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saturation, although at a reduced rate. The rates of transpiration and translocation were similar. The behavior of fairy rings appears to bear out the theory that transpiration and translocation are closely connected.

At least one of the cellulolytic fungi, *Memnoniella echinata*, has been studied intensively, and it has been shown that spores of this fungus and of *Stachybotrys atra*, another cellulolytic fungus, may be produced on the same mycelium.

There are also, unfortunately, some serious omissions.

To date, attempts which have been made to study the succession of development of these fungi [which inhabit dung] have been weak except for the little attention which has been given to the matter in certain laboratory exercises.

There is no mention of the work of Harper, Richardson, Wicklow, Larsen, Ikediugwu, or even the reviews by Webster or Lodha.

Few studies have been made on the succession of fungi involved [in wood decay] or their contribution to the rate of decay.

The important phenomenon of fun-

gustasis and Lockwood's review (*Biol. Rev.* 52; 1977) are completely ignored. There is no mention of heterogenic incompatibility. The effects of C/N ratio on fungus growth are covered in four lines and one reference. The subject of mating behaviour in *Achlya* is discussed without reference to antheridiol and oogoniol, and that of the Mucorales without reference to trisporic acid. The illustrations are sparse, consisting mainly of graphs or histograms, with relatively few, badly reproduced half-tones. The number of misprints is high.

The most useful feature of the book is the list of 1293 references. But, as already indicated, it is seriously lacking in some subject areas, and is not very recent (116 references post-1975, 19 references dated 1977 and 1 for 1978).

With all these defects and a high price the book is not worth buying by individuals, although some well-endowed libraries may find a place for it. □

John Webster is a Professor and Head of the Department of Biological Sciences at the University of Exeter, UK.

Highways and byways of cosmology

M.J. Laird

Theoretical Cosmology. By A.K. Raychaudhuri. Pp.298. (Clarendon/Oxford University Press: Oxford, 1979.) £10.

IN THE preface, the author expresses the hope that this book will prove both a handy reference for the professional cosmologist and a readable and informative review for the advanced graduate student and the physicist who is not a cosmologist. I should state straightaway that I am numbered among the non-cosmologists, though I was supervised by one cosmologist (H. Bondi) and did post-doctoral work under another (T. Gold).

Now for the contents of the book. After a brief introduction, the author presents the standard Newtonian and relativistic cosmologies. There are chapters on the microwave radiation background, thermal history and nucleosynthesis, singularities, perturbations, galaxy formation, and on the tricky business of analysis and interpretation of observational data. However, a particular feature is the inclusion of a wide range of models and theories. Some of these, such as relativistic models not satisfying the cosmological principle, varying gravitational constant and Brans-Dicke theory, and Einstein-Cartan theory, are considered in some detail. Others — two-

tensor theory, the conformally invariant theory of Hoyle and Narlikar, and theories involving equal amounts of matter and antimatter — receive brief mentions. At the end of the book, the author discusses the extragalactic radio sources, and those hardy annuals, Mach's principle and Olbers' paradox.

The book is reproduced from typescript. There are some errors, including the definition of the Ricci tensor, and some places where one could be confused. For example, on one page *R* appears in the field equations, and on the next as the scale factor in the Robertson-Walker metric without indication that the meaning has changed. The author also writes "deuteron" for both deuterium and the deuterium nucleus.

The exposition is certainly that of the review rather than that of the monograph or treatise. Many results are presented rather than derived, though there are many references (about 800). I can vividly remember meetings of the Royal Astronomical Society at which cosmologists spoke with evangelical fervour. In contrast, the author takes a rather dispassionate view. As far as the stated objectives are concerned, I think that the non-cosmologist with no prior knowledge of the subject, or at least of general relativity, would find parts of the book fairly hard going. The cosmologist (or prospective cosmologist) might find it a useful guide to the highways and a reminder of (or introduction to) what are currently some of the byways of cosmological theory. □

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