(BSE) of domesticated herbivores). Considering that more than half of the 17 chapters are actually co-authored by Prusiner, this is the closest yet to a monograph from his laboratory. And, it has to be admitted, the book is by far the most authoritative introduction and summary of the complex data that form the basis of our understanding of the molecular basis of this esoteric group of diseases. While the human forms of the diseases are rare, their economic impact, particularly in the United Kingdom, has been profound. Moreover, their occurrence is now threatening the normal operation of blood-transfusion services worldwide. Hence the need for such an authoritative book.

The prion field has been dogged by controversy, apparently the result of the long time it takes to generate reproducible scientific data, given incubation periods that can exceed 40 years. The discovery of the prion protein (designated PrP^{Sc}) in 1982 as the principal component of the infectious particle revolutionized and galvanized investigators. Prusiner recounts the background to this, and takes us through the following critical decade in which the surrogate properties of PrP^{Sc} (insolubility, resistance to proteolysis, increased β -sheet content, polymerization into amyloid fibrils) are elucidated. A certain obfuscation remains over the issue of prion rods and amyloid filaments; since the minimal infectious unit has still not been defined, and because it appears that neither rods nor filaments are required for infectivity, this issue seems to be related to attribution of discovery.

While Prusiner and his collaborators have driven the research agenda of the molecular basis of PrP infectivity, other independent groups have complemented his efforts. The nature of infectivity has been uncovered largely through the application of transgenesis to mice, including ablation studies that prove beyond reasonable doubt that PrP plays the central role in prionogenesis. Interestingly, the recent discovery of a duplicated homologue of PrP may necessitate some re-interpretation of these knockout studies, although leaving the central hypothesis intact. Studies in yeast by Reed Wickner and colleagues show that accessory chaperones (possibly the postulated 'protein X' of mammalian prions) may facilitate the conversion of a normal host-cell protein into a pathogen. Many enigmas remain: the topology of PrP in the cell membrane, the mechanisms underlying nerve-cell degeneration, the partial creation of *de novo* infectivity in overexpressing mutant PrP in mice, and the failure yet to create infectivity *in vitro*.

The emergence of BSE and then the threat of an epidemic in humans caused by contamination of the food chain has assured the future of intensive research of these diseases. The book closes with several helpful practi-

cal chapters on methodologies (including insights into future therapeutic strategies), antibody probes (which may prove essential for future clinical tests) and biosafety issues. The latter area is now of immediate concern, since the general levels of ignorance about the spread of CJD and BSE cause regulatory authorities to respond by containing the worst-case scenario, often with drastic financial implications.

Overall, the volume is virtually a monograph by Prusiner, and as such presents a

very unified picture of the current state of research. It is the best comprehensive overview of this field and is an ideal introduction for anyone wishing to launch a career in prionology. Perhaps the major message would be that Prusiner achieved his successes through outstanding collaborators, most of whom are represented in the book. ■

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Science in culture

The Brain

A theatre show from Forkbeard Fantasy which will be touring Britain from 6 December and throughout much of next year
Bonnie Hurren & Robert Meech
Making sense of *The Brain*, an experimental performance from Forkbeard Fantasy, is like trying to make sense of the brain itself. Ronald C. James's well-known photograph of a Dalmatian dog against a dappled background reminds us just how easily the brain finds order in a random world. In the world of Forkbeard Fantasy, on the other hand, anarchy is created effortlessly out of a high degree of order. The technical skill required to mount this mixed-media performance is immense. Video machines, film projectors, neon lights, music, an 'intelligent' lighting system, automated smoke machines (to create a sensation of smell) all work seamlessly to give the illusion of chaos.

The Brain was funded in part by an award from the Wellcome Trust's Science on Stage and Screen competition. The nine winners of this, the first year of the competition, each received up to £36,000 (US\$56,500) to develop a production illuminating some aspect of medical science. *The Brain* was written and directed by Paul B. Davies, who has had considerable success on the Edinburgh Fringe — the offbeat offshoot of Britain's major arts festival — as well as on radio.

"Logical thought has no vantage point from which to observe its own workings," according to Davies in his programme notes, "but the imagination can propel the mind outside itself. ... *The Brain* is one such acrobatic enterprise and although we can't pretend that it contains much real science, ... modern scientific knowledge about the brain is the springboard from which we have launched it."

The one cerebral moment in all the confusion is when Emil Toescu of Birmingham University (billed as neuroscience adviser to Forkbeard Fantasy) appears on screen as a talking head to explain the neurophysiological basis of the sense of smell. He ends with a good joke, one of many good jokes during this 90-minute production. Look out for the one about that Dalmatian dog.

But for all the chaos, there are themes. Smell is important in the narrative, as are bees and phantom limbs. And behind all the fantasy there are important points about common oversimplifications made in the name of making science entertaining. Forkbeard use ridicule as a powerful weapon: how do you cure someone with a phantom limb? Answer: cut his head off.

Much intelligence and wit have gone into the production. Most of the ideas are well integrated but a few seem shoehorned into place, which makes for a disjointed narrative. But then narrative is the last thing on Forkbeard's mind.

Forkbeard acknowledge works by Richard Gregory, Rita Carter, Susan Greenfield, V. S. Ramachandran, Sandra Blakeslee, Marcel Proust and the children's comic *The Beezer*. ■
Bonnie Hurren is a freelance actor and director, c/o Bristol Old Vic Theatre School, 2 Downside Road, Clifton, Bristol BS8 2XF, UK. Robert Meech is in the Department of Physiology, University of Bristol, University Walk, Bristol BS8 1TD, UK. The Brain will have its final venue at the Natural History Museum, London, between 16 and 30 September 2000. For performance details write to Forkbeard, PO Box 1241, Bristol BS99 2TG, UK. It is suitable for sophisticates seeking to nourish their inner child.