The eloquence is directed towards presenting an approach to relativistic quantum mechanics (elsewhere called by its author "sourcery"), which he believes is more satisfactory than either operator field theory on the one hand or analytic S-matrix theory on the other. It is better than field theory because it operates at the phenomenological level and does not pretend to know what the fundamental field structures are. Its superiority to S-matrix theory lies, it is claimed, in its taking space-time structure seriously with its notion of localized sources. The motto of the book is explicitly given as "If you can't join 'em, beat 'em". Nevertheless one cannot help feeling that in the end Schwinger has, in his own special way, joined 'em. The source picture is very similar to aspects of Feynman's space-time approach to quantum mechanics and it would require the arts of a mediaeval disputant to split the difference between a scattering skeleton and a Feynman diagram. All sensible relativistic quantum mechanics, whether field theoretic or S-matrix, keep this diagrammatic picture in view as a guide to their thinking, without believing that it is in literal detail the fundamental physical theory. There is a good deal more common ground than Schwinger suggests.

The book may be judged not only as an exposition of Schwinger's philosophical point of view but also as an introduction to relativistic quantum mechanics. In its favour from this point of view are the detail and clarity of the exposition. Less satisfactory is the insistence on the sourcery phraseology and the total lack of references. The book will be a useful source of information on higher spin formalisms and on gravitons. But (and here I fulfil a prediction by Harold that reviewers would complain of things left out) it is a pity that no hint of the power of dispersion theoretic methods is given. The complex plane has been a remarkable discovery (see p. 36).

J. C. POLKINGHORNE

COMPLEX FUNCTIONS

A First Course on Complex Functions

By G. J. O. Jameson. (Chapman and Hall Mathematics Series.) Pp. xii+148. (Chapman and Hall: London, September 1970.) 30s.

THE author of this book has aimed at producing a thoroughly rigorous introduction to complex function theory, suitable therefore for undergraduates interested in mathematical analysis for its own sake rather than for its applications. Formally, the subject is attractive and easy, the difficulties chiefly arising from topological problems concerning the nature of the domains to which Cauchy's theorem applies. To turn these difficulties the theorem is proved for a triangle and extended to a star-shaped open set; this suffices for many purposes. To keep the book small, more advanced topics which are not immediate consequences of Cauchy's theorem, such as analytic continuation, Riemann surfaces, and the general mapping theorem, are excluded.

There are three sections. Basic theory comprises: the complex number field, making use of the concepts of a metric space; power series and the exponential function; and the definition of integration. Differentiable functions have a section which includes Cauchy's theorem, the residue theorem and the Taylor and Laurent series. The final section is chiefly concerned with the calculus of residues and particularly with the evaluation of real integrals by contour integration.

The undergraduate coming to this text may well have had some earlier heuristic and geometrical acquaintance with the complex variable. The bracing discipline of this lucid if austere account will, if he is to be a serious student of analysis, set him firmly on his road.

T. A. A. BROADBENT

Short Notices

Innocent Killers. By Hugo Van Lawick-Goodall and Jane Van Lawick-Goodall. Pp. 222+33 plates. (Collins: London, October 1970.) 45s.

THE Van Lawick-Goodalls have taken the unusual step of publishing original scientific research in the form of a book written specifically for the general public. It is unfortunate that this laudable attempt to bridge the gap between popular and scientific writing is not altogether successful. Lack of quantitative data and anthropomorphisms such as descriptions of animals as "resentful" will make the scientific reader uncomfortable. The standard of writing is patchy. Although the chapters on wild dogs and jackals, which contain straightforward accounts of observations of the behaviour of these animals, are very readable, the initial "background" chapter fails to be so. Nevertheless, in spite of these drawbacks, this book, with its exciting photographs, contains much of great interest about the lives and behaviour of some little-known animals.

Man's Ancestors: An Introduction to Primate and Human Evolution. By Ian Tattersall. (Introductory Studies in Biology.) Pp. 64. (Murray: London, October 1970.) 20s paper.

PALAEOANTHROPOLOGY may not be everybody's idea of a fast moving subject. Nonetheless, new discoveries of fossils and developments in dating techniques are leading to continual reappraisals of the steps of man's evolution, and up to date summaries of current thinking from time to time certainly help to link the new finds together. This new book, by Ian Tattersall, is a good example of the review required and students, in particular, should find it useful. Its one disadvantage is that the author seems a little unsure of his potential readership. He assumes only slight knowledge of animal classification, evolutionary processes and the geological timescale and therefore has introductory chapters on these aspects. On the other hand, without a glossary of terms or a labelled drawing of a human or primate skeleton or of a skull, he expects his readers to be acquainted with some quite complicated anatomical terminology. The large size of the book (29.5 x 21.5 cm) may make it awkward for the bookshelf, but it does allow for a more adventurous layout than is usual and photographs (of which there are plenty) and line drawings are shown to good advantage.

Carbon Fibres. Edited by Eric A. Smith. (Design Engineering Series.) Pp. 79. (Morgan-Grampian: West Wickham, Kent, 1970.) 55s.

IN any rapidly developing technological field there is often an acute lack of any overall state-of-the-art publication suitable both for the professional and the interested layman. This book usefully combines the two needs and covers many aspects of the production and use of carbon fibres and fibre reinforced materials. Each of the eleven chapters is written by authorities on carbon fibres drawn from industry, the world of engineering journalism, and the government departments and research establishments which have been connected with carbon fibre development. The editorial introduction points out that there is an inevitable overlap between chapters, but this is on the whole desirable because the reader is reminded from time to time of the important basic facts and figures. The appearance of rather unfamiliar abbreviations could, however, make it rather difficult to dip randomly into the book if one is a complete stranger to the subject. A useful bibliography is provided, together with a list of principal British manufacturers and suppliers of both carbon fibres and composites.