of source counts and background for eight ROSAT pointings, covering a total solid angle of 2.6 deg². The spectrum of resolved sources in the 0.5- to 2-keV range is similar to the background, suggesting that the steepening of the background in this energy range, as compared to the extrapolation from higher energies, is due to extragalactic sources. Schmidt *et al.* also report on evidence for structure in the background on a scale of 20 arc minutes, which may be due to structure in the universe at a redshift of approximately 1. Also relevant to the diffuse x-ray background are new results from the French SIGMA telescope, which began operation aboard the Soviet GRANAT space observatory in December 1989. The paper by Ballet *et al.* discusses observations of the flux in the 35-keV to 1.3-MeV range from active galactic nuclei.

The source of the diffuse x-ray background is still not clearly identified, but the aforementioned papers, combined with a review by de Zotti *et al.* and related papers by Collin-Souffrin, Schaeffer, and Blanchard *et al.*, provide a good introduction to the mystery. The

more recent observations of the spectrum from 30 keV to 10 GeV from the NASA Compton Gamma-Ray Observatory (GRO) were not yet available at this conference, as its satellite had only recently been launched at the time of the meeting.

Other outstanding features of the book are a truly excellent review of the dark matter problem by Sadoulet and good overviews of galaxy formation and large-scale structure by White, Davis, Rocca-Volmerange, Maddox, Bernardeau, Lukash, and Yahil. There are also good papers describing the current status of faint galaxy counts at various wavelengths by Guhathakurta, Gardner, Millard *et al.*, Madejsky, Guideroni, and Carlberg, as well as discussions of the ultraviolet, visible, and near-infrared background by Bowyer, Jakobsen, Sciama, Mattila, and Leinert *et al.* The book concludes with a group of papers describing prospects for future observations, which would be useful to anyone entering the field. There are enough general overview papers to bring the uninitiated reader up to speed on the subject as well as enough material of a more technical nature to provide a summary of the state of the art.

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The Smectic C* Phase

Ferroelectric Liquid Crystals. Principles, Properties, and Applications. J. W. GOODBY, ROBERT BLINC, NOEL A. CLARK, SVEN T. LAGERWALL, M. A. OSIPOV, S. A. PIKIN, TAKAO SAKURAI, KATSUMI YOSHINO, and BOŠTJAN ŽEKŠ. Gordon and Breach, Philadelphia, 1991. xii, 474 pp., illus. \$70. Ferroelectricity and Related Phenomena, vol. 7.

The smectic C* phase of liquid crystals exhibits a permanent polarization in each smectic layer that changes orientation in a helical direction with each successive layer. Because of its electric properties, which are unusual for a liquid phase, it has been the subject of growing interest since its theoretical prediction in 1974 by Meyer and its synthesis in 1975 by Liébert, Strzelecki, and Keller. The ferroelectric-like property of the crystal is obtained when the helix is destroyed by external fields or by surface effects. Such a structure is much more complicated than the twisted nematic liquid crystals currently used in most device applications, and the promise of the smectic C* phase lies in its ability to allow for devices that operate on a much faster time scale (micro- instead of milliseconds), such as flat-screen televisions. These include not only

display devices (such as the surface-stabilized ferroelectric liquid crystal device, or SSFLC, invented by Clark and Lagerwall) but various kinds of optoelectrical devices, switches, and shutters now undergoing testing.

Ferroelectric Liquid Crystals is intended to guide the reader through the basic physics and chemistry of the smectic C* phase to the rather complicated structures and experimentation currently used in the development of applications. The contributions to the book, which consists of six sections mainly with different authorship, have three basic themes (although they are not organized this way): the physics of the phase itself and its applications (described in two sections by Clark and Lagerwall), the chemistry in relation to physical properties (discussed in detail by Goodby and in more general terms by Yoshino and Sakurai), and some theoretical issues (treated briefly in the sections by Pikin and Osipov and by Žekš and Blinc).

