

THE DEVELOPMENT AND INTEGRATION OF BEHAVIOUR: A TRIBUTE TO ROBERT HINDE

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The development and integration of behaviour: Essays in honour of Robert Hinde, edited by Patrick Bateson, Cambridge: Cambridge University Press, 1991.

The Development and Integration of Behaviour is a very well-edited commemorative volume honouring almost half a century of Robert Hinde's scientific work. The distinguished scholars, including a Nobel laureate, who have contributed to the book represent a wide range of backgrounds: ethology, ecology, psychology, psychiatry, and neuroscience. The multidisciplinary nature of the book exemplifies the need for cooperation among scholars from many different disciplines in order to further the study of the "development and integration of behaviour." This, appropriately, is the title of the book, and also the name of Hinde's research unit at Cambridge University. It is exciting and stimulating to see scientists with different backgrounds, and therefore greater knowledge and expertise than any individual alone can provide, unite to attack these scientific problems.

This book is important because the contributors provide invaluable information for all those interested in the biology of behaviour; it is unique because the person honoured provides stimulating and cleverly-argued commentaries on these contributions. Therefore, it is also an interesting example of Hinde's definition of "process."

Personally, I would like to take this opportunity to acknowledge my

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own indebtedness to Robert Hinde - for his teaching and his personal generosity. I am lucky to have had the opportunity to experience and learn from Hinde's wise counsel and rigorous, seminal thinking during his visits to my Department and his participation in scientific meetings on the brain and aggression organised by my research team. He was one of the main contributors to the Seville Statement on Violence, the result of an interdisciplinary meeting of scholars from all continents convened by me under the auspice of UNESCO. Together with Jo Groebel, we co-edited a book, *Essays on Violence* (1987), which may be regarded as the first volume of Hinde's trilogy on violence, war and co-operation. The other two books are *Aggression and War* (1989) and *Cooperation and Prosocial Behaviour* (1991).

Because of my personal involvement with Hinde, I shall not limit myself to a standard book review, but rather take this opportunity to stress some of his main ideas, which are also included in the present volume. This seems most appropriate because, to use the words of Hinde's former student, Jane Goodall, whose field studies with chimps in Tanzania are known the world over, he "will surely take his place as one of the giants of our times" (p. 470).

One of Hinde's most important contributions to science is his continued attempt to develop coherent links between theory and data. His penetrating new insights have given rise to conceptual clarification of behavioral processes and developmental psychobiology. He has also provided a change in the framework of inquiry which is most illuminating. It may be best to treat the empirical and conceptual divisions concerning patterns of behaviour as heuristics leading to a deeper understanding not truths in themselves. An important guide for research is to adopt a balance between analysis and synthesis.

The illustration on the cover of *The Development and Integration of Behaviour* depicts the species that Hinde has studied most extensively: a bird, representing his earlier ornithological work on song-learning and filial imprinting; a monkey, indicating his research on the development of social behaviour; and two children, representing his most recent work on mother-infant relationships that extends his analysis of social structure to humans.

The sections of the book clearly reflect the themes of Hinde's scientific work: behavioural development; behavioural neuroendocrinology; social behaviour, and its development in human and nonhuman primates; aggression and war. As well, there is an introduction by the editor and a final section with personal memoirs - by Niko Tinbergen and Jane Goodall. Hinde's very-appropriate commentaries conclude each section. A summary of Hinde's research career and a short history

of the Subdepartment of Animal Behaviour at Madingley are included in appendices.

The book begins with two notable ethological examples of behavioural development in birds: imprinting and song-learning. Patrick Bateson discusses imprinting, and illustrates how the complexities of development might be made more tractable by uncovering principles that make sense of that complexity. One of his conclusions is that the traditional nature-nurture dichotomy is useless. Peter Marler discusses the interplay between the developing bird and its environment, using as an example song-learning in different species. He emphasises the importance of understanding the rules that underlie developmental processes and the crucial influence of genetic factors in generating differences between species.

