

conscientious and carefully constructed if perhaps rather pedestrian monograph will make somewhat depressing reading. After a short but useful account of the history of the tribe and of its brief years of glory, the social system of one of the several small tribal fragments of the Zulu, the Makhanya, who live, about 15,000 strong, on a location about 25 miles south-west of Durban, is described in detail. The book has three main parts, dealing informatively with land use and economics; family, kinship, descent and marriage; and the politico-legal system. It concludes with two brief chapters on theoretical aspects of the study of social change which, like most theorizing by social anthropologists in this field, add little to our already reasonably clear picture of what is going on.

When Dr. Reader studied the Makhanya in the early fifties they had long ceased to be the proud warrior tribe familiar to Victorian schoolboys. With traditional values appropriate to unlimited land resources, a largely pastoral way of life, and shifting cultivation, the restricted area they now occupied was quite inadequate for their support. They had shown little response to the Administration's sporadic and somewhat feeble attempts to persuade them to adopt the changed methods of cultivation and animal husbandry which might have enabled them to sustain a wholly agrarian economy in modern conditions. Instead, 50 to 80 per cent of adult men engage in migrant labour (mainly in Durban) to provide themselves with the means for participation in the cash economy in which all Makhanya are now involved. The consequent increase in individualistic values, paralleled in almost every part of Africa, is expressed in numerous modifications of the traditional culture, ably documented by the author.

But, surprisingly, some traditional institutions, notably the basic essentials of the former military regimental system, survive with astonishing tenacity. Although the Makhanya are down they are by no means out. Traditional values, though changing, still survive and a sense of Makhanya identity is still strong. As the author rightly observes, the society he studied (like many another) is neither wholly "tribal" nor quite assimilated to Western norms, but is in a state of transition. And he wisely declines to prophesy what the final result of this process may be.

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extent our reports of measurements made reflect our arbitrary conventions and to what extent they are informative about the physical world. He deals with other topics more briefly, merely setting forward alternative points of view and stating without argument his preference. He does this, for example, when considering whether a numerical measure can be given to the likelihood of a scientific theory being true, and, if so, whether it is a measure of probability in the sense in which we use that term to make judgments about the probability of the occurrence of events. This approach is inevitable in a book dealing briefly with many different topics within a controversial area, and Carnap, unlike many philosophical writers, has recognized the inevitability.

It is hard to fault this book, but one general criticism of Carnap's approach might be appropriate. In many passages Carnap seems to assume that the only evidence for the correctness or incorrectness of a scientific theory is that predictions made from it turn out to be true or false. But there is at least one further criterion used in judging the correctness of scientific theories—their relative simplicity. If one theory orders the data in some field in an evidently simpler way than another theory, that is grounds for saying that the first theory is correct and the second incorrect. I do not think that Carnap would wish to deny this point without qualification, but there are many passages in the book where he seems to ignore it. Thus, in discussing alternative time scales, he rightly claims that if we choose a man's pulse beat rather than the tick of a pendulum as our clock, the laws of physics would become extremely complicated. If we record our observations in terms of the former time scale and devise a theory which adequately accounts for them more simply than any other theory, that theory will still be an extremely complicated one. But, he argues (page 83), "there is no sense in which it is 'false' to measure time on such a basis". But surely the vast complexity of the resulting theory is ground for claiming that the alternative theory which accounts more simply than any other theory for the observations described in terms of the pendulum time scale is more likely to be true and so for saying the same of the time scale which it uses.

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CARNAP'S PHILOSOPHY

Philosophical Foundations of Physics

An Introduction to the Philosophy of Science. By Rudolf Carnap. Edited by Martin Gardner. Pp. x+300. (New York and London: Basic Books, Inc., 1966.) 45s.

RUDOLF CARNAP is one of the most distinguished American philosophers of this century. Most of his writings have been on formal logic and on the philosophy of logic, but he began his career as a philosopher of science with the publication of his doctoral thesis on "Space" in 1922, and has always retained his interest in it. The present work originated from a lecture course given regularly by him. A transcript of the course was taken, and was edited and simplified by Martin Gardner. The result is a brilliantly clear introduction to the philosophy of science. There is considerable lack of good introductory textbooks on the philosophy of science. Such textbooks as there are either make very awkward reading or presuppose too much in the way of logic or mathematics. Carnap's book suffers from neither of these deficiencies. It is clear and simple, and will prove a great boon to teachers of the subject.

Topics covered include explanation and prediction, probability, measurement, the structure of space, causality and determinism, and the structure of scientific theories. Carnap deals more thoroughly with measurement and the structure of space than with the other topics. He analyses what rules we must have in order to make a measurement of extensive or intensive magnitude, and shows to what

AVIATION PHYSIOLOGY

A Textbook of Aviation Physiology

Edited by J. A. Gillies. Pp. viii+1226. (London and New York: Pergamon Press, Ltd., 1965.) 200s. net.

THIS book is the combined work of 22 authors, and presents, as Air Vice Marshal W. K. Stewart says in the preface, "a picture of the principles practised at the R.A.F. Institute of Aviation Medicine" at Farnborough. The Institute houses extremely well-equipped laboratories of human physiology, and, while the research at the Institute must embrace immediate practical problems, the Institute has been continuously concerned with their underlying fundamental basis. The high standards set and maintained at the Institute will be apparent to the readers of this volume.

The book is addressed to those attending courses in aviation physiology, to practitioners in aerospace and aviation medicine, and as a supplementary text to students reading for an honours degree in physiology or ergonomics. It will, however, appeal to many readers outside these fields. Aviation physiology is concerned with defining the limits of human tolerance to a great many different stresses, and the nature of the response to such stresses. There is no aspect of physiology which is unimportant to the aviation physiologist, although from the practical point of view some aspects are more important than others.

This book assembles and synthesizes in a lucid and convenient form information that is otherwise scattered.