Foreword

by A. M. DALCQ

Several journals, formally dedicated to zoology, morphology, anatomy, cytology, or biology, more rarely to embryology, are already open to the publication of studies on development. Nevertheless, the need for a new periodical which would be primarily devoted to morphogenesis has been felt in recent years by many embryologists. Professor Woerdeman, in particular, tackled this problem immediately after the last war, but the conditions of the moment did not allow him to realize his fine scheme. In the meantime, our Japanese colleagues took a similar initiative and founded, in 1950, their journal Embryologia. In Europe there is certainly space for an enterprise run on an international scale. Accordingly, all students of morphogenesis will be grateful to the British embryologists for having taken over the project of their Dutch colleague. Professor Woerdeman willingly put the results of his preliminary inquiries at the disposal of the British group, which he soon joined. His collaboration is the more important in that he is the Chairman of the Institut International d'Embryologie, a foundation playing a prominent and constantly increasing role in our scientific movement.

By progressive co-option, the group of sponsors soon grew to the present Editorial Board. Thanks to the assistance of the British Council, most of its members held an inaugural meeting early in the present year. Arrangements were made for the publication of the new Journal of Embryology and Experimental Morphology by the Company of Biologists Ltd.; and the Wellcome Trust has greatly facilitated the task of starting the journal by offering the Company a generous guarantee against financial loss during the first two years of publication.

This new instrument for forwarding scientific information and co-operation will probably answer to the wishes of many embryologists. When they take a bird’s-eye view of the work accomplished in their field during the first half of this century they can perceive a curve of activities which reveals, in spite of two sad interruptions, a constant expansion. If, as every scientist heartily wishes, the coming years are favourable to peaceful and disinterested laboratory life, the progress of our studies could well outrun all former estimations. Indeed, the great anonymous opus, which the science of development strives to be, is experiencing a tremendous phase of growth and differentiation.

The period where the gross aspects of development had simply to be described is coming to an end, although much remains to be done in some groups. But new tasks constantly appear as much on the purely embryological level as when recourse is had to the methods of neighbouring sciences. One characteristic of the
present period is a certain temporary prevalence of observation at the expense of experimentation. Many of us feel strongly the necessity for a better understanding of the germinal protoplasm, for a more precise knowledge of its physical and chemical organization which must be in some way responsible for morphogenesis. But each step in the appropriate use of cytochemical reactions, or of the improved physical means of observation now at our disposal—optical, photometrical, photo-electrical, electronic, radio-electrical, and other devices!—entails a series of cautious inquiries, involving regular publication of papers.

For those who still feel more tempted by experimentation, the same technical requirements unavoidably weigh upon the rhythm of progress and increase the probability of frequent publication. In both observation and experiment the recourse to biochemistry has become a perpetual preoccupation. In spite of the immense work already performed, it must be admitted, provisionally, that some crucial aspects of early morphogenesis, those bound up with field relations and induction processes, still escape our range of attack. However, the use of the most sensitive methods of immunology and of radioactive tracers immediately awakens new hopes, and this too promises a serious output of special contributions.

It is also obvious that embryologists will now be confronted with an extraordinary extension of their field in depth, in space, and in time.

In depth, owing to their constant wish to reach to the macromolecular level, a tendency which does not need to be stressed.

In space, according to circumstances which require some comment. On the one side, it appears that we are on the verge of establishing the common denominator of morphogenesis in regeneration and asexual reproduction and in embryonic development. The recent confirmation of real induction processes in regeneration seems to be a decisive step in this direction.

On the other hand, a tremendous programme of investigation is called for concerning mammalian development. These eggs put before us the problems of morphogenesis in their very barest and most powerful aspects, but also under the most difficult conditions for the gathering of material and for the methods of manipulation. This present task remains within the evolutionary line of our discipline. The pioneers of the last century had their attention mainly focused on mammals. Then, owing to the technical difficulties encountered and to the need felt for a broader inquiry, this group was, for a while, more or less neglected. It will be to the lasting honour of the Carnegie Institution that it gave to the late Professor George L. Streeter the means to ensure the renewal of these studies, as he did in the Baltimore Department of Embryology. The invaluable collections gathered under his enthusiastic guidance, and with the marvellously efficient collaboration of Dr. C. H. Heuser, have contributed greatly to bring back our attention to the development of man. Indeed, we can still assert that the factual event of human ontogeny represents, in spite of such appreciable advances, our major problem. But to attain this goal, many direct—in so far as is permitted by
our ethical rules—and comparative studies will be necessary. Wild mammalian species of all continents need accurate investigation. This is the more difficult in that the classical methods of fixing and sectioning have generally become insufficient; field laboratory work should be organized for that purpose. Perhaps it is well to remind oneself that the morphogenetic abilities of mammalian and human protoplasm refer to properties which are scarcely noted in our current manner of considering cellular life. These barely known activities could well be of some medical interest.