In their introduction to the physics of the smectic C* phase and to SSFLCs, Clark and Lagerwall focus on simple concepts (such as the Ginzburg-Landau description) and models (such as molecular models relating tilt angle to polarization) rather than attempt mathematical rigor. They begin with the fundamental properties of the smectic C and the chiral C* phase, including their general electric behavior, and then narrow their discussion to SSFLCs, a focus of their research, providing a (somewhat shortcut) review of the history of the subject and an extended exposition of the complicated local structures in SSFLC cells. The discussion covers the layer structures and the optical and electro-optical properties of the cells. Possible applications and questions of practical concern such as matrix addressing, wave-form influence, gray scale, and colors are discussed in their second section (though developments later than 1988 are not covered). In addition, the electroclinic effect in the smectic A phase of the chiral molecules, which has recently attracted new interest, is treated briefly.

The section by Goodby on the microscopic aspects and chemistry of the smectic C* and related phases has the character of a monograph. It does not deal at all with the synthesis of the molecules but explains in a comprehensive and self-contained way what is known about the relationship between the chemical composition and the physical properties of the phases. Goodby takes a rather critical approach and not only gives the rules of thumb but discusses the exceptions to them. He also provides an introduction to the phase behavior of liquid crystals in general, though only chiral smectic phases are discussed in detail, and an analysis of the sometimes misleading nomenclature used in

the field (such as the word "ferroelectric" itself). The structures of various chemical moieties that can give rise to chiral smectic phases are also covered. These are contrasted and related to the macroscopic properties of the phase, with special emphasis on optical (optical activity, twist sense, birefringence, and optical tilt) and electrical properties (polarization and its magnitude, sign, and temperature dependence). Goodby concludes his section with chapters on peculiarities of mixtures, which are important to applications, and the identification and alignment (orientation) of a chiral smectic phase, which are prerequisite to any investigation. Without doubt, this part of the book fulfills the interdisciplinary requirements of the field well and with its extensive tables and figures will also serve as a reference for those working on applications. The information here is augmented in the section by Yoshino and Sakurai, who provide data on phase sequences, transition temperatures, and some electrical properties of various chemical compounds.

Two sections on the theory of chiral phases (Pikin and Osipov on the general theory and Žekš and Blinc on the effect of electrical and magnetic fields) are disappointing. On the phenomenological level they focus exclusively on the Ginzburg-Landau approach, which is described elsewhere in the book, and ignore any other type of description, and they essentially reproduce older papers by the authors without any noticeable attempt to adapt them for a broader readership. The microscopic aspects are described in one of Pikin and Osipov's chapters by using the statistical mechanics approach developed mainly by the Dutch school. It conveys the (correct) impression that there is still no realistic microscopic model that can accurately reproduce all the electrical properties of the chiral phase. Here the citation is out of sequence and some references are never cited in the text.

Overall, this book serves its intended purpose (with some restrictions on the theoretical side). It reflects the state of the art as of 1990 and focuses on classical smectic C* phases without digressing too much into more exotic phases or polymeric systems.

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Books Received

AIDS and Accusation. Haiti and the Geography of Blame. Paul Farmer. University of California Press, Berkeley, 1992. xiv, 339 pp. \$35. Comparative Studies of Health Systems and Medical Care, vol. 33.

AIDS and Other Manifestations of HIV Infection. Gary P. Wormser, Ed. 2nd ed. Raven, New York, 1992.

xxiv, 715 pp., illus. \$130.

AIDS and Women's Reproductive Health. Lincoln C. Chen et al., Eds. Plenum, New York, 1992. viii, 208 pp. \$65. Reproductive Biology. From a workshop, Bellagio, Italy, Oct. 1990.

AIDS in the Industrialized Democracies. Passions, Politics, and Policies. David L. Kirp and Ronald Bayer, Eds. Rutgers University Press, New Brunswick, NJ, 1992. xiv, 393 pp., illus. \$45; paper, \$16.

AIDS Research in the Netherlands. Published for the Dutch Program Committee for AIDS Research by Amsterdam University Press, Amsterdam, 1992. viii, 213 pp., illus. Paper. Prepared for distribution at the eighth international AIDS conference. Describes the programs of some 20 Dutch institutions.

