

of its distribution and habits, its reproduction and breeding behaviour, its parasites and diseases, and above all its feeding habits, cover much fresh ground, and will throw new light on many an old belief regarding the otter's relationship to man and his needs.

These investigations were, in fact, carried out as a result of the report issued by the Home Office Committee on Cruelty to Wild Animals, which appeared in 1951. This Committee concluded that, since the hunting and trapping of otters undoubtedly involves suffering for these animals, a thorough investigation should be conducted into the natural history of the otter, and particularly into its feeding habits, so that an informed judgment could be arrived at concerning its alleged damage to fishing interests. It is unfortunate that, through lack of funds, the work had to be discontinued after about two years. It will be agreed, however, that an excellent start has been made, and one can only hope that such an interesting and useful project will be revived at no distant date.

The appearance of Ernest Neal's "The Badger" as a paperback will be welcomed by all who missed the original edition, which was published ten years ago as a New Naturalist Monograph. It is a magnificent example of well-directed endeavour, untiring patience and skilled photography, and now provides, as inexpensively as anyone could wish, a first-class introduction to the natural history of one of the most interesting of our lesser-known mammals.

RICHARD MORSE

AGE AND ABILITY

Ageing and Human Skill

A Report centred on work by the Nuffield Unit for Research into Problems of Ageing. By A. T. Welford. Pp. ix+300. (London: Oxford University Press, 1958. Published for the Trustees of the Nuffield Foundation.) 25s. net.

FOR ten years from 1946 until 1956 the Nuffield Foundation supported a Unit for Research into Problems of Ageing attached to the Cambridge University Psychological Laboratory. The present volume is the final and definitive account of the work accomplished by the Unit during this period, and in view of the high reputation which Mr. Welford and his team won for themselves it will be eagerly read not only by psychologists and gerontologists, but also by all who are interested both theoretically and practically in human performance. They will not be disappointed. In an eminently readable book Mr. Welford has made an outstanding contribution at once to the study of ageing and to general psychology.

The book is a successor to, and intended to supersede, Mr. Welford's earlier report "Skill and Age" (1951). It is just twice the length of the previous book; and although it contains again in new contexts most of the earlier material, it also contains much additional data and a re-working of the theoretical framework. It is richer in reflexions and suggestions for future work, refers to relevant research by other investigators, and includes a valuable new chapter on methodological problems in the study of ageing. On the other hand, the statistical appendix provided in the earlier volume has been omitted, and in an endeavour to simplify the statistical presentation rather too much vital information has been left out. For example, not until more than half-way through

the book, and then only sporadically, are the numbers of experimental subjects given. As not all the experiments have been separately reported, it becomes impossible for the reader to carry out an independent evaluation of the results, and he has to accept the author's blanket statement that all the results are in fact significant at the 5 per cent level or better.

Broadly speaking the conclusions of "Skill and Age" are confirmed and amplified by "Ageing and Human Skill". Perhaps the most important additional finding from the practical point of view is the conclusion derived from the work of Kay and confirmed by other investigators that "changes of performance with age very commonly become disproportionately greater as the difficulty of the task rises". In an extremely interesting experiment on the training of women engaged on invisible mending in factories making woollen cloth, Belbin, reported here for the first time, has shown how a simplification in the way material is presented can profoundly affect the likelihood of success for trainees in middle age and beyond. This is one of a number of new industrial field studies reported in the book.

The re-working of the theoretical framework has led to the introduction of several new features. In "Skill and Age" skilled processes were analysed into receptor processes and effector processes. Between these is now included a third type of process, translation processes, which intervene between perception and action. Experimental examples are given illustrating the translation processes involved in transposing from one sensory mode to another and in making mirror reversals, but it cannot be said that Mr. Welford has made the scope and nature of these translation processes at all clear, nor has he made any attempt to explore their relationship to symbolic functioning generally. Theoretically their status remains vague. Perhaps more important is the new emphasis on the role of short-term memory backed up by a good deal of recent experimental work. Mr. Welford suggests that short-term retention is increasingly liable to interference by other activity as age advances, and that a good many of the diverse facts about learning and other changes of performance with age can be accounted for in this way. A possible explanation, he holds, may be contained in the fact that the number of active brain cells tends to diminish from young adulthood onwards, thus leading to a lessening of signal strengths, a lowered capacity for the establishment of reverberant circuits (upon which short-term retention probably depends), and a consequent increase of relative 'noise' level.

Inevitably in a book which covers a wide range of topics—movement, perception, problem solving, learning and memory, adaptability, etc.—there is some unevenness of treatment. The book is strong on the motor and perceptual aspects of skill. It is relatively thin and unsatisfying on problem solving and learning. The emotional, attitudinal and social factors which influence performance receive scarcely more than mention. But it would be unfair to hold these omissions against Mr. Welford, and only fair to point out that he is fully alive to them. With a small team of assistants, and in a limited period of time, he staked out his claim and has produced an impressive yield of results. Indeed, there is little doubt that the research reported in this book will be judged as one of the most significant pieces of psychological work produced in Great Britain since the Second World War.

L. S. HEARNshaw