

history which provided a handle for Hitler. Fear of the Left, which threatened personal wealth, had long been a leading player at the American table. When Novikov joined it, Hitler had a vocal and influential fan club both in Britain and the United States. Suddenly the game was transformed and the Soviets became allies. The Bomb then restored the ability of the American Right to sleep soundly at night, but — hey presto! — the savage Communists had one too, and domestic traitors had helped them get it. Fear created as a political instrument turned to paranoia, and it took some years for the Constitution to regain its authority.

It is this background in American self-perception that lies behind the more parochial events documented by Holmes. The historian needs both perspectives — but it is salutary and right to see the outcome of history at the personal level, in the chronicle of its effects on one man. This Holmes enables us to do: which is why his book is appointed to be read not only in the United States but in British universities now under threat of 'reform'. □

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Beginnings in an Eastern Eden

John D. Barrow

Creation of the Universe. By Fang Li Zhi and Li Shu Xian. *World Scientific: 1989. Pp.180. Hbk \$41, £26; pbk \$25, £17.*

COSMOLOGISTS have a nagging history of conflict with authority. If your name is Aristarchus, Bruno, Galileo, Copernicus or Sakharov, then you know what I mean. The principal author of this book, Fang Li Zhi, has a similar claim to fame in the West. Until 1987 he was vice-president of the University of Science and Technology of China, but early in that year he was removed from his post and banished to the Beijing Astronomical Observatory after having been accused of stirring up student demands for greater freedom and democracy in China. More recently he was prevented from meeting President George Bush of the United States during his visit to China.

The authors remark in their preface that only by surmounting considerable hurdles has it been possible that their book could be published at all. Yet current events in China may well bring concepts such as 'freedom and democracy' back into fashion and return Fang Li Zhi to unsuspected prominence. In the meantime, he has produced a number of popular accounts of modern cosmology. *Creation of the Universe*, written with Li Shu Xian, is the most recent of them and offers an account suitable for introductory reading by science students or general readers with some background in mathematics and physics. The mathematics is elementary and is frequently alleviated by the liberal use of good diagrams and elegantly drawn cartoons; the English is for the most part good enough not to distract from what the authors are trying to convey.

The content is a sandwich in which the substantial central section of six chapters contains clear accounts of the dark matter problem, thermodynamics, the hot phase of the early Universe, the origin of the elements, matter and anti-matter in the Universe, and inflationary expansion. Occasionally, there are minor lapses — magnetic monopoles *are* produced in the inflationary Universe, but they are swept beyond our visible horizon; the history of the prediction of microwave background by Gamow is imaginary; the resolution of Olbers' Paradox is simplistic; the strong conclusions drawn about elemental abundances ignore the possible contributions by a pregalactic population of very massive stars; and the discussion of the geometry of the Universe, which argues

that there are only two possible cases, ignores the simple euclidean possibility altogether.

Nevertheless, there are also many commendable features. There are no unnecessary complexities or mathematical smokescreens, and up-to-date accounts of the relevant observational data are given. Whenever ideas from particle physics are required, as for example in the discussion of the origin of baryon asymmetry in the early Universe, they are economically introduced.

Many of these explanations and simplified derivations will be familiar to the intended audience, so it is a pity that the authors provide no references to other works. Given that their aim could have been to do nothing more than initiate the student into the basic physical ideas of modern cosmology, it seems perverse not to have directed the reader towards more substantial sources.

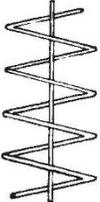
The core of the book is sandwiched between two rather wobbly sections which cannot really be recommended. Both are far too ambitious and are unsuccessful, although for quite different reasons. In the erratic introductory chapter, the authors attempt to explain the whole sweep of structures in the Universe as a generalization of Laplace's picture of the origin of the Solar System in which the flattened disk of the solar nebula arises because of rotation. The subsequent claim that spheroidal galaxies and galaxy clusters thus have non-spherical shapes because of rotation is not correct.

Also distinctly dodgy is the ensuing argument that small-scale structures in the Universe have symmetrical forms because they have completed gravitational collapse, whilst ragged superclusters of galaxies are asymmetrical because they have not. In fact the very opposite is more likely to be true. In the absence of pressure, gravitational collapse magnifies deviations from spherical symmetry; large-scale structures are more likely to remain spherical if they are still being dragged along by the expansion of the Universe.

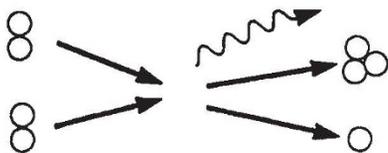
The final sections of the book contain a generally good treatment of various 'anthropic' consequences of physical constants. It is, however, spoilt by several pages of fairly vacuous 'philosophical' discussion of 'being' and 'non-being' and other such matters that only sound as if they add to our knowledge about the creation of the Universe.

Despite these occasional problems, the credits end up outweighing the debits. Here is a worthwhile elementary treatment of the cosmology of the early Universe written with a liveliness and simplicity that will surely encourage students to pursue the subject further. □

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