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Problems in the Behavioural Sciences

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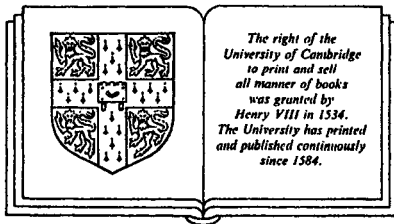
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To Julie

La Coeur a ses raisons que la raison ne connaît point
Emotion has its own reasons about which reason knows nothing at
all

Blaise Pascal: Pensées (iv, 277 – Brunschvicg)

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Preface

The impetus for this book came when I was delivering a series of undergraduate lectures on emotion to psychology students at the University of Oxford. I was unable to find what I considered a suitable basic text for the course. The available books consisted almost entirely of presentations of particular theories of emotion. It struck me as strange that any field of science should have such a multiplicity of theories – except for the fact that in many cases different theorists were addressing different data bases. What seemed to me to be lacking, therefore, was a general pretheoretical framework into which all of the relevant data could be fitted.

This book is an attempt to provide such a framework. It does not present a specific theory of emotion, although it might bias one in favour of some theories rather than others. The central idea of the book is that biology and particularly evolution provide the best starting point for the study of emotion. This idea is neither novel, since it is the basis for Darwin's work, nor is it unrepresented in current theorising (see particularly Plutchik's various works). However, I do not think its implications have ever been considered outside the bounds of specific theorising. In particular, I have tried to show that all of the conventional properties of emotion such as expression, feeling, and motivation can be considered in a scientific manner and useful conclusions drawn therefrom. For some reason the study of emotion, even now, is bedevilled by reports which are remarkably poor from a scientific and particularly a biological point of view – even when their statistical expertise and basic experimental design are formally correct.

It should be emphasised that the book is not intended as a comprehensive review of any of the areas of emotion it covers. This would have required a much larger book, and the inclusion of general review material would have obscured the central theme. Specific aspects of emotion have usually been discussed only in terms of a limited number of emotions. However, in discussing the different aspects of emotion I have attempted to cover a range of emotions. I hope that the general approach taken in the book will safely allow expansion of the ideas to other emotions to be left as 'an exercise for the student'. While it does not have the usual form of a text, and is not intended primarily as one, I hope the book has been written clearly enough to be useful to under-

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graduates. I have, myself, used parts of it as the basis for a second year undergraduate course.

In Chapter 1 I discuss the problems which arise from the lack of a satisfactory definition of emotion in psychology. I suggest that a biological and particularly an evolutionary approach to the subject can circumvent many of the problems of definition. I then describe briefly some of the historical approaches to emotion which have led to the modern areas of research reviewed in later chapters. In this context, I should comment on two specific omissions from the book of what might be thought appropriate to the analysis of biological aspects of emotion. The first is the work of Freud. It can be argued that Freud has made a major contribution to the theoretical analysis of emotion. However, the book as a whole attempts to avoid theory and, in particular, Freud's work does not appear to me to provide the foundation for any distinct and fruitful area of modern objective data collection. The second omission is that of essentially neurophysiological theories (e.g. Papez, 1937; Pribram, 1970) and data. This is not because analysis of brain mechanisms is not relevant to emotion, but because it is necessary to decide, via psychology, what are the important elements of a behavioural system before neurophysiology and anatomy can take one very far. Chapter 2 deals with some highly selected neurophysiological observations which help to clarify basic issues. However, a proper physiological analysis of the behavioural systems discussed here would require several additional volumes.

The central points derived from the brief discussion of brain mechanisms in Chapter 2 are: 1) that effector programs (that is to say, integrated responses of glandular, autonomic, or motor system – including facial expressions and directed actions) can be viewed as being released (or triggered) by internal or environmental stimuli; and 2) that certain states of the organism can be viewed as enabling a range of different effector programs rather than unconditionally producing a specific one. The innate elements of such programs would be subject to selection pressure, and, in Chapter 3, I develop the suggestion that a useful *working* definition of specific emotions can be arrived at by considering the coincident evolutionary pressures that may have shaped the control of the various components of emotional reactions. The advantage of such a working definition is that it does not prejudice either a final definition of any particular emotion, or the question of whether different components of emotional reaction share a common central controlling state.