Alexanderson. Pioneer in American Electrical Engineering. James E. Brittain. Johns Hopkins University Press, Baltimore, MD, 1992. xviii, 384 pp., illus. \$45. Johns Hopkins Studies in the History of Technology.

Amazon Healer. The Life and Times of an Urban Shaman. Marlene Dobkin de Rios. Unity, Lindfield, Australia, and Prism, Bridport, U.K., 1992 (U.S. distributor, Avery, Garden City Park, NY). viii, 180 pp., illus. Paper, \$10.95.

Biological Effects of Static Magnetic Fields. A Review. Nancy J. Simon. International Cryogenic Materials Commission, Boulder, CO, 1992. x, 284 pp., illus. Paper, \$50.

The Biomarker Guide. Interpreting Molecular Fossils in Petroleum and Ancient Sediments. Kenneth E. Peters and J. Michael Moldovan. Prentice-Hall, Englewood Cliffs, NJ, 1992. xvi, 363 pp., illus. \$56.

Biomarkers. Biochemical, Physiological, and Histological Markers of Anthropogenic Stress. Robert J. Huggett et al., Eds. Lewis, Chelsea, MI, 1992. xviii, 347 pp., illus. \$69.95. Society of Environmental Toxicology and Chemistry Publications Series. From a workshop, Keystone, CO, July 1989.

Biomembrane Structure and Function. The State of the Art. Bruce P. Gaber and K. R. K. Easwaran, Eds. Adenine Press, Schenectady, NY, 1992. x, 386 pp., illus. \$95. From a workshop, Bangalore and Hyderabad, India, Jan. 1991.

Biotechnology: Economic and Social Aspects. Issues for Developing Countries. E. J. Da Silva, C. Ratledge, and A. Sasson, Eds. Cambridge University Press, New York, 1992. ix, 388 pp., illus. \$90.

The BIRPS Atlas. Deep Seismic Reflection Profiles around the British Isles. Simon Klemperer and Richard Hobbs. Cambridge University Press, New York, 1992. iv, 124 pp., illus., + maps, boxed. \$150.

Coastal Dunes. Geomorphology, Ecology and Management for Conservation. R. W. G. Carter, T. G. F. Curtis, and M. J. Sheehy-Skeffington, Eds. Balkema, Brookfield, VT, 1992. xii, 533 pp., illus. \$90. From a congress, Galway, Ireland, June 1992.

Codes of Evolution. The Synaptic Language Explaining Matter, Life, and the Thought Process. Rush W. Dozier, Jr. Crown, New York, 1992. viii, 282 pp., illus. \$20.

Combining Information. Statistical Issues and Opportunities for Research. Commission on Physical Sciences, Mathematics and Applications. National Academy Press, Washington, DC, 1992. xii, 217 pp., illus. Paper, \$28.

Comparable Worth. Theories and Evidence. Paula England. Aldine de Gruyter, Hawthorne, NY, 1992. xii, 346 pp., illus. \$46.95; paper, \$22.95. Social Institutions and Social Change.

Computer Assisted Modeling on the IBM 3090. The 1989 IBM Contest Prize Papers. Keith R. Billingsley, Hilton U. Brown, III, and Ed Derohanes, Eds. Baldwin Press, University of Georgia, Athens, 1992. 2 vols. xxiv, 980 pp., illus. Paper, \$77.

The Concept of Function. Aspects of Epistemology and Pedagogy. Ed Dubinsky and Guershon Harel, Eds. Mathematical Association of America, Washington, DC, 1992. xiv, 333 pp., illus. Paper, \$22. MAA Notes, vol. 25. Based on a conference, West Lafayette, IN, Oct. 1990.

Electromagnetic Instabilities in an Inhomogeneous Plasma. A. B. Mikhailovskii. Institute of Physics, Philadelphia, PA, 1992 (distributor, American Institute of Physics, New York). xx, 298 pp., \$110. Plasma Physics Series. Translated from the Russian by E. W. Laing.

Environmental Neurotoxicology. Committee on