The next section is dedicated to neural and endocrine aspects of behaviour. John Fentress, in an optimistic attempt to reassemble the integrated organism, takes a neuroethological approach, stressing the importance of a bi-directional perspective in the interconnection between behavioural and neural analysis. His general point is elaborated further in the following chapters. Gabriel Horn uses imprinting in chicks to illustrate how the interconnections between different levels of analysis are made in practice. Reporting work with both birds and mammals, John Hutchison links the behavioural analysis of courtship with the biochemical techniques of neuroendocrinology; i.e. whether or not a behavior pattern is expressed depends on brain enzymes, which in turn depend on the animal's state, which in turn depends on environmental conditions. Richard Andrew comments on the various actions of testosterone on behaviour; for example, it makes animals less distractible perhaps by increasing attention span. Finally, by extending his intensive research in rodents to primates, Jan Rosenblatt attempts to find more general principles of the organisation of behaviour and demonstrates the value of a comparative approach to the study of maternal behaviour.

The section on social organization in non-human primates begins with Tim Clutton-Brock's comparative study of the mating system and its ramifications for other aspects of the biology of the species. He too stresses the influence of environmental conditions. In her chapter, Thelma Rowell suggests the importance of treating animals as individuals, instead of as universals, when analysing different levels of behaviour. Finally, using human examples, Michael Simpson offers a valuable insight concerning commitment in social behaviour.

The first three chapters of the section on the development of human behaviour are dedicated to the long-term effects of mother-child relationships. John Bowlby tries to integrate psychoanalytic and

ethological concepts; Joan Stevenson-Hinde defends a dynamic interplay between attachment and temperament, rejecting its traditional and unfortunate dichotomy; and Michael Rutter considers the negative long-term effects of maternal deprivation on adult behaviour. The last two chapters of this section, by Judy Dunn and Marian Radke-Varrow, respectively, demonstrate the valuable methodological contribution Hinde's ethological work with animals has made to research in child development.

Finally, David Hamburg, in the section on human aggression and warfare, hopes that the human capacity to adapt to new conditions may be enhanced if we know more about evolution. Violent behaviour may be controlled, if we can understand the conditions under which it is likely to be expressed (see also, Ramirez, 1994).

One of Hinde's continuing messages, endorsed in this book by old friends and students, is that "even though the move in every subject is towards greater specialisation and towards reducing large problems to smaller ones at lower levels of analysis, satisfying explanations are rarely going to come from one method or a single theoretical framework" (Bateson, Chapter 1, p.14). To achieve understanding scientists need to "cross and recross" - to use one of his typical expressions - the boundaries between different levels of analysis and disciplines. This means having a more problem-oriented focus, as Hinde does with his fertile, eclectic approach.

Since this review is for the *International Journal of Comparative Psychology*, it seems appropriate to acknowledge Hinde's immense contribution to the synthesis of ethology and comparative psychology, expressed in his now classic book *Animal Behaviour* (1966). Here he pointed out the continuities between seemingly diverse ideas, uniting them into a complex whole, with a wide range of mediating processes. Hinde stressed to his students the importance of a comparative approach to the study of behaviour, while never neglecting the study of species differences; the need to integrate data from different groups of animals; and the idea that advances in understanding animal behaviour may lead to questions that will eventually help us to understand ourselves. An interesting example of this last assertion is Simpson's imaginative insight on declaring commitment to a partner (Chapter 11). Hinde also made the important suggestion that research on animal behaviour should be approached separately from the four classical perspectives of ethology: causation, development, function and evolution; and that these approaches may be mutually beneficial. For example, functional considerations can help us answer developmental questions, and causal analysis can contribute to evolutionary studies.

Thanks to Hinde's penetrating new insights, the internecine strife and sterile controversy between ethology and comparative psychology has largely disappeared. Hinde (1982) himself admitted that "aggressive overtures are common on interdisciplinary boundaries, and I erred in that way myself. In the long run, of course, liaison must depend not on territorial invasion, as I implied, but a mutual welcome for those who cross no-man's-land" (1982, p. 16). One now may suggest, using Bateson's rather apt expression, that "Cinderella has finally arrived at the ball" (Chapter 2, p. 37).

To summarize, this book is proof that a liaison between different disciplines can take place, and in a fertile manner. Moreover, the utility of the ethological approach to the biological and social sciences is strongly supported. The very challenging and diverse contributions presented here are of great interest and importance for all students of the biology of behaviour.

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