

THE PHILOSOPHY OF SCIENCE: A SYSTEMATIC ACCOUNT. *By Peter Caws. Princeton, N.J., Van Nostrand. 1965. £2 12s 6d net*

Dr. Caws describes his book as a 'systematic account' of the philosophy of science. His aim is to introduce readers to the variety of topics discussed by philosophers of science, linking them together to show their connections and the way in which views on one such topic restrict the views that can consistently be held on others. The first part, 'The Discovery of Theory', starts with such general chapters as those on 'Knowledge' and 'Language' in which the terms of general philosophical analysis are introduced. The discussion is then more concentrated on problems in linguistic analysis and epistemology pertinent to the philosophy of science.

The second part of the book, 'The Structure of Theory', gives an elementary exposition of modern logic and its application to the formal characterization of scientific theory, with excursions into mathematics and measurement. In the third part, 'The Validation of Theory', Dr. Caws turns to the central problems of the philosophy of science, which are raised in the study of the linking of scientific theories to the human experience which they purport to explain. Here the topics of induction, probability, confirmation, and scientific method are dealt with in a swift and orderly fashion.

Finally, in 'The Spectrum of Theory', some more particular problems, of space and time, causality and determinism, teleology, conventionalism, are put in their allotted places.

The aim of the book seems to me admirable. There is a coherence to the philosophy of science which is rarely well displayed at an introductory level. In teaching the subject, one has to rely too much on scattered articles, and even when these are collected judiciously in sets of 'Readings', the diversity of styles and objectives gives a disjointed air to the subject which conceals the connectness of its parts. There are some excellent general surveys at a more advanced level, notably those of Nagel and Pap, and a number of classic works which concentrate on more specific problems or points of view, such as those of Braithwaite, Kneale and Popper. But the introductory works available, that of Toulmin for example, are all sketchy and inadequate in their coverage. So there would be a warm welcome for a book which did well what this book sets out to do.

It is the more regrettable, therefore, that this book should so inadequately fulfil its author's purpose. In his desire to be both comprehensive and systematic in one volume (even of 350 pages) at an introductory level, the author has been forced into too facile an exposition. All the terminology is deftly introduced, appropriate to the set of answers which Dr. Caws expounds, but the depth of the problems to which these are answers is barely hinted at. None of the analysis is rigorous or complete enough to give even a beginner in philosophy a taste of the complexity and difficulty of the subject which makes so elaborate a superstructure necessary or even interesting. There is no philosophical bite to the book, no sense of a discipline that is challenging and incomplete, still alive and worth embarking on. The lack of this is too high a price to pay for completeness of coverage. The steady elaboration of a structure of answers to problems whose urgency and interest are simply not communicated becomes very tedious. There is altogether too much system and not enough account.

Within the limits he has set himself, Dr. Caws gives some admirably concise accounts of standard views. The overall structure of the book, if only it could have been brought to life, is sound and well proportioned. If the earlier parts seem more cogent, this may merely reflect a reviewer's interest not yet eroded, but I think it also shows that the author finds it easier and more congenial to set up a philosophical system than to deploy it effectively against specific problems. Even there, some of his conclusions, such as the essentially private nature of scientific theory, are odd enough to require more supporting argument than they are given. One particular

complaint that must be made concerns the eccentricity and utter inadequacy of the references, which are given merely as sources of quotations or opinions (and not always then) and are rarely of any conceivable use as guides to further reading. To take just one example, it seems almost incredible that the chapter on 'The Calculus of Probability' should cite, and only cite, Russell's *Human Knowledge* as a source of the probability axioms.

This is, in short, a most disappointing book. Starting with the best intentions to fill a notable gap in the literature, it is likely only to bore and repel those who are looking for an introduction to the philosophy of science. The general reader will not taste so weak a brew; the student will be sated without being satisfied.

D. H. MELLOR

A FIRST TECHNICAL READER. *By Geoffrey Broughton. London, Macmillan, 1965. 4s 6d net*

This Reader is built on a traditional plan. It consists of thirty short extracts, on a wide variety of scientific and technological matters, from the Society's *Journal*; the extracts are arranged roughly in order of difficulty, and each is followed by a glossary and exercises with the triple aim of helping students to broaden their vocabulary, to wrestle with specific phrases, and to cultivate their own powers of expression by crystallizing whole sections in their own words. The original pieces were all written by experts and aimed at the educated layman; many of them are accompanied by photographs or line-drawings.

One layman at least will confess that he has read the extracts with pleasure and profit, but he must also confess that he found the net effect of the work to be invincibly academic: it was perhaps an original error of selection to take all the pieces from one source, instead of ranging more widely, for, whatever the individual merits of the extracts, the student seems to be given no indication that if he ever does write anything technical he is also writing in order to be read by living people and not merely in order to satisfy his own sense of the fitness of a word or words.

The aim of the Reader is to provide an introduction to technical English writing for the student who has 'completed a normal English course'. The standard of this 'normal' course is not stated, and the value of a specialist Reader such as this depends so greatly on the nature of the previous course that it is a pity that we are left with our own preconceptions about it (and about the quality of the student's absorption of it).

Unfortunately the tendency of this compilation (and of others of a similar kind) is to treat English purely verbally, in almost chop-logic fashion. There is no hint of the main problem inherent in all forms of writing—the logic of presentation (organization of the writer's words in such a way that he proceeds from the known to the unknown, from the simple to the complicated; assumptions about the nature of the readers aimed at and about their present knowledge and cognitive speeds; the tone of the explanation). Perhaps the editor assumes this to have been covered in the normal English course (if it has been, his technical students have been more fortunate in their education than any of mine); or perhaps it will form the theme of a subsequent Reader, as the ordinal number in the title indicates the possibility of a series.

However, even granting the validity of the compiler's aim and the general success of the method, it still remains true that the standard of readership aimed at is uncertain. Will technical students really welcome such information as that 'jib' means 'the long arm of a crane' or that 'push-buttons' are 'switches which are operated by pushing a small knob or button'? Perhaps the student is assumed to be foreign, but no indication of this assumption is given (except perhaps by implication: the book was printed in Hong Kong).

Certainly it is desirable that students should be able to spell correctly and should know the general rules of punctuation and grammar: but it is immensely more desirable