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John Grahame

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Elizabeth Wood

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### Edward Arnold

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and Arnold (and also of Moser in the West) on the stability of the Solar System, of Sinai, Alexeev and Pesin on fully chaotic motion, and of Chirikov on criteria for chaos in accelerators and plasmas, barely rate a mention. This amounts to a reconstruction of history worthy of the Kremlin in the days before *glasnost*. It is hard to fathom the reason, especially as a reading between the lines makes it appear that many of those whom the author interviewed must have fully and generously acknowledged their indebtedness to colleagues from the East. I can only guess that the width of the Atlantic, the height of the Iron Curtain and the terseness of some Soviet scientific writing combined to hide the fact that Russians have personalities too — and in this style of writing a lack of 'human interest' seems to mean no interest at all.

Apart from this unpleasant chauvinism there are a few minor errors. Friction is confused with nonlinearity, and there is the curious assertion that "Physicists had theorems, mathematicians had conjectures". In the main, however, the explanations are clear and accurate, and the intensely visual appeal of the subject is reflected in diagrams and colour plates. There is a useful bibliography to guide those who wish to dig deeper.

On balance I recommend this book as a lively introduction, conveying to non-specialists the intellectual excitement accompanying these new insights into the relation between the simplicity of the laws of nature and the complexity of the world as it is. □

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## A massive problem

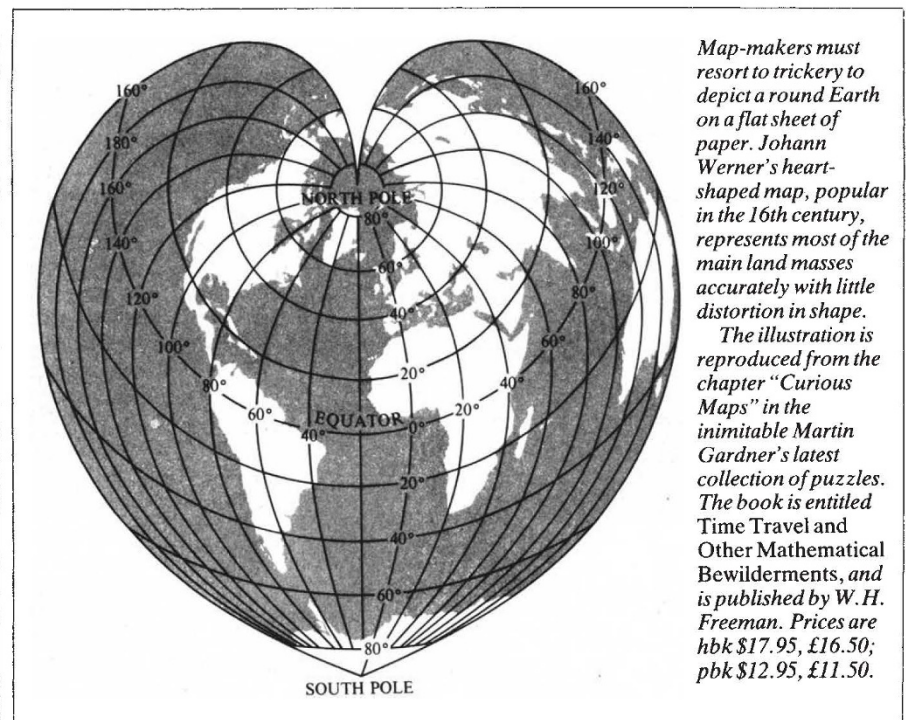
Robert H. Sanders

**The Omega Point: The Search for the Missing Mass and the Ultimate Fate of the Universe.** By John Gribbin. *Heinemann: 1987. Pp. 245. £12.95. To be published in the US in January by Bantam, pbk \$9.95.*

THERE are a number of compelling reasons for believing that the Universe can be described by the flat space Friedman solution to Einstein's field equations. This requires that the average density of matter in the Universe should be very nearly equal to a critical value; in other words, that the density in terms of this critical density, designated "omega", should be unity to high precision.

In this highly readable book, John Gribbin reviews theoretical and philosophical arguments in favour of  $\Omega=1$  for the non-specialist, and the efforts by astronomers, cosmologists and particle physicists to solve the omega problem — the question of whether the Universe is open and will expand forever or is closed and will eventually recollapse.

Gribbin argues convincingly that the only natural value of  $\Omega$  in the standard cosmological models is unity; the work on quantum gravity by Stephen Hawking provides a theoretical basis for expecting  $\Omega$  to be very nearly unity as an initial condition, and modern theories of the unification of forces provide a mechanism, "inflation", for smoothing and flattening the Universe. He goes on to stress that if we accept that  $\Omega$  is unity, then astronomical observations are telling us that



*Map-makers must resort to trickery to depict a round Earth on a flat sheet of paper. Johann Werner's heart-shaped map, popular in the 16th century, represents most of the main land masses accurately with little distortion in shape.*

*The illustration is reproduced from the chapter "Curious Maps" in the inimitable Martin Gardner's latest collection of puzzles. The book is entitled Time Travel and Other Mathematical Bewilderments, and is published by W.H. Freeman. Prices are hbk \$17.95, £16.50; pbk \$12.95, £11.50.*



most of the mass of the Universe should be non-luminous matter. The visible matter in galaxies accounts for less than 1 per cent of the critical density. The greatest predictive success of the standard Big Bang cosmology, the nucleosynthesis of the light elements, implies the density in ordinary baryonic matter could be at most about 10 per cent of the critical density. Thus the dark matter must be non-baryonic and may consist of one of the undiscovered particles predicted by unification theories such as supersymmetry.

