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.

Peter Conrad
Department of Sociology,
Brandeis University,
Waltham, MA 02254–9110

■

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 intriguing science. The various backgrounds discussed in this compendium include a variety of energetic domains, from the coldest 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 Burdyuzha *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 deg^2. 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.

Grant J. Mathews
Lawrence Livermore National Laboratories,
Livermore, CA 94550

■

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