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Neural Networks & Animal Behavior. By MAGNUS ENQUIST & STEFANO GHIRLANDA. Princeton, New Jersey: Princeton University Press (2005), Pp. ix+253. Price £26.95 paperback.

There are many who view neural networks simply as abstract models to investigate properties of neural systems or tools for statistical data analysis. Although other areas of science and technology have embraced neural networks, our field has been reluctant to adopt such tools. Readers of this book, however, will be left in little doubt that neural networks could become an important tool for studying animal behaviour, and its application must be encouraged. Neural networks will not appeal to everyone, nor will they have useful application in all areas of research. Indeed, by the authors' own admission, simple neural networks may prove to have restricted utility, but the small body of work done to date shows promising signs and suggests the feasibility and usefulness of neural networks is far from decided. Enquist and Ghirlanda have presented neural network modelling in an easy to follow manner, making it accessible to a broad spectrum of researchers. They describe how such models have been used, and explain how they could be developed to replicate experimental findings. In so doing, they have presented a clear case for the use of neural networks in understanding behaviour.

The book is divided into six chapters, commencing with introductions to the study of animal behaviour and neural networks, and then describes the application of neural network models to a wide variety of topics within animal behaviour. Their descriptions are intuitive, and likely to be accessible to advanced level undergraduate and postgraduate students as well as more established researchers. Each chapter concludes with a summary of the key points presented within the chapter as well as a reference list for relevant further reading. Readers will also find useful the comprehensive bibliography and subject index provided at the end of the book.

The first chapter provides background to studying animal behaviour and particularly the conceptual framework upon which all models are described, the 'behaviour map'. This is followed by an overview of the neural network methodology. For many who flip through the pages of this chapter, the prospect of dealing with more than 50 mathematical equations will encourage them to heed the authors' advice and skip most of this chapter (see Preface). However, the real value of this book will be realized if readers make an effort to understand the technical side of this research tool. That being said, the presentation of mathematical equations is done in such a way that readers are eased into the more complicated algorithms. This is one of the more straightforward introductions to modelling that I have read.

The central chapters of this book describe the application of neural networks to three familiar subject areas within animal behaviour: mechanisms, learning and ontogeny, and evolution. The first of these chapters focuses on the properties of a behaviour map and include stimulus control, sensory processing, decision making and motor control. The next two chapters deal with changes to the behaviour map. Unlike the preceding chapter which deals with input–output relationships, the next two chapters examine the way in which these relationships are modified through learning and development, as well as the process of evolution. Both add complexity to the modelling process. As a consequence, the models presented are not well developed and only begin to replicate the many different experimental findings and knowledge; a point that the authors make from the outset. The chapter summary for 'learning and ontogeny' provides an overview of what the authors feel is adequately represented in neural network models to date, but also what remains to be done. Similarly, the evolution chapter is described as speculative. Enquist and Ghirlanda admit that there is still no clear picture of the role that these models will play in understanding the evolution of behaviour.

Notwithstanding the limitations of some of the work described, this is a timely contribution to the field that should mark a turning point in the use of neural networks in animal behaviour research. It is likely to motivate animal behaviour researchers to explore further neural network applications in their own research. Importantly, it is also likely to generate interest among those well versed in neural network methodology, presenting a new forum for them to apply their knowledge and skills.

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Hormones and Animal Social Behavior. By ELIZABETH ADKINS-REGAN. Princeton, New Jersey: Princeton University Press (2005), Pp. xvi+411. Price £29.95 paperback.

'Mice live fast and die young, producing large litters in rapid succession if they survive at all. Elephants live slow and die old, producing a single offspring at long intervals. A male anglerfish spends his entire adult life attached parasite-style to a female whose size dwarfs his, and neither sex reaches maturity until it finds the other …' In a world where genomes are 'tickled', siblings 'be damned', and the 'irony of nature' provides a vertebrate with changeable sex type, one cannot help but delve deeper into Adkins-Regan's review of hormones at work.

With this book Adkins-Regan takes us on a tour through current concepts, theories and hypotheses in behavioural endocrinology. The focus is on naturally occurring social behaviour, and the network idea of behaviour, that includes the interaction of an actor with other individuals. Hormones (predominantly steroids) are presented as coordinators of reproduction, of suites of physiological and behavioural components, of different parts of the brain, and of brain with body. The book progressively builds up from the internal hormonal mechanisms in