

section is one-third shorter than the previous edition (from 230 to 158 pages). However, there are now three new chapters on auditory perception, two on color perception, and one on olfaction. Surprisingly, in Section VIII, Social Neuroscience and Emotion, there are few if any references to the burgeoning recent literature on social cognition, specifically, socially embedded/situated cognition—e.g., Carlston's *The Oxford Handbook of Social Cognition* (2013. Oxford (United Kingdom): Oxford University Press) or Robbins and Aydede's *The Cambridge Handbook of Situated Cognition* (2009. Cambridge (United Kingdom): Cambridge University Press). In contrast with the fourth edition, there is no longer a section dedicated to higher cognitive functions (e.g., decision-making, reasoning, executive functions). The section in the fourth edition entitled Perspectives (e.g., 20 years of cognitive science research, challenges, and new perspective) has largely been folded into the current edition as Section XI, Neuroscience and Society, with articles on person perception, morality, addiction and mental health dysfunctions, antisocial behavior, and criminal responsibility, among others. The concluding article in this section focuses on research findings, applications, and challenges in the current cognitive neuroscience literature.

The five editions of *The Cognitive Neurosciences* provide a 20-year historical perspective on the empirical, conceptual, and methodological evolution of our discipline. A significant factor in this evolution are edited volumes such as the one under review that periodically document how far we have come—and how far we still have to travel—in modeling the biological and social architectures on which cognitive states supervene. This volume is highly recommended for undergraduate, graduate, and postdoctoral programs and libraries in cognitive psychology, neuropsychology, and cognitive science.

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DEVELOPMENT

LIFE'S BLUEPRINT: THE SCIENCE AND ART OF EMBRYO CREATION.

By Benny Shilo. *New Haven (Connecticut): Yale University Press.* \$35.00. xvi + 174 p.; ill.; index. ISBN: 978-0-300-19663-4. 2014.

Shilo shows us his rich admiration for the embryo and the processes through which the embryo changes into a highly and precisely structured organism. This is not a textbook, as it avoids the usual jargon of science, but it nonetheless conveys the power of scientific explanation and the beauty of nature and our understanding of it. He does this by understanding and taking seriously the point of view of nonspecialist observers.

Through the use of often familiar images and metaphors, Shilo intends to give a picture of how embryonic development works. In presenting a photograph of a symphony concert in Figure 7, for example, he tells us that development is “a concert without a conductor” (p. 17). By invoking our experience of concerts, he lets us imagine how such a complex development of lots of different cells involving many different genes and transcription and regulatory factors can lead to an organized whole. Furthermore, the result is aesthetically attractive. Shilo is a scientist with a humanistic heart.

Instead of following the order of biology textbooks from molecules to man, he looks at processes and patterns that we see changing. What about genes, how does each cell become specialized, how do cells communicate, how do complex patterns emerge, what role does evolution play, what about cell programming and cell death, how do cells work as tissues, what about stem cells, and where are we going next? All of these topics flow logically and also visually along: start with simple and watch the complex emerge.

The “art” in the title refers to his photographs of cells and embryos, and also his photographs of the phenomena to which Shilo compares the biological phenomena. File drawers are like repeated units in muscle contraction, branching roads are like the double embryos that Hans Spemann induced experimentally, umbrellas on a beach are organized like nerve cells, and so on. Some of the juxtapositions are clever and some less effective, but they are fun to consider.

Any reader with an interest in science might enjoy this volume. It is accessible to those who want to understand how development and genetics work. Even for those who may find little new information here, it is nonetheless enjoyable to see

how the author explains fundamental processes and how much he enjoys sharing ideas and teaching others.

As an historian, I have a suggestion. Shilo says that starting with Aristotle onward, “people have believed that embryonic development is determinative and that the final structure of the organism is defined at the outset—even before fertilization” (p. 19). Although Shilo is right that there were preformationists, especially starting in the 18th century, Aristotle himself held a different view, as did the early Catholic church and Jewish traditions. For them, development started without determination, and form arose only gradually through time. Until the 20th century, epigenesis was the dominant interpretation of embryonic development, not preformationism, and epigenesis raised important questions about how form emerges if it is not there at the beginning.

Debates about the relative predetermination or epigenetic development remained heated into the 20th century. More recently, thinking about embryos has gotten tangled with debates about “personhood,” for example, and whether that is established at the moment of “conception.” My historical point does not undercut the value of Shilo’s delightful book, but simply notes that he could have done even more by acknowledging the public and scientific controversy about predetermination and epigