

of the literature of the classical comparative anatomy of the cell masses and tracts in different vertebrate brains. It is a formidable problem, indeed, to know how to present this knowledge. The authors have decided to take each part separately. So we go through the details of the medulla from Agnatha to Mammals and then start on the cerebellum, and so on. It is not the authors' fault that such a division makes for difficulties in following particular functional systems. In some parts it works well—for instance, the mid-brain roof—but it

is disastrous for the reticular system, which is scattered all through the book, and it does not work well for the fore-brain.

No-one has discovered the principles with which knowledge about the structure and functioning of various nervous systems can be compared. The authors' brave attempt provides some of the facts and the stimulus to attack the problem. □

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Perceptual exploration

Stuart Sutherland

Cognition and Reality. By U. Neisser. Pp. xiii+230. (Freeman: San Francisco and Reading, 1976.) £3.70.

In 1967, Neisser published a book called *Cognitive Psychology*: it was a vigorous and clear account of that subject which marked its coming of age. The book was optimistic and gave the impression that we would eventually come to understand the workings of the mind in terms of the information processing operations it carries out. In *Cognition and Reality*, Neisser seems to have become somewhat disillusioned with the progress of the cause he espoused ten years ago. Workers in the field, he claims, are trapped in specific experimental paradigms; they fail to tap the true potential of the human mind since they use unpractised subjects and artificial tasks; their work has little bearing on real life situations and does not tell us what mind or consciousness really are.

Neisser's own solution to the problem of cognitive psychology takes the form of a shot-gun marriage between J. J. Gibson and F. C. Bartlett. To understand the mind, we must first understand the world in which people live: in particular we must understand the relationship between the information available to our senses and the external world specified by that information. The information we "pick up" depends on our internal schemata: they guide perceptual exploration and are in turn modified by it. Perception is not an instantaneous happening but an ongoing interaction between our schemata and the world. "Images are not pictures in the head, but plans for obtaining information from potential environments".

The book makes some cogent points even if they are often incidental to the main theme. For example, Neisser points out that except in a very con-

strained environment where people have few choices, we shall never be able to exert behavioural control over other people: to do so, we would need to have a complete understanding not only of them, but also of the world in which they live. We cannot predict, let alone control, the moves a master chess player will make unless we have at least as much knowledge of chess as he does. Elsewhere, Neisser exposes some of the crudities of earlier theories of cognition. He has himself shown, amongst others, that with sufficient practice it is sometimes possible to carry out two complex tasks at once: the brain is not in any obvious sense a limited capacity channel.

Cognition and Reality is not an easy book to understand or to evaluate. First, it is unclear how far Neisser is putting forward a new thesis rather than merely using a different terminology. Nor is it obvious whose views he is attacking. There is a good deal of verbal fencing: for example, he registers his objection to the idea that the mind processes information by writing: "The information itself is not changed, since it was in the light already. The schema picks it up, is altered by it, uses it". Second, his exposition of the operation of schemata remains at a very general level and he is curiously reluctant to give examples of how his ideas can explain any phenomena in detail. When he does attempt explanation, as, for example, in his discussion of the perception of emotional expression in others, the explanations are at such a general level that it is hard to see whether any new light has been thrown on the problem.

At times one may even suspect that the constant flourishing of the magic word "schemata" serves more to distract attention from the phenomena to be explained than to explain them. Although the status of Neisser's central thesis remains unclear, the book deserves to be widely read if only for the interesting and acute observations that are scattered through its pages. □

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