

isation and Memory, edited by Tulving and Donaldson (Academic Press, 1972).

Three chapters, by Bower, Simon and Chase and Clark, discuss the use of visual imagery in a variety of tasks. The differences between these writers, lying as they do in the nature of the underlying abstract representation in such tasks, illustrate the sophistication of the current approach and provide a link to studies in psycholinguistics. In the remaining chapter, Calfee, Chapman and Venezky present an analysis of the skills a child requires if it is to learn to read.

In the entire volume there is little or no reference to or concern with the biological substrate of the postulated processes. This seems quite proper since psychological descriptions are necessarily different from physiological, the latter providing only limiting conditions for the former (such as time of operation), and justification for separation of particular functions (as with evidence from aphasia). There is still simplification, of course, but as Gregg's excellently produced volume shows, current psychological theories are interestingly powerful.

JOHN MORTON

Palaeomagnetism

Palaeomagnetism and Plate Tectonics. By M. W. McElhinny. Pp. x+358. (Cambridge University: London, February 1973.) £8.50; \$27.50.

ALTHOUGH shorter and cheaper texts on palaeomagnetism have appeared in recent years, this is the first attempt at a comprehensive presentation since Irving's *Palaeomagnetism and its Application to Geological and Geophysical Problems*. Hence it is natural to assess McElhinny's book against the standard set by Irving's. Since 1964 when Irving's book was published a new and fuller understanding of the evolution of the present day ocean basins has been worked out in terms of sea floor spreading and the concept of lithospheric "plates" is now widely accepted. So it is particularly appropriate that a new book on palaeomagnetism should also deal at some length with the geometry of "plate tectonics".

The book comprises about 280 pages of text followed by an appended list of palaeomagnetic data, a very comprehensive list of references and a good index. The first 150 pages of text contain an account of the method and principles of palaeomagnetism of which the essentials are clearly explained and the subject matter well balanced. The second half of the book is more in the nature of a review of the author's interpretation of palaeomagnetic data at this point in time.

Beginning with a chapter on the present geomagnetic field, the book

goes on briefly to deal with palaeosecular variations and palaeointensities. In the next chapter some elementary theory of magnetism is given and the nature of the commonest magnetic mineral series found in rocks and the physical principles of rock magnetism are described. Methods and techniques involved in carrying out a piece of palaeomagnetic work — methods of measurement, of collection of samples, cleaning procedures, field and laboratory stability tests and statistical method are outlined in another chapter.

In a chapter on reversals, well established phenomena such as the arguments for and against field reversals as opposed to self reversals of natural remanence and the polarity time scale going back to 24 m.y. ago deduced from palaeomagnetic studies of dated igneous rocks and of cores of sediment from the ocean floor are described. Then the reversal pattern over the longer time scale is discussed. Recently, at the Twenty-fourth International Geological Congress held in Montreal last year, a sub-commission of the International Commission on Stratigraphy was set up for the purpose of advising on a magnetostratigraphic nomenclature and advanced a recommended set of unit terms and hierarchies in palaeomagnetic stratigraphy. This unfortunately differs from that presented in McElhinny's figure 72 purporting to illustrate the reversal time scale in the Mesozoic in that, for example, his so-called "intervals" should be called "periods". More important, however, there is a strong feeling among palaeomagnetists against allotting special names (as McElhinny has done) to these magnetic chronostratigraphic units first until we are really certain of their existence and second because it is undesirable to burden the student with yet another set of stratigraphic names to learn.

In the later chapters, the Neogene and Quaternary palaeomagnetic evidence relevant to the establishment of the axial dipole field hypothesis is assembled and evidence for a second order displacement of the dipole from the geocentre by the order of a hundred kilometres is presented. The interrelationship between palaeoclimatic indicators and palaeomagnetic latitudes is dismissed in six pages in McElhinny's book whereas Irving devoted sixty pages to a discussion of this topic. This clearly reflects the different backgrounds of the two authors: McElhinny's background is physics while Irving's is geology, and this has had a notable influence on the form of the two books.

In the remainder of McElhinny's book, apparent polar wander curves for the various continents are described and then these data are synthesized and interpreted within the framework of the

concept of plate tectonics. The data are assembled, for the earlier part of the Phanerozoic, following a geographical pattern designed to demonstrate how Pangaea was formed by the fusion of pre-existing continental blocks.

Those who already have Irving's book and who wish to update their knowledge of the subject would find it cheaper to refer to one of the reviews of the subject presently available or which will undoubtedly appear from time to time in the near future. Those who wish to acquaint themselves with the situation in plate tectonics would be advised to consult a specialist book in this field such as Vacquier's recent publication. For those who do not own a book in palaeomagnetism, however, I recommend this as the best text available.

K. M. CREER

Experimental Epilepsy

Experimental Models of Epilepsy—a Manual for the Laboratory Worker. Edited by D. P. Purpura, J. Penry, D. B. Tower, D. M. Woodbury and R. D. Walter. Pp. 615. (Raven: New York. Distributed in the Eastern Hemisphere by North-Holland: Amsterdam, 1972.) Sfl.75; \$23.50.

IN compiling this volume dedicated to the memory of the late Don Esplin, the editors have had two stated goals. They have sought, on the one hand, to bring together in a single book a comprehensive description of the methods employed to produce various experimental models of epilepsy. To this end they have been more than successful, and the editors are to be congratulated. Twenty-four contributing experts in the field have described in detail the methods and techniques that they employ in models ranging from *in vitro*, isolated brain tissue to the light sensitive baboon.

Their second stated aim is that "the book be as critical in its approach as it is detailed in its methodology". Here the editors have fallen short of the mark. Specifically, the book suffers from two serious deficits, one a consequence of the other. They seem particularly grievous because the editors direct this book primarily to the "young investigator". The chief drawback of this volume is that it lacks a chapter devoted to a critical overview of the comparative relevance of particular models as they relate to particular experimental ends.

With the exception, perhaps, of the use of induced epilepsy as an "interfering technique" in the study of learning and memory paradigms, most experimental studies of epilepsy have at least as their covert intention a better understanding of human epilepsy. Perhaps the chapter which comes closest to filling this void is that of Jasper. In his chapter he briefly discusses the applicability of