The cosmological racket

John D. Barrow

Inflationary Cosmology. Edited by L. F. Abbott and So-Young Pi. *World Scientific:1986. Pp.697. Hbk £77.55, $89.70; pbk £31.80, $36.80.*

DURING the past few years there has grown up an unwelcome addition to the scientific publishing business. Armed with a photocopier and a reasonably stocked periodicals' library, anyone can now create a large book in an afternoon.

Here's how you play. First, run through the literature of your subject picking out 50 or 60 interesting papers (if you know this literature reasonably well already you can skip this stage and simply turn out your files). Next, take two photocopies (one for the publisher and one for you to keep — you don't want to end up having to buy the "book" do you?). Now shuffle them into a set of seven or eight related subjects. Sit down and write a page or two of introduction to each and then call it a "chapter". Finish in time to catch the afternoon post to the publishers; they do the rest. The result in this case is a book of offprints which you could have photocopied for yourself, or obtained free of charge from the contributing authors, but which sells in hardback for no less than seventy seven pounds in Britain or a shade under ninety dollars in the United States.

What can one say about books such as this? Only the copyright holders of the articles have it within their power to prevent their appearance. Even if inexpensive I would still argue that they are a bad thing. They encourage the beginning student of the subject at whom they are aimed to avoid contact with the research literature. Thereby the student fails to find interesting papers by chance and fails to learn how to use the scientific literature systematically and serendipitously. The editors of the collection seek out only papers that support a particular approach or theme and create the artificial impression that a very speculative and exciting research area is literally a closed book

Of course, some of these defects can be remedied by good contextual analyses and connecting discussions by the editors. Here, little effort has been put into this potentially mitigating feature. The introductions to the chapters are only about two sides in length on average, and are too brief to describe adequately the complexities involved — many of the papers were written at quite different times and for different reasons, and even come to conflicting conclusions. The few pages of introduction that do appear are not always satisfactory, especially in the early parts of the book (for example, the Friedman equation is given incorrectly in the opening pages). Confusion is also caused by the continual assertion that the theory of an inflationary universe predicts that today the Universe should have density *equal* to the critical density. Whereas, in fact it predicts only that the density must now be very close to the critical density. This distinction is crucial. If the density were equal to the critical value today it would always have been, and there would have been no role for inflation to play in explaining the fact.

A more serious misjudgement is in the selection of observational evidence in the chapter on dark matter. Unfortunately, the sole observational paper discussing the evidence for dark matter in spiral galaxies is devoted to optical rotation curves, even though it is now well known that these observations do not require dark matter for their explanation. The key observational data are the 21-centimetre observations of spiral galaxies performed by radio astronomers. It is this work that establishes the existence of dark matter well beyond the optical extent of the Galaxy and is the cornerstone of all observational evidence for dark matter. Not one report of these data is included.

The good points of the collection are of course the papers themselves, some worthy inclusions having been written by the editors and their collaborators. The combination of authors from observational astronomy, particle physics and astrophysics illustrates the healthy and ever-expanding state of modern cosmology. But anyone working seriously in the subject will already have read 90 per cent of these papers and will be familiar with all of them.

Librarians whose budget cannot keep pace with the other inflationary universe should be aware that their periodicals' collection already contains the contents of this book. Individuals working in Third World or soft currency countries can obtain them free by sending reprint requests to the authors of the individual papers. □

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• A second edition of *Ideals and Realities: Selected Essays of Abdus Salam* has been published by World Scientific. Price is hbk £37.75, $47.20; pbk £23.85, $29.80. The first edition was reviewed in *Nature* **312**, 216 (1984).

Peculiar progress

Tony Davies

Paradoxes in Immunology. Edited by Geoffrey W. Hoffman, Julia G. Levy and Gerald T. Nepom. *CRC Press:1986. Pp.336. $114.50 (United States), $131.50 (elsewhere).*

IT IS a common problem among teachers that ignorance of a particular phenomenon is difficult to impart; the rapt student often wishes only for the comfortable wash of supposedly hard facts. Research workers, on the other hand, must start from the premise that the contemporary array of knowledge is inadequate and that it is their duty to add to or change it. Researchers teach occasionally, and one serious consequence is that, perhaps affected by their teaching activities, they often invent an authoritative dogma which can impose constraints on the process of discovery. These constraints are often referred to as working hypotheses, and the intent of their inventors sometimes seems to prove them come what may.

In biology, because the working hypotheses are commonly at variance with the truth, paradoxes arise. Such paradoxes in immunology are here collected together in the form of a book. It is mildly surprising that they have to be viewed as irrationalities rather than small flaws in the thin veneer of our knowledge.

The three editors wrote to 150 immunologists asking them to contribute their own pet anomaly. Forty said they would. Twenty-seven actually did. The papers were in the main assembled in the same format; first, exposition of the paradox, then a statement of the two apparently contrasting sets of facts and a brief discussion to follow. The final versions were then sent out to various high priests in immunology, nominated by the authors, for their comments. In some instances the original authors have exercised a brief right of reply.

It all sounds the very stuff of science — proposition, argument and counter-argument. What could be better? As presented it is, I regret to say, not easy to understand. I doubt whether the editors could explain more than a small fraction of the material in the book to their own students. The fault is not entirely theirs in that contemporary immunology is a morass of partly digested and ill-coordinated facts, many of which are almost surrealistic in the indirectness of their impact.

For all this, the intention of the editors was a worthy one. Their aim, they write, was to enhance the rate of progress in immunology. They see a collection of paradoxes coming out on a regular basis and encourage the submission of contributions. The idea ought to work in time, but in practice much better editing, more independent refereeing and more plain speaking will be required. Biologists invent their own jargon which, not intentionally, has the effect of isolating particu-