fascinating history, part of which took place in exotic lands and includes the rather unusual practice of cannibalism. Prion diseases also have a peculiar and disturbing way of affecting humans and animals, which occasionally results in threats, real or imaginary, of leaping the species barrier and spreading uncontrollably among us. Finally, being such, prion diseases could not fail to involve politicians, the media, and the general public, as they have recently done, and with considerable controversy, in the United Kingdom and continental Europe.

In spite of this extensive history, the causative mechanism of prion diseases remains controversial. Recently, the upper hand has been gained by the "protein-only" or prion hypothesis, according to which the agent responsible for the pathogenesis and transmission of these diseases is exclusively a protein and the "instructions" for the causation of the disease are contained in the secondary or tertiary protein structure. Like many other revolutionary ideas, this one was considered heresy by the scientific establishment when it was first proposed. An opposite theory is championed by a small but vocal group of scientists who maintain that the information is specifically encoded in nucleic acid. According to this second view, the causative agent of prion diseases has the basic structure of a virus, that is, a protein with a nucleic acid core or "a piece of bad news enwrapped in a protein," according to one definition.

Prion Diseases deals with several of these issues in an informative, concise, and entertaining way. Several of the chapters are authored by investigators who have been at the center of events in the history of prion diseases, such as the 1986 epidemic of bovine spongiform encephalopathy (BSE) in the United Kingdom. This makes for a lively and direct narration.

The introductory chapter deals with issues rarely covered in other reviews, such as the reaction of the general public to the "bizarreness" of prion diseases. The paradoxes that the diseases present and the evidence in favor of the viral and of the protein-only hypotheses are reviewed sensibly and objectively. This chapter succeeds in putting prion diseases into the proper perspective.

The two chapters on surveillance and environmental causes of human prion diseases as well as the two dealing directly with BSE are especially timely and useful. They provide information and food for thought that are badly needed by countries, including the United States, that must strengthen their surveillance systems for human and animal prion diseases. The account of the early response to the BSE epidemic in the United Kingdom is inspirational, providing an engaging narrative of how the mystery of the first outbreak of the disease in the United Kingdom was solved in record time by a small group of scientists with the support of responsive politicians and bureaucrats. This was another of Britain's finest hours in which much was owed by many to few.

Clinical, neuropathological, immunohistochemical, and ultrastructural techniques relevant to human and animal prion diseases are presented in five chapters. The remaining eight chapters deal with techniques of prion inactivation, scrapie susceptibility, prion "strains," transmissibility in knock-out and transgenic mice, and methods for studying normal as well as protease-resistant prion protein, including prion protein amyloid. The general quality of these chapters is good. Some provide critical discussion that will be of unquestionable use to those who wish to pursue similar experiments. In a few, the methods are unfortunately presented in cookbook style.

Sadly, the presentation of diagnostic methods does not do justice to the usefulness of the immunoblot in the detection and characterization of prion diseases, and the protocol given is outdated. The simpler and more sensitive methods of prion-protein detection used in human tissues should be also applied to diagnosis in animals.

Glaring errors, if present, were missed by this reviewer, except, of course, for the incorrect genotype ascribed to fatal familial insomnia and familial Creutzfeldt-Jakob disease with mutation on codon 178 of the prion protein gene.

This is a commendable book for those, scientists and non, who wish to learn about methods in the study of prion diseases, the current status of the prion and viral hypotheses, and, perhaps most important, how a responsible country should deal with the threat posed by these diseases.

Pierluigi Gambetti
Institute of Pathology,
Case Western Reserve University,
Cleveland, OH 44106, USA

■

More on Prions

Prions Prions Prions. S. B. PRUSINER, Ed. Springer-Verlag, New York, 1996. viii, 163 pp., illus. $129, £78.50, DM 168, or FF633. Current Topics in Microbiology and Immunology, 207.

