DEVELOPMENTAL AND CELL BIOLOGY SERIES 24
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THIS SIDE UP

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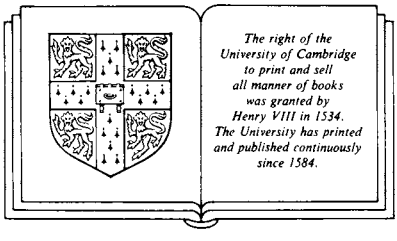
THIS SIDE UP

SPATIAL DETERMINATION IN THE EARLY DEVELOPMENT OF ANIMALS

ROBERT WALL



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Contents

Preface

My work for this book really began 20 years ago when I worked for the late Professor C.H. Waddington producing summaries of current research on development. I became particularly interested in the origins of spatial patterns, where I felt that I could detect signs of common features in many different developing systems. Since that time I have tried to make notes on all published studies of early development as they appeared, whatever the animal group concerned. I have also gone back in time to look again at many seminal studies published up to 100 years ago.

In selecting from this huge literature, I have been guided mainly by the principle that the work should have a potential relevance for the spatial determination problem. No doubt I have failed to 'pick the winners' in some cases, but the alternative was to risk losing the thread in a book of unwieldy size. My choices will seem to many to be particularly idiosyncratic in the physiological and biochemical sections, where I have presented some classical data (the meaning of which is still unclear) while omitting some modern studies. I justify this on the basis that the former will one day have to be encompassed in theories of spatial determination, while the latter may prove not to be relevant and have in any case been considered in depth in Davidson's *Gene Activity in Early Development*.

At the present time, the data relevant to the spatial determination problem still derive primarily from experimental embryology, and this is reflected in this book. In several cases I have assessed particular approaches to the problem first by considering data exclusively obtained with a particular much-studied group, and then in a comparative survey of other animal groups. For example, concepts of determination based upon intercellular signalling are considered first for sea urchins, and then extended to other embryos including that of *Drosophila* where we seem at last to be uncovering a molecular basis for developmental phenomena. Molecular data are presented quite fully in such cases (although the survey of literature for this book was completed at the end of August 1987), and the final chapter considers the evidence for common mechanisms as well as common patterns in determination.

Acknowledgements

I have worked as a teacher while writing this book and have been grateful for the flexibility of colleagues in London and Bedfordshire which has allowed me to find the time to complete it. Barry Shephard helped to make it possible for me to study in London. I have used a large number of public libraries in researching this book, and would like in particular to acknowledge the help of the libraries at the Open University and University College London as well as branches of the Science Reference and Information Service. Dr Glyn Williams of University College London also helped me to trace Hofmeister's studies of colloids and later developments of the work. My greatest debt is, however, to my good friend Richard Black who, among other things, has given me innumerable lifts to the Open University, typed and retyped the manuscript on a word-processor and helped me to photograph many of the figures. Other photographs were prepared at Cambridge University Library. Dr Jonathan Slack read and made many helpful comments upon two different drafts of the book, but cannot be held responsible for my final decisions on its content. Much advice and encouragement also came from Dr Adam Wilkins at Cambridge University Press. I apologise to my wife and family for the times when the work has made me uncommunicative or miserable, and thank them for their help and forebearance.

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