Up to this point the discussion is logical and persuasive. Gribbin succeeds in convincing the reader that, in the context of modern cosmological theory, the *a priori* arguments for  $\Omega=1$  are overwhelming. However, when it comes to the empirical evidence for  $\Omega=1$  he gives the impression that astronomers have all but wrapped up the case in favour of a flat space Universe. The fact is that, in spite of all the hopes for  $\Omega=1$ , the astronomical evidence is far from clear cut. In gravitationally bound systems — from single galaxies to rich clusters of galaxies — there is no indication that the dynamically measured mass is much more than ten times the visible mass. This is completely consistent with all dark matter being in baryons and with  $\Omega \approx 0.1$ . It is possible, as the author notes, that the dark matter is spread much more evenly throughout space than the visible matter (a result of “biased” galaxy formation), but the recently discovered large-scale streaming motions in the Universe are not consistent with this idea.

In his enthusiasm Gribbin goes further and practically certifies WIMPS — weakly interacting massive particles — as the dark matter closing the Universe. The principal evidence given for this is the suggestion that the presence of such particles in the Sun can account for the anomalously low detection rate of solar neutrinos. Although this is an intriguing possibility, there remain outstanding theoretical and observational objections. This is only one example of the essential shortcoming of the book: ideas or suggestions that are only tentative are presented as firmly established and all but proven.

In a popular account of a rapidly developing field, an optimistic and enthusiastic style is justified by the need to convey the excitement of research at the frontier. But the sense of excitement should not be achieved at the expense of accuracy. The work described here is a great story of human enquiry into some of the most fundamental questions in science. It is intrinsically exciting, not only because of the puzzles that have been solved, but also because of those that remain. It is a mistake to exaggerate the successes and downgrade the mysteries. □

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## Seeking asylum

Michael Shepherd

**A Social History of Madness: Stories of the Insane.** By Roy Porter. Weidenfeld & Nicolson: 1987. Pp. 261. £14.95.

A PROMINENT medical historian has pointed out that

Until relatively recently, the history of psychiatry continued to be written primarily by practising psychiatrists, and reflected to a large extent the professional preoccupations of its authors. . . . Increasingly, however, the history of psychiatry has not been the exclusive domain of the psychiatrist, as social, intellectual and legal historians, sociologists, criminologists, anthropologists, philosophers and historians of medicine, among others, have examined many cultural and historical aspects of mental disorders [W.F. Bynum, in his contribution to *Handbook of Psychiatry*, Vol. 1; Cambridge University Press, 1983].

As might be expected, many of these newcomers bring a very different perspective to bear on the field, often deriving



Inner visions — power, art and religion represented by George III, Nijinsky and Cowper.

their inspiration from Michel Foucault's seminal volume, *Madness and Civilisation*, which goes some way towards challenging the legitimacy of the whole medico-psychiatric enterprise. As one of them, C. Unsworth, has remarked:

Psychiatric history looks different if psychiatric medicine's status as a science is not assumed, but treated as a product of historical development, with focus upon the historical contingency of psychiatric ascendancy, the structure of psychiatric discourse, the strategies of the medical profession in laying claim to the psychiatric territory, and the specific contribution of the psychiatric apparatuses and practices to the perpetuation and development of socio-political orders [*The Politics of Mental Health Legislation*; Clarendon, 1987].

Roy Porter, a practised and knowledgeable social historian, exemplifies the outlook in this book. He presents the thoughts and feelings of some two dozen individuals regarded as insane at various times, drawing principally on their autobiographical writings supplemented by literary and historical sources for the

purpose. The bulk of the volume, accordingly, consists of the presentation of a series of biographical sketches of mad people, some world-famous and others obscure. These are related, chapter by chapter, to several broad topics — power (George III, Christian VII, James Tilley Matthews), artistic genius (Robert Schumann, Vaslav Nijinsky, John Clare), religion (William Cowper, George Trosse, Christoph Hartzmann) and so on. Much of the material is familiar but the text reads trippingly and an appendix of annotated suggestions for further reading indicates the extensive background from which the information has been drawn.

The author's declared intention — “simply and quite literally to see what they had to say” — is, however, economical with the truth. In his opening chapter, “Madness and Psychiatry Talking” he reveals the underlying relativism of his approach, contending that the madman's eye-view of his own language, metaphor and culture makes its own sense, and that “madness may have moved towards psychiatry . . . we may be witnessing yet

another mode of folie à deux, madness and psychiatry as doubles”.

This theme is most clearly illustrated in the penultimate chapter, entitled “The Therapeutic God”, which refers to four individuals. Three of these are Sylvia Plath, John Butt and one of Sigmund Freud's best known cases, the so-called ‘Wolf-Man’. The fourth is Freud himself, whom Dr Porter puts alongside his other subjects as “one who underwent a mental disturbance and who subsequently told his life story”. The boundaries between doctor and patient, between reason and unreason, are blurred by the portrait of a straw man: the founder of psychoanalysis represents the thaumaturgy not the science of the psychiatric tradition. Medical history, as Henry Sigerist always insisted, is not only history but medicine as well. And psychiatry is part of medicine. □

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