In this slim volume Stanley Prusiner (who also contributes a foreword to *Prion Diseases*, reviewed above) brings together nine papers on the pathogens named in the title. Prusiner's introduction and the two opening chapters, by Gambetti and by Kitamoto and Tateishi, are concerned mainly with diseases of humans, Gambetti dealing specifically with fatal familial insomnia and familial Creutzfeldt-Jakob disease, "two diseases with the same genetic mutation." Prion strains are reviewed by Carlson, Huang *et al.* and Safar consider the relation of prion protein conformation to disease, and Harris *et al.* discuss the cell biology of the protein. Two papers, by Scott *et al.* and by DeArmond and Prusiner, are devoted to the use of transgenic mice in prion research, and the volume concludes with an account by Wickner and Masison of evidence for the existence of prions in a nonmammalian organism (yeast).

Katherine Livingston

■

Books Received

Advanced Electromagnetism. Foundations, Theory and Applications. Terence W. Barrett and Dale M. Grimes, Eds. World Scientific, River Edge, NJ, 1995. xiv, 791 pp., illus. $124.

Binocular Vision and Stereopsis. Ian P. Howard and Brian J. Rogers. Clarendon (Oxford University Press), New York, 1996. x, 736 pp., illus., + plates + stereopticon. $125. Oxford Psychology, no. 29.

Chemical Water Treatment. Principles and Practice. Henri Roques, Ed. VCH, New York, 1995. xiv, 620 pp., illus. $165. Translated from French edition (Paris) by Scott Altmann.

Creatures of the Dark. The Nocturnal Prosimians. L. Alterman, Gerald A. Doyle, and M. Kay Izard, Eds. Plenum, New York, 1995. xiv, 571 pp., illus. $125. From a conference, Durham, NC, June 1993.

Force-Free Magnetic Fields. Solutions, Topology and Applications. Gerald E. Marsh. World Scientific, River Edge, NJ, 1996. x, 157 pp., illus. $38.

The History of Mental Symptoms. Descriptive Psychopathology Since the Nineteenth Century. German E. Berrios. Cambridge University Press, New York, 1996. xvi, 565 pp. $135; paper, $59.95.

Liquid-Liquid Systems. N. N. Kulov, Ed. Nova, Commack, NY, 1996. vi, 270 pp., illus. $98.

Metamorphosis. Postembryonic Reprogramming of Gene Expression in Amphibian and Insect Cells. Lawrence I. Gilbert, Jamshed R. Tata, and Burr G. Atkinson, Eds. Academic Press, San Diego, 1996. xvi, 687 pp., illus. $125. Cell Biology.

Neotropical Birds. Ecology and Conservation. Douglas F. Stotz *et al.* University of Chicago Press, Chicago, 1996. xx, 482 pp., illus., + plates. $100 or £79.95; paper, $37.50 or £29.95.

Photoinduced Defects in Semiconductors. David Redfield and Richard H. Bube. Cambridge University Press, New York, 1996. x, 217 pp., illus. $54.95. Cambridge Studies in Semiconductor Physics and Microelectronic Engineering, 4.

The Quantum Dice. An Introduction to Stochastic Electrodynamics. Luis de la Peña and Ana María Cetto. Kluwer, Norwell, MA, 1995. xvi, 509 pp. $224 or £144 or Dfl. 320. Fundamental Theories of Physics, vol. 75.

Reconstructing Biology. Genetics and Ecology in the New World Order. John Vandermeer. Wiley, New York, 1996. xviii, 478 pp. Paper, $34.95.

Science of Fullerenes and Carbon Nanotubes. M. S. Dresselhaus, G. Dresselhaus, and P. C. Eklund. Academic Press, San Diego, 1996. xviii, 965 pp., illus. $130.

Time's Arrow and Archimedes' Point. New Directions for the Physics of Time. Huw Price. Oxford University Press, New York, 1996. xiv, 306 pp., illus. $25.

Waves in Astrophysics. J. H. Hunter, Jr., and R. E. Wilson, Eds. New York Academy of Sciences, New York, 1995. viii, 345 pp., illus. $80. Annals, vol. 773. From a conference, Gainesville, FL, Sept. 1994.