

OLFACTION AND BEHAVIOUR

Mammalian Olfaction, Reproductive Processes and Behavior. R.L. Doty (Editor). Academic Press, New York, N.Y., 1976, 343 pp., US \$23.50, ISBN 0-12-221250-9.

Although for many animals olfactive perceptions must be the most important source of information about the state of their environment, we know relatively little about this chemoreceptive sensory system. The fact that our own sense of smell is comparatively rudimentary has certainly contributed to the relative lack of attention that olfactory behaviour and physiology have received. Our smelling blindness has obstructed research in two ways. Anthropocentric as much biological research is, it just has not looked at this inhuman sense. On the other hand, with our reduced capabilities it is just awkward to monitor the functioning of olfactometric equipment and, remarkably, technology for once has not yet come up with much of an aid to replace our helpless nose. This book makes it transparent what an important role olfaction plays in the control of reproductive behaviour of many mammalian species. It begins with a chapter by Scalia and Winans that integrates recent advances in the tracing of central olfactory projections with the more traditional picture. They draw attention to the difference between the vomeronasal and olfactory system. It is regrettable that they did not include a schematic diagram showing the layout of the main projections they describe. That would certainly have been helpful for the non-specialist reader. Smelling depends on sniffing, that is, olfaction is linked with respiration. This receives due and commendable emphasis in Macrides' chapter, but the olfactory influences on neuroendocrine functions indicated in the chapter's title must still be considered

as only tenuously clarified; in fact, it is not even clearly established that they exist. Albert's contribution on the development of olfaction and its influence on the ontogeny of behaviour in rodents assembles a wealth of otherwise scattered information into a remarkably lucid, interesting review. A chapter by Murphy is rather disheartening: technical difficulties, species differences, the lack of histological controls obviously make the effects of olfactory impairment on reproduction full of contradictions and uncertainties. The question is whether pedantry is not at play.

Anybody who has taken a dog for a walk cannot have failed to be impressed by the persistence, fussiness and seriousness with which these animals go about their urine-marking, veritably squeezing themselves to dust as they come up to yet another lamppost. Bronson shows patently that male mice are not very different from dogs in this respect and together with Ching Tse Lee, Rogers and Beauchamp attempts to show what the causes and the often drastic consequences of all these efforts are. It is a pity that it is done in three separate chapters. Each of them overworks a rather narrow scientific niche but cannot avoid considerable overlap. The picture that emerges might be useful to the specialist but must be somewhat confusing for the average reader. An interspersed multiauthored chapter examines how the pheromone concept has stood up to the test of time. Apparently not very well but the argument is largely a semantic one, hardly very productive. Richmond and Stehn's separate chapter for the microtine rodents seems warranted in view of the fact that unlike the murine gnawers, their females are not sexually cyclic. Nonetheless, they do not seem to be all that different in the way they read their males' scents. The reviewer remembers publications reporting olfactory species and subspecies recognition in voles but these are not mentioned. The ungulates are treated by Grau and their olfactory communication is obviously highly complex, involving appropriate glands by the dozen. Accordingly it would seem that the effect of any single scent signal is less drastic than those observed, say, in mice. Olfactory imprinting, however, makes its appearance — reminding the reviewer of childhood experiences with the phenomenon. Argentine gauchos used to cover orphaned calves with the skins of calves that had died, thereby inducing the mothers of the dead to accept the orphans in spite of their somewhat clownish and bloody appearance. Signoret specifically reviews chemical communication among domestic ungulates but restricts his attention to sexual behaviour. It is a neat, to the point chapter, perhaps reflecting the fact that here the topic of the book has economic relevance!

Needless to say the primates are, olfactorily speaking, a pretty confusing lot. Contradicting experimental results are in the fore, odorous personalities demonstrably confusing the issue. Epplé aptly writes of "chemical fingerprints". Continuing rather unexpectedly, dogs are placed between primates and man, perhaps because they are the latter's best friend. The conclusion that Anisko reaches about the functions of canid territorial urine-marking could equally well apply to birdsong. This kind of convergence of signalling channels, however, is not discussed. The final human chapter by Doty deals with hormone

dependent olfactory sensitivities to specific substances for which there is plenty of evidence, which sometimes is even consistent. Remarkably, neither here nor elsewhere in the book is anything said about the mechanism by which this kind of phenomenon might come about.

All in all this is a useful volume, assembling much interesting information in a reasonably readable form, certainly better edited than most comparable multiauthored books. Vertebrate olfactoethology/endocrinology clearly is a difficult field to work on. Nonetheless, one misses the frontal attack: do certified olfactory structures pick up hormones? If so, do these modify their functioning? Do confirmed neurosecretory nuclei receive olfactory inputs and if so, do these affect their activity? What might the selective pressures have been that have brought about all this variety of chemical communication?

JUAN D. DELIUS
(Bochum, Federal Republic of Germany)