Preface

THIS book is based on a set of six Jesup Lectures, given at Columbia University during April and May, 1961. An invitation to contribute to a series as well known as this faces its recipient with a somewhat daunting challenge. He is, I suppose, expected to produce something new; something, moreover, which falls a bit outside the regular well-charted paths of scientific advance of which everyone is already fully aware; and finally, something of his own. My attempt to meet this challenge takes the form of a discussion of two problems, one rather new and one very old. The new problem is the impact of the recent great advances in genetics on our understanding of the development of multicellular organisms. This subject has often been touched on by geneticists but has received less attention from authors who are fully conversant with the embryological material. The old problem is the ancient conundrum of morphogenesis—the appearance of organized structure within a vast range of sizes from the cellular organelle to the elephant. Present-day biology, which is dominated by the enormous successes of biochemistry, has tended to neglect these structures which are too large to be handled by biochemical methods; but they still confront us as one of the most insistent and least understood characteristics of living things. Some may feel that the sensible thing to do at present about these structures is to leave them alone in hope that the progress of biochemistry will eventually throw up some new clue; but to others, including myself, they have the attraction of a real frontier, a region where one is not just trying to fill in an already existing sketch map, but where one has to try to figure out the bare bones of the geography from scratch.

A short set of lectures such as this cannot, of course, attempt to be comprehensive in the treatment even of the topics chosen for discussion, and the desirability of describing some of the work of my own laboratory

has led to what would have been an even greater imbalance if I had set out to give a general survey of modern embryology. I have, for instance, consciously left out many important topics on which the main recent contributions have been made by American biologists, since these are matters which scarcely need exposition by a visitor.

There is today in America a great flowering of developmental cell biology as well as of genetics. To an outsider it is perhaps surprising that there is not more contact between the two fields in this country; but I should not like my friends in either camp to feel that the omission from this short series of lectures of many of the topics nearest their hearts is due to any lack of appreciation on my part of the magnificent advances which are being made.

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