

names the authors have adopted the tribal name. With camels, for example, the different tribes often use them for different purposes—pack, riding or milk as well as meat.

As might be expected, the distribution of the different species varies widely; the horse and ass are mainly confined to the north and south of the area, while cattle take their place in the intermediate zone. With cattle too, the zebu type with a large thoracic hump and short horns tends to follow the coastal areas, whereas the sanga type with its small, muscular cervico-thoracic hump and large horns tends to occupy inland areas. One interesting sidelight is that in many breeds individuals either polled or with loose hanging horns exist, showing the widespread incidence of this mutation. The genes for all-the-year-round breeding which occur in some types of sheep and goats might well be introduced into Britain. Indigenous breeds of pigs seem to be absent from Africa, for most of the types appear to conform to the breeds of the countries which first colonized the areas and even the small Bantu pig shows evidence of Asiatic origin.

The information given in this book should form a guide as to which of the various types it will be worth while to concentrate on for improvements in production, for Africa is a continent with a great potential for increased food supplies.

JOHN HAMMOND

PEOPLE AND PARROTS

Verbal Behaviour

By Prof. B. F. Skinner. Pp. x+478. (London: Methuen and Co., Ltd., 1959.) 42s. net.

AS a psychologist, Prof. Skinner has tackled the basic problem of verbal behaviour: he has not speculated about primeval grunts or the metaphysics of the word and the world, he has simply asked how the individual acquires his verbal skills. This makes such good sense that one wonders why one had not thought of it before: "We are specially reinforced by speakers and writers who say what we are almost ready to say ourselves—who take the words 'off the tip of our tongue' . . . The listener may refuse credit and exclaim *Why didn't I think of that?*, but he must have 'thought of it' to some extent if he accepted it immediately as an effective metaphor or a really apt remark" (p. 272).

The book does not attempt a quantitative or experimental analysis of verbal behaviour: "The emphasis is on an orderly arrangement of well-known facts, in accordance with a formulation of behaviour derived from an experimental analysis of a more rigorous sort" (p. 11). The concepts applied are those of 'operant conditioning', discussed by the same author in his book, "Science and Human Behaviour" (New York, 1954). Given a repertoire of loosely organized instinctual behaviour patterns or responses acquired in other situations, the animal extends its control of the environment by discriminating those of its activities which pay off. The baby gradually converts his babbling to words by progressively accurate discrimination and reproduction of the responses which his parents reward and which he can practise to himself since he both speaks and hears. "At this stage the child resembles a parrot, which is automatically reinforced whenever its vocal produc-

tions match something heard in the environment" (p. 164).

Prof. Skinner sets off from this position and gives us a conducted tour of verbal behaviour. This is fascinating: we catch glimpses of magical thinking, psychotherapy, symbols, metaphors, puns, non-Freudian slips, spoonerisms, 'Finnegan's Wake', speech disorders, generalization gradients, universals, linguistic philosophy, stylistic devices, and ways of making people say what we want without actually beating. These are, of course, only glimpses—the value of the book is that it penetrates the clouds in so many places, for example, p. 314, "It is because our behaviour is important to others that it eventually becomes important to us", and p. 7, "We have no more reason to say that a man 'uses the word *water*' in asking for a drink, than to say that he 'uses a reach' in taking the offered glass".

From his analysis the author derives several new concepts—the mand, the tact, the autolitic—and this is a considerable contribution in addition to the stimulation and insight he gives on the way.

Although one would like to recommend this book to everyone interested in any aspect of language, this might not be fair. This is a psychologist's book, and there is not much exposition of the basic concepts of operant conditioning theory in it. For those who have no acquaintance with the field the book would be harder reading: it would nevertheless be rewarding, and the reader could always refresh himself with forward glances at the later parts from time to time.

P. R. F. CLARKE

THE HARVEY LECTURES

The Harvey Lectures

Series 53, 1957–1958. By Dr. John H. Dingle, Dr. Frank Fenner, Dr. H. Fraenkel-Conrat, Dr. Joshua Lederberg, Dr. Arthur Kornberg, Dr. Albert H. Coons, Dr. Daniel Mazia, Dr. J. Gough, Dr. John H. Gibbon, jun. (Delivered under the auspices of the Harvey Society of New York.) Pp. xiv+254. (New York: Academic Press, Inc.; London: Academic Press, Inc. (London), Ltd., 1959.) 7.50 dollars.

THE Harvey Society has again amply fulfilled its constitutional aim of "the diffusion of scientific knowledge of the medical sciences". The lectures here published are too different to be adequately summarized, but their interest and variety shows the extent to which medical science now draws on general biology, and, in turn, fertilizes the latter. For example, Dr. F. Fenner's work on myxomatosis is of interest to the anthropologist and student of evolution as well as to the virologist. He points out that few of the viruses we know to-day could survive in scattered populations such as those of Palaeolithic man. How then have they arisen? The myxoma virus, from producing a benign tumour disease in the Brazilian rabbit *Sylvilagus*, has become in a short time a virulent general disease of the dense populations of *Oryctolagus*, which have spread from the Mediterranean and especially to Australia. Fenner shows how this spread has been made to provide information about the evolution of viruses, inevitably a difficult study since "viruses exist only to-day, what happened yesterday is already rumour".