mind are currently under investigation; Helliwell describes these important studies in effective detail.

By describing the various ways in which synchrotron radiation can be used in diffraction studies of crystals, Helliwell has shown the enormous impact it can have on the elucidation of both the structure and the function of macromolecules. Anyone with an interest in macromolecular structure determination and enzyme mechanisms should consult this informative, well-produced, and profusely illustrated book. Those working directly in the field of macromolecular structure determination will find the volume indispensable.

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Anatomical Beginnings

Morphogenesis. An Analysis of the Development of Biological Form. EDWARD F. ROSSOMANDO and STEPHEN ALEXANDER, Eds. Dekker, New York, 1992. viii, 449 pp., illus. $165.

In embryonic development only a few days are required to transform a single cell, the fertilized egg, into a free-living multicellular larva possessing a variety of cell types that, in turn, are organized into the functionally adaptive patterns of the tissues and organs. Embryonic morphogenesis is the ensemble of processes that cooperate to organize the differentiating cells and tissues of the embryo into the patterned arrays that characterize the mature tissues, organs, and overall body form of the larva and the adult. Categories of morphogenetic process include morphogenetic movement, differential growth, morphogenetic cell death, and pattern formation. The embryo can move cells or tissues from one location to another (morphogenetic movement), can restrict increases in tissue volume to selected sites or along selected axes (differential growth), and can eliminate cells at selected locations (morphogenetic cell death). Undifferentiated tissues at various locations in the embryo can be stimulated to differentiate into the particular tissues destined to occupy those individual sites (pattern formation). Pattern formation itself encompasses a number of processes, including embryonic induction, the action of diffusible morphogens, and ooplasmic localization.

Our understanding of the mechanisms of embryonic morphogenesis has greatly improved in recent years, thanks largely to technical and intellectual advances in cell and molecular biology. The techniques of gene cloning, in situ hybridization, and gene transfection, coupled with a better understanding of the regulation of gene transcription, have made possible a molecular-genetic approach to understanding the spatially regulated cell differentiation that is the basis of pattern formation. Progress in the biochemistry of cellular adhesion has inaugurated investigation of directed cell motility in terms of specific molecules. The identification of peptide growth factors has advanced our understanding both of tissue growth and of embryonic induction.

In compiling this multiauthor volume Rossomando and Alexander have focused on the embryonic morphogenesis of specific organisms. The individual chapters of *Morphogenesis* are devoted to descriptions of the morphogenetic processes utilized by a wide array of organisms studied by experimental embryologists, including prokaryotes (the mycobacteria), lower eukaryotes (*Dictyostelium* and *Aspergillus*), and a variety of animals. The higher eukaryotes discussed include such stalwarts as hydras and the embryos of the fruit fly, sea urchin, amphibian, bird, and mouse. Important omissions include higher plants (*Arabidopsis*) and teleosts (*Brachydanio*). The quality of the individual reviews is high, even though the constraints of brevity conflict with the depth and breadth of current knowledge of morphogenetic mechanisms for many of the selected species. Noteworthy are the chapters on development of the embryos of tunicates, amphibians, sea urchins, and *Drosophila*. Tunicate development exemplifies the importance of ooplasmic determinants in subsequent tissue patterning; the sea urchin and amphibian embryos are especially well characterized with regard to the details of the morphogenetic movements of early development; and *Drosophila* is the best-characterized model for understanding the genetic basis for early pattern formation and embryonic segmentation.

Morphogenesis would have been improved by the inclusion of a synthetic chapter that reviewed the subject on the basis of morphogenetic mechanism and drew on examples from throughout the animal, plant, and microbial kingdoms, rather than centering around a particular organism. Despite this weakness, the volume will be useful for advanced undergraduate and graduate students and for university instructors seeking up-to-date reviews of embryogenesis of selected model organisms.

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Books Received

Aerosol Effects on Climate. S. Gerard Jennings, Ed. University of Arizona Press, Tucson, 1993. xii, 305 pp., illus. $40.

AIDS in the World. Global AIDS Policy Coalition. Jonathan M. Mann, Daniel J. M. Tarantola, and Thomas W. Netter, Eds. Harvard University Press, Cambridge, MA, 1992. xvi, 1037 pp., illus. $45; paper, $19.95.

