

construction of fancy observatories, chiding them that "[a] great telescope is of no use without a man at the end of it" (p. 195). Using democratic rhetoric to achieve secure professional surroundings for himself and fellow scientists was, as Newcomb discovered, a tricky business. Moyer's focused, well-researched account of Newcomb's rhetorical tricks and intellectual accomplishments provides a welcome assessment of an important historical figure. It also suggests fruitful directions for investigating the problems and successes experienced when a scientific community presents its public face.

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Medicalizations

Framing Disease. Studies in Cultural History. CHARLES E. ROSENBERG and JANET GOLDEN, Eds. Rutgers University Press, New Brunswick, NJ, 1992. xxvi, 326 pp. \$48; paper, \$16. Health and Medicine in American Society. Based on a conference, Philadelphia, 1988.

Over the past two decades social scientists have liberated their analyses from the dominance of the medical paradigm in the understanding of disease. Now they consider disease as a social as well as biomedical phenomenon and investigate how conditions become identified and designated as diseases. Sociologists have called this the social construction of illness; in this volume medical historian Charles Rosenberg and the contributors eschew constructionist language and focus on how disease is "framed." The differences in terminology probably don't matter; the important idea is that disease designations have histories that reflect not only biological phenomena but the social and cultural context in which they are identified.

As Rosenberg notes in his fine introduction, "In our culture a disease does not exist as a social phenomenon until we agree that it does—until it is named." This view, which has been developed by such analysts as Gusfield, Freidson, and Foucault, has been more boldly stated by Peter Sedgwick: "Outside of the significances that man [*sic*] voluntarily attaches to certain conditions, *there are no illnesses or diseases in nature.*" There are of course naturally occurring phenomena that affect biological functioning, including viruses, malignant growths, and unusual genetic constellations, but these are not *ipso facto* diseases. Illness and disease are human constructions; they do not exist without someone proposing, de-

scribing, and recognizing them as such.

That diseases are shaped, packaged, and sometimes transformed by the process of discovery can be exemplified by the case of renal failure. In his contribution to the volume Steven J. Peitzman traces how the transformation of the 19th-century symptoms of "dropsy" into Bright's disease and then, most recently, into end-stage renal disease (ESRD) represents changes in the medical conception of the disease and the experience of the illness. With the introduction of dialysis, "renal failure" has become a chronic disease (ESRD) whose main experience is that of dialysis. Kidney function fails in the same way today as a century ago, but the way we frame the failure and the manner in which we can treat it make it a markedly different disease from that depicted as dropsy.

Nowhere is the validity of Sedgwick's dictum and Rosenberg's insight more apparent than in examples of what has been called "the medicalization of deviance": the framing of certain human problems or conditions in medical terms. More than a third of the 14 essays in this volume reflect on this issue in some manner. Michael MacDonald shows how the categorization of suicide as a medical matter in England (1500–1870) resulted more from social changes and lay initiatives than from expansion of medical expertise. Social responses to suicide were secularized in the 18th century owing to a general loss of confidence in diabolical powers; physicians had little to do with this, and MacDonald suggests that suicide was more or less medicalized by default. Ordinary Englishmen preferred to label suicide as sick rather than as criminal according to the once-common definition, since an illness designation was more likely to protect a family's property inheritance. Bert Hansen focuses on a much narrower period (1880–1900) in his examination of an important set of medical writings on "sexual inversion." By examining all published case reports in the United States, he illustrates the "discovery" of the new disease of sexual inversion (later called homosexuality). As these medicalized designations of behavior entered the public discourse, they depicted people who engaged in sexual behavior with members of the same sex not only as sick but as fundamentally different from heterosexuals. According to Hansen, certain individuals found some comfort (and reduced sense of guilt) in seeing that their needs and actions were not their fault, but the designation framed same-sex behavior as a pathology that resulted from faulty heredity. The evidence for disease was for the most part no more than a frame, and the gay liberation movement challenged that frame and achieved a kind of official demedicalization in the 1970s. Recent medical reports again raise the specter of medicalizing homosexuality, again with a

mixed response from the gay and lesbian activists who understand that the framing of homosexuality as a disease has significant social consequences.

Anorexia nervosa and "chronic fatigue syndrome" can be called diseases of the 1980s. Both disorders have emerged from relative obscurity to become subjects of common knowledge and, interestingly, seem to affect mostly middle-class individuals. In most ways, of course, they are quite different, with anorexia reaching nearly epidemic status in some quarters and chronic fatigue syndrome remaining controversial even in the medical world.

Eating disorders, from obesity to extreme fasting and self-starvation, have become increasingly medicalized. Joan Jacobs Brumberg, author of a recent enlightening history of anorexia, presents a provocative analysis suggesting that in two decades anorexia has shifted from being a psychiatric syndrome to being a "communicable disease." She shows how knowledge of the illness has permeated the culture and argues that this has had significant consequences. She relates the spread of anorexia to its cultural availability. This is of course a different kind of "communicability" from that which we are accustomed to thinking about, but Brumberg contends that anorexia has become a social option, conscious or not, available to predisposed individuals. If Brumberg is correct, the dispersion of knowledge about anorexia has contributed significantly to the spread of the disorder.

Robert A. Aronowitz chronicles the debates over chronic fatigue syndrome—is it a somatic entity or a medicalized label for some vague ills? Aronowitz highlights the tensions and contradictions between lay and medical views over who has the authority to define the disease. Sufferers claim the syndrome is a real disease; medical skeptics abound. This raises issues of the legitimacy of patient experience and provides an interesting comparison for other controversial diseases like hypoglycemia.

The consequences of particular framings of disease are seen in a number of chapters, but perhaps most clearly in Ellen Dwyer's presentation of how the physicians' views of epilepsy in the late 19th century medicalized the disorder but characterized epileptics as weak-willed, defective, and prone to crime and madness. Physicians so incorporated the generally negative societal view of epilepsy that medicalization did not appear to reduce the historic stigma. The medical frame of epilepsy as a disease of "moral and physical degenerates" led to social policies including limiting immigration, sterilization, and institutionalization in colonies. In the 1920s, with the introduction of new medications that made the condition more manageable, medical writings became less negative. But it has

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