In Chapters 4, 5 and 6 I discuss the form of emotional expression provided by systems designed to communicate between individuals

(particularly those controlling facial expression) and those provided by autonomic and hormonal systems which can be seen as systems which communicate between mental state and basic physiological systems. The innate aspects of the systems, viewed as clusters of released reactions, are emphasised in these chapters and the way in which they could have evolved is discussed. It is argued that, in many cases, what are now important reactions psychologically have their origins in reactions which originally evolved in response to basic physiological selection pressures. In Chapter 7 I consider in depth an example of the type of psychological factor which could exert pressure on a pre-existing physiological reaction and emphasise the difference between the nature of the selection pressure, for which a theorist may be able to discern some optimal adaptive strategy, and the number and variety of 'rule of thumb' mechanistic strategies which may concurrently satisfy that selection pressure.

In Chapters 8 and 9 I consider the role of development and learning in emotion as an antidote to the idea that the innate basis of emotional reactions could mean that the form of such reactions in adults is rigidly fixed. In Chapter 9 I consider in particular the status of emotion within learning theory and argue that emotion and motivation should be seen as discrete entities. I also suggest that the methods of the 'behaviour analysts' are particularly suited to the analysis of cognitive strategies in differing species and to the analysis of the extent to which we can validly refer to central states of the animal when discussing emotion.

In Chapter 10 I describe a number of interactions between expressive, autonomic, hormonal, directed skeletal (motor), and cognitive systems in emotion. These had been considered in isolation in previous chapters. I conclude that there may be sufficient interaction between the different components of emotion to justify the use of specific emotion labels, but that control of those components by some single central state remains to be demonstrated for specific emotions.

In Chapter 11 I discuss the vexed question of how far results from one species can be generalised to others. While I acknowledge that each individual species is unique, I conclude that there is no reason to treat humans, within biology, in a different way from any other species.

In Chapter 12 I discuss the application of the ideas presented in the earlier chapters – with particular reference to the dangers of too hasty an attempt to provide an explanation of emotion. The tendency of theorists to dichotomise continua (e.g. nature–nurture) is a particular problem in this area. My final conclusion is that an attempt to achieve an exact definition of emotion, in general, or of any specific emotion,

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in particular, is premature. However, a biological approach can allow integration of data and can frame valid experimental questions about emotion, even in the absence of such definitions.

This book covers a wide range of topics. In attempting to cover them without making too many blunders, I have sought criticism from a number of colleagues and have benefited from casual discussion of the issues raised in the book with many more. It is usual to absolve one's colleagues from any responsibility for the material in the text. This is particularly necessary in the present case since I was frequently helped by those who specifically disavowed any agreement with my conclusions, while being lavish in their advice as to how better to present the arguments for them.

Acknowledgements

During the writing of this book I have enjoyed the stimulating atmosphere provided by my colleagues in the Department of Psychology at the University of Otago. Whatever the topic under discussion, their enthusiasm for the scientific approach to psychology has encouraged me in my work. Of those whose discussion directly contributed to this book, I owe a particular debt to Graham Goddard. His steadfast refusal to believe that 'emotion' was a topic which had any place in modern psychology bolstered my resolve to complete the book and affected the level at which I pitched a number of the arguments. His contribution to the central ideas of the book – the 'state dependent reflex' – can be judged by the reader. The invigorating departmental atmosphere at Otago is a direct result of his efforts as chairman of the department. His recent tragic death in a tramping accident is a loss both to his department and to the scientific community at large. I hope that this book and other scholarly work from the department in the future will act as a fitting memorial to him.

A number of people read drafts of specific chapters: Cliff Abraham, Derek Blackman, Mike Davison, Louis Leland, Gay Maxwell, Mel Pipe and Gill Rhodes. Chris Linsell and Ed Kairiss both read the entirety of the first draft. All of them offered most useful advice and suggested many modifications and corrections. Many undergraduates taking my course on biology and emotion at Otago have offered specific advice and criticism. I have also been fortunate in my editor, Jeffrey Gray. His capacity for informed disagreement during my years at Oxford shaped many of the ideas which ultimately led to this volume; and his diagnosis of the ills which afflicted the first draft played a major part in the present form of the book. Julie McNaughton read the entire book and offered considerable literary advice which I have attempted to follow. Any clarity of expression the book may have is owed to her. Euan McNaughton generously provided many first-hand data which considerably influenced my views on the development of emotion in the neonate.