

Theory of conditioning

Classical Conditioning and Operant Conditioning: A Response Pattern Analysis. By W. W. Henton and I. H. Iversen. Pp. 355. (Springer: New York, Heidelberg and Berlin, 1978.) DM 54; \$29.70.

THE argument of this book is that the phenomena of conditioning can best be understood by observing behaviour in all possible detail, and describing the effects of contingencies between stimuli, rewards and responses on everything the subject is doing. The authors build up an impressive, if partisan, case for this "response pattern" theory and for the "multiple response" experimental technique which it implies. Along with these latter, however, they bring us a metatheoretical commitment to a hard-line Skinnerism, according to which even the editorial policy of the *Journal of the Experimental Analysis of Behavior* is dangerously revisionist. Any attempt to use behaviour as an index of an underlying state, physiological or mental, is consistently condemned as "phrenology".

This package of experimental method, theory and ideology is applied to five problems: classical conditioning against an instrumental baseline (conditioned suppression and its variants); concurrent operant performances; multiple schedules of reinforcement; collateral (adjunctive) behaviours; and concurrent classical conditioning. In each area the authors produce original experimental ideas and have provocative remarks to make about currently dominant theories, and they repeatedly show that if the attempt is made to record all an animal's behaviour, regularities of response sequencing can be found to underly effects of reinforcement schedules that have mainly been analysed at a more molar level in the past.

Although Henton and Iversen break away from recording a single "arbitrary operant" response, they still use arbitrary subjects (rat, pigeon, monkey) in wholly artificial, stereotyped learning situations. But it is a little unfair to criticise them for faults they share with most of operant psychology. More seriously, they entirely ignore the regulatory aspect of instrumental responding, which must constrain the subject towards that "averaging over minutes, hours or days" which the authors condemn. In fact they never ask themselves either what the behaviour they observe so microscopically, or the conditioning they are trying to explain, might be for. I cannot help feeling that this blindspot, which greatly weakens

the authors' argument, is partly due to their ideological position.

Minor niggles include the lack of an author index (exacerbated by having separate bibliographies for each chapter), a high misprint rate, a slightly petulant tone savouring of "Reply to Reviewer B" in places, and occasional lapses from English idiom, which, though never a threat to understanding and also forgivable from Iversen, ought to have been caught by his publisher or co-author. There are two serious omissions from the point of view of the reader's convenience. First, the authors miss the opportunity to establish a consistent way of presenting multiresponse data. No book containing detailed accounts of 31 experiments can make easy reading, but repeated changes in

diagram conventions make things harder than they need be. Secondly, we could have done with summary tables, for each chapter or the book as a whole, giving the main procedures and results of all the experiments. As it is, there isn't even a concluding chapter to review and summarise the argument. Nevertheless, the book deserves a welcome, partly for giving an integrated account of an extended research programme, but mainly as an empirical challenge to some widespread current generalisations about conditioning.

S. E. G. Lea

S. E. G. Lea is Lecturer in Psychology at the University of Exeter, UK.

Sensory integration

Handbook of Behavioral Neurobiology. Vol. 1: Sensory Integration. Edited by R. B. Masterton. Pp. 579. (Plenum: New York and London, 1978.) £24.88.

IN the words of the publisher *The Handbook of Behavioral Neurobiology* will provide "a critical systematic enquiry into those aspects of neuroscience having the most direct and immediate bearing on overt behaviour." The targets for this first volume are "practising neuroscientists looking for a concise and authoritative treatment of developments outside their particular specialisation, and students who need an overview of the persistent and current problems surrounding the relation of the perceptual systems to behaviour". The eighteen authors were asked to "sacrifice comprehensiveness for illumination". Without exception they have complied with editorial pressure and in so doing have produced a surprisingly well integrated book which should achieve its aims.

The ten chapters dealing with the individual sensory systems form the core of the book. Not surprisingly the visual system claims more space than any of the others, but it is closely followed by the vestibular and auditory systems. Olfaction, in some ways the most interesting of the senses, brings up the rear with less than half the space earned by the gustatory and somatosensory systems. The reader, be he a practising neuroscientist or a student, will probably first turn to one of these chapters; and he will not be disappointed. Without exception the authors have provided illumination and not always at the expense of comprehensiveness.

It would be a pity, however, if the first three integrating chapters escaped attention. Erickson who writes chapter three prefaces it with a quotation from Poincaré: "Science is built up with facts as a house is with stones. But a collection of facts is no more a science than a heap of stones is a house". These first three chapters provide the reader with plans for a house. Erickson himself argues that our knowledge of sensory processes will be constrained "if we resist seeing beyond the idiosyncracies of each system". He then moves towards a general theory of sensory neural function. In the second chapter, Cunningham and Murphy explore the ontogeny of sensory systems and ask whether their developing structure and function are wholly genetically determined. Despite the weight of the present evidence they think not, and predict that future work using anatomical and physiological techniques which can detect the subtleties of sensory perception will show that the contribution of nurture to sensory development is the rule rather than the exception.

Finally the editor's opening chapter surveys the evolutionary history of the six sensory systems. For each he provides a useful common plan for all vertebrates and then briefly discusses any striking variations. He concludes each section with a discussion of the notable changes which have probably occurred in the evolution of the human sensory system in question.

These three chapters provide a good introduction to a useful book which sets a high standard for those which are to follow.

J. R. Symons

J. R. Symons is Professor of Psychology at the University of Aberdeen, UK.