It is also from a mainly human point of view that we may claim for our researches an extension 'in time'. This is likewise the result of an evolution which has gradually effaced the conventional boundaries between the biological phases of life. After the initial prospecting of early or embryonic stages attention has gradually shifted to the processes of cytodifferentiation—which are only beginning to be explored and faintly understood—and then to growth with its subjacent synthesis of living and inert materials. Now, it becomes plausible that, to a limited but important extent, the forces controlling morphogenesis remain active in the processes of cell-replacement, proliferation, differentiation, and ageing which constantly take place behind the apparently stable frontage of the organs. Such insidious changes leading to structural reconstruction offer dynamic aspects in direct relation with those of early development, and something might probably be won by studying them from the same angle.

These general previsions could perhaps be thought ambitious for a discipline which is still considered by many scientists as an auxiliary one. We are more probably underestimating the situation, for unforeseen aspects will certainly come to light, owing to the exceptional scope and position of our problem. It is not necessary to emphasize here that eggs, buds, and germs of all kinds are, as it were, condensers of life activities. For that reason our researches, together with those of the geneticists, really touch the root of all biological problems. Perhaps it is permissible to think that they have a still wider meaning when we read from the hand of a well-known physicist: ‘Form, not substance, the fundamental concept.’

But the broader the implications of our investigations, the more it is necessary to foresee some limits to the hospitality of this journal. The Editorial Board has agreed to accept contributions which aim at the general goal of exploring more thoroughly how living, non-pathological structures are built up, increased, maintained, repaired, transformed, either at the supracellular, or cellular, or macromolecular level. Most of the published works will concern the animal realm, but it is planned that occasional papers or reviews may throw out a bridge towards morphogenesis in unicellular and plant organisms.

With this comprehensive orientation, the Journal of Embryology and Experimental Morphology hopes to help the gradual elaboration of a synthetic view on the intricate processes of morphogenesis.

Conscious of the gratitude they owe to their predecessors and senior colleagues, the members of the Editorial Board wish to dedicate this new journal to some of the prominent embryologists who have during their long careers made such patient, painstaking, and successful efforts for the progress of our science. In France, Professor Paul Ancel, who has been both one of the pioneers in sexual endocrinology and a wonderful experimentalist on early stages; Professor Maurice Caullery, whose indefatigable zeal for our discipline has inspired the vocation of several distinguished morphogeneticists; in Germany, Professor Karl Peter, who has added so many extensive and precise contributions to our knowledge of the amniotes; in Great Britain, Professor James P. Hill, whose outstanding works have brought to light major aspects of protherian, metatherian, and eutherian development; in Italy, Professor Giuseppe Levi, who, by his cytological researches, especially by his cultures of embryonic cells, has evoked a group of well-known students of morphogenesis; in Sweden, Professor Nils Holmgren, whose researches splendidly demonstrate the persistent value of comparative embryology; in the United States, Professor Charles Manning Child, whose creative thought, based on innumerable new data, instilled into the interpretation of development reinvigorating concepts; Professor Ross Granville Harrison, whose unimpeachable experiments have unravelled several riddles of amphibian development; Professor Warren H. Lewis, who has constantly been at the vanguard of investigators exploring the early stages of vertebrates. All of them have been the colleagues and often the friends of other great embryologists who unfortunately can no more hear our words of thanks. These late masters and pioneers of our discipline still live in our memory and the quotation of their memoirs and books is a lasting tribute to their value.

After these lines of dedication, we have only to wish God-speed to the new vessel we are daring to launch. May it be welcomed by all those in the world who study the fascinating problem of morphogenesis!