Air Pollution Modeling and Its Application IX. Han van Dop and George Kallos, Eds. Plenum, New York, 1992. xii, 803 pp., illus. $165. NATO Challenges of Modern Society, vol. 17. From a meeting, Crete, Sept. 1991.

Biological Oxidants. Generation and Injurious Consequences. Charles G. Cochrane and Michael A. Gimbrone, Jr., Eds. Academic Press, San Diego, CA, 1992. x, 253 pp., illus. $69.95. Cellular and Molecular Mechanisms of Inflammation, vol. 4.

Biology as Ideology. The Doctrine of DNA. R. C. Lewontin. HarperPerennial, New York, 1993. x, 128 pp. Paper, $10. Reprint, 1991 ed.

Cancer Treatment and the Heart. Franco M. Muggia, Michael D. Green, and James L. Speyer, Eds. Johns Hopkins University Press, Baltimore, MD, 1992. x, 390 pp., illus. $125. Johns Hopkins Series in Hematology/Oncology.

Carp and Pond Fish Culture. Including Chinese Herbivorous Species, Pike, Tench, Zander, Wels Catfish and Goldfish. László Horváth, Gizella Tamás (Horváth), and Chris Seagrave. Blackwell Scientific, Oxford, and Wiley, New York, 1992. x, 158 pp., illus. $69.95.

The Chemistry of Life. Martin Olomucki. McGraw-Hill, New York, 1993. 132 pp. Paper, $9.95. Horizons of Science Series. Translated from the French edition (Paris, 1991).

Coherent Radiation Generation and Particle Acceleration. A. M. Prokhorov *et al.*, Eds. American Institute of Physics, New York, 1992. xviii, 511 pp., illus. $120. Research Trends in Physics. From a conference, La Jolla, CA, Feb. 1991.

Developmental Psychobiology. Gerald Turkewitz, Ed. New York Academy of Sciences, New York, 1992. x, 189 pp., illus. $50. Annals of the New York Academy of Sciences, vol. 662. From symposia, spring 1990.

Dictionary of Global Climate Change. W. John Maunder, compiler. UCL Press, London, and Chapman and Hall, New York, 1992. xxii, 240 pp. $45. Contribution of the Stockholm Environment Institute to the Second World Climate Conference.

Eastern North American Mesozoic Magmatism. John H. Puffer and Paul C. Ragland. Geological Society of America, Boulder, CO, 1992. x, 406 pp., illus. Paper, $78. Special Paper 268.

The Ecological Vision. Reflections on the American Condition. Peter F. Drucker. Transaction Publishers, New Brunswick, NJ, 1993. viii, 466 pp. $34.95.

Eight Little Piggles. Reflections in Natural History. Stephen Jay Gould. Norton, New York, 1993. 479 pp., illus. $22.95.

Fleeting Footsteps. Tracing the Conception of Arithmetic and Algebra in Ancient China. Lam Lay Yong and Ang Tian Se. World Scientific, River Edge, NJ, 1992. xvi, 199 pp., illus. $24.

Foundations of Philosophy of Science. Recent Developments. James H. Fetzer, Ed. Paragon House, New York, 1993. xviii, 512 pp., illus. Paper, $28.95. Paragon Issues in Philosophy.

Frontiers in Cognitive Neuroscience. Stephen M. Kosslyn and Richard A. Andersen, Eds. MIT Press, Cambridge, MA, 1992. xxx, 699 pp., illus. $70. Reprints, with general introductions, of 55 articles, 1962–1992.

Fungi in Vegetation Science. W. Winterhoff, Ed. Kluwer, Norwell, MA, 1992. x, 258 pp., illus. $109. Handbook of Vegetation Science, vol. 19/1.

Genetic Interactions Among Microorganisms in the Natural Environment. Elizabeth M. H. Wellington and Jan D. van Elsas, Eds. Pergamon, Tarrytown, NY, 1992. x, 303 pp., illus. $130.

Fleeting Footsteps. Tracing the Conception of Arithmetic and Algebra in Ancient China. Lam Lay Yong and Ang Tian Se. World Scientific, River Edge, NJ, 1992. xvi, 199 pp., illus. $24.

Foundations of Philosophy of Science. Recent Developments. James H. Fetzer, Ed. Paragon House,