

The revision of this substantial work (essential for all research workers in this field) is wholly welcome. Furthermore, it can be thoroughly recommended for those without a copy of the previous edition in their possession. It is, however, hard to justify bringing one's personal library up to date in view of the small number of changes that have been made to the text.

A. L. T. POWELL

ALGEBRAIC TOPOLOGY

The Topology of Classical Groups and Related Topics
By S. Y. Hussein. Notes on Mathematics and its Applications. Pp. viii + 128. (Gordon and Breach: London and New York, February 1970.) 95s; \$11.40.

THIS book is based on notes of lectures first given in 1963 to University of Wisconsin graduate students who had previously undertaken a basic course in algebraic topology. Although the material has been polished up in the writing, the overall impression is still one of lecture notes rather than of a finished work. For example, the book has no index. Thus forewarned, the reader will need pen and paper as a constant companion as he journeys through the book.

In spite of or perhaps because of this, the author covers a lot of ground. In the first chapter fibrations are treated together with universal fibrations and various classification theorems are given. After the start of the second chapter, the author defines the concept of an algebra in a universal fashion (in fact, the whole book is very modern in style). Having done this he is then free to dualize and define a co-algebra and a Hopf algebra. The rest of the chapter is devoted to calculating the homology and cohomology of the classical groups. In chapter three the author considers the homology and cohomology of the classifying spaces and loop spaces of the classical Lie groups. This naturally leads on to Bott periodicity and, finally, in chapter four, to K-theory.

ROGER FENN

MODERN CATALYSIS

Catalysis of Gas Reactions by Metals
By A. J. B. Robertson. Pp. xi + 182. (Logos, in association with Elek Books: London, June 1970.) 70s.

THE development of comparatively straightforward techniques for reducing the pressure in a laboratory-sized apparatus to the ultra-high vacuum region has had a stimulating effect on the study of the reactions of metal surfaces with simple gases. The reason for this is that by producing background pressures in this region it has become possible to study a chosen reaction in the complete confidence that the residual gas does not make a significant contribution to the observations. The reliability of the measurements has been of great importance in view of the sometimes unexpected results which have been reported. Dr Robertson is well known for his contributions in this area of research and in his book he has chosen to give prominence to some reactions which have been studied under ultra-high vacuum conditions.

In the first two chapters, which constitute about one third of the book, the evolution of ideas about catalysis is traced from the contributions of Davy and Faraday in the early nineteenth century to modern deductions about the highly selective reactivity of the individual planes present on a surface. Almost all of this discussion and of the contents of the next chapter, which gives a brief account of ultra-high vacuum techniques, should be readily comprehensible by sixth-formers. Beyond this point the book gets noticeably harder, though the liberal use of easily understood diagrams and a lucid exposition should allow much of it to be read with profit by this group and by undergraduates in their first year.

The second half of the book describes the distinctive aspects of the contemporary approach to catalysis. Modern techniques for cleaning and studying metal surfaces are described systematically, though briefly. No doubt deliberately, the author refrains from much comment on the relative importance and contribution of the various techniques he describes. This is a pity, because comment from this authoritative source could have been helpful to the newcomer to the field.

In discussing the theoretical interpretation of the experimental results the most detailed treatment is given to the approach by way of transition state theory. A sensible balance is maintained in this discussion between the generalized treatment of fundamental ideas and the detailed interpretation of particular experiments.

This is a book which I enjoyed reading and which I shall recommend to undergraduates for their first encounter with the modern approach to catalysis. It is, unfortunately, presented at a price at which they cannot reasonably be expected to buy their own copy.

R. P. H. GASSER

PERSONAL RELATIVITY

Cosmology
By Jean Charon. Translated from the French by Patrick Moore. (World University Library.) Pp. 256. (Weidenfeld and Nicolson: London, July 1970.) 35s boards; 18s paper.

THIS would be an admirable book if it were not for one chapter in which the author presents a personal view of the implications of the theory of relativity, drawing conclusions which differ markedly from the accepted point of view, and which are founded on an extremely uncertain basis. The first eleven chapters give an informative, readable account of the development of man's ideas about the universe, and if the book were concluded after them I would be glad to recommend it to the many people who are interested in cosmology and astronomy but have no mathematical background.

On the cover of the book, a summary states that "The last chapters discuss the possible meanings of space, time, distance... Some of the author's ideas are new and exciting, and are explained in a way which will appeal to both the beginner and the specialist". This latter claim is far from the truth, because although Charon's ideas will certainly appeal to the beginner who knows no better, the specialist is likely to be infuriated by his glib presentation of a biased and unreliable interpretation of the implications of relativity theory as accepted facts. Any specialists reading this review will doubtless have guessed that a large part of the misconceived chapter to which I have referred hangs on an erroneous interpretation of the so-called "twin paradox" of relativistic time dilation. This is certainly not the place to present a detailed refutation of Charon's reasoning—the specialist is already familiar with this (because it has been known for 50 years that there is no paradoxical situation at all), and the non-specialist would be better referred to a standard introductory text such as *Einstein's Theory of Relativity* by Max Born (Dover, 1962).

Because on balance the harm which might be done by the latter part of this book would probably outweigh any benefit derived from the earlier part, I would not recommend it to anybody completely new to the subject, but for those interested in the history of astronomy, and who have either sufficient knowledge of relativity to be unmoved by chapter 12 or sufficient faith in me to ignore it, I would offer a cautious recommendation, although the same historical ground has been covered by other authors in books which do not misinterpret Einstein's theories.

JOHN GRIBBIN