

Paperback Re-issue

The development of the shapes of living organisms and their parts is a field of science in which there are no generally accepted theoretical principles. What form these principles are likely to take, when they emerge, is a subject in which there is a wide gulf of disagreement between physical scientists and experimental biologists.

This book contains both an extensive philosophical commentary on this dichotomy in views and an exposition of the type of theory most favoured by physical scientists. In this theory, living form is a manifestation of the dynamics of chemical change and physical transport or other physics of spatial communication. The reaction-diffusion theory, as initiated by Turing in 1952 and since elaborated by Prigogine and by Gierer and Meinhardt and others, is discussed in detail at a level that requires a good knowledge of a first course in calculus, but no more than that. In some respects this book takes up the theme that "the *things* which we see in the cell are less important than the *actions* which we recognize in the cell," which was a major theme of D'Arcy W. Thompson's classic 1917 work *On Growth and Form*. The rapid growth of the field of molecular biology has tended to overshadow the increase in our understanding of the nature of these kinetic processes. This book seeks to reawaken interest in dynamics in the hope that a better balance between the importance of things and the importance of actions may gradually emerge in the biology of the twenty-first century.

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Cover illustration: A computation, from Lyons and Harrison (1991), of the ability of the hyperchirality model to form stripes.

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