ated, placebo-controlled trials may appear to do little except limit one's freedom to choose tried and true remedies. But these methods actually provide the consumer greater control over the risks and efficacies of ancient and modern preparations, many of which undoubtedly contain both powerful biological and placebo components.

The authors have tackled a timely subject, contrasting ancient testimonials and histories of use with modern controlled approaches for determining efficacy and risks of complex therapeutic mixtures. The former perspective forms the rationale for the current laws governing dietary supplements; the latter the premise for pre-market safety and efficacy approval by the U.S. Food and Drug Administration. One is left wondering whether, after understanding these principles, so many consumers would still rather return to the seemingly simpler, but clearly riskier, old methods—methods that do not distinguish placebo from therapeutic or potentially toxic effects.

ORGANISMAL BIOLOGY

Developmental Diversity

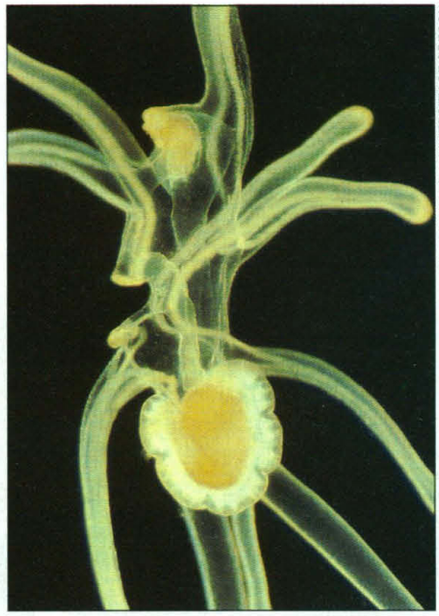
Richard Emlet

Embryology. Constructing the Organism. SCOTT F. GILBERT and ANNE M. RAUNIO, Eds. Sinauer, Sunderland, MA, 1997. xii, 537 pp., illus. $69.95. ISBN 0-87893-237-2.

How a fertilized egg turns into a functional individual is among the most fascinating and greatest of never-ending stories. Moreover, new organismic and evolutionary approaches and expanding molecular and optical techniques have revitalized a centuries-old interest in development of the diverse organisms inhabiting earth. Gilbert and Raunio have coordinated the efforts of selected experts to produce a comprehensive textbook describing current knowledge of animal development that even includes a chapter on development in flowering plants.

The editors' goals include presenting comparative information on development (at a level comprehensible to college sophomores), encouraging creation of new embryology courses, and providing details of structural pattern for additional upper level training in developmental biology. Given the tremendous variation among the more than 30 animal phyla and their classes, the modern explosion of knowledge about development in model organisms, the tightness of undergraduate biology curricula, and that such a comprehensive effort has not been made since the end of the last century, the authors face formidable challenges.

Two introductory chapters provide the basics on the structure and organization of eggs and embryos, body symmetry, larval function and ecology, and the evolutionary analysis of traits. The remaining chapters on different phyla or subphyla (16 on invertebrates and 4 on vertebrates) proceed as "stand alone" presentations. They are grouped into sections that represent levels of increasing structural complexity. Each chapter includes an overview of adult body plans, gametogenesis, fertilization, cleavage and gastrulation, larval structure, experimental embryology (when available), and some comments on evolution and development. Illustrations throughout are well done and extremely useful in portraying morphology, embryonic fate maps and structure, and often complex experimental manipulations and their results. A minor but recurrent problem is that symbols in some figures are not defined in the caption or explained in the text.



BRUCE MILLER / UNIVERSITY OF OREGON

Late stage larval sea star. The bilaterally symmetric brachiolaria larva of *Pisaster ochraceus* drifts in the plankton, capturing unicellular algae along the cilia-lined arms projecting from its body. After metamorphosis, the pentamerous juvenile (surrounding the orange larval stomach) develops into an adult that lives on the sea floor.

Many chapters will be valuable sources for developmental and evolutionary biologists; however, college undergraduates lacking knowledge of anatomy and function of animals and plants will experience considerable difficulties assimilating all the information. The wide variation in content and focus of individual chapters has as much to do with the authors and their freedom of choice as it does with the information available on the organisms covered. Particularly well presented chapters are those on ctenophores (Martindale and Henry), nemerteans (Henry and Martindale), echinoderms (Wray), tunicates (Jeffery and Swalla), and fishes (Langeland and Kimmel). After describing patterns of development, these chapters recount experimental analyses in particularly clear and compelling ways. Some chapters are more narrowly focused than their titles suggest: "Annelids" covers mainly the leeches (1 of 3 classes); "Echinoderms," mainly sea urchins (1 of 5 classes); and "Fishes," only the zebra fish, a teleost. Several large or phylogenetically important taxa (including bivalve and cephalopod mollusks, many crustaceans, and hemichordates) are not even considered in the book.

General patterns of development (as well as those within related groups covered in different chapters) are obscured by the lack of cross-referencing among chapters. Summaries for each of the book's sections could have been added to synthesize the comparative information across taxa and to identify gaps in knowledge. Although descriptive and experimental (surgical) approaches to developmental analysis are well covered, there is no full explanation of how genetic analyses of developmental mutants are carried out and why these are so informative when they can be completed. Expanding the introductory section to include definitions of indirect and direct development and generalized descriptions of spermiogenesis, oocyte maturation and cytological organization, and fertilization would also help demystify these subjects for many readers.

The book is especially important because of increased interest in the evolution of, and evolutionary implications of, development. By providing a modern, highly readable compendium of developmental patterns in many different phyla, it should lead new generations of biologists to explore the diversity of developmental mechanisms. Such explorations will uncover many new traits and advance our understanding of developmental transitions, and so provide new perspectives on the evolution of life on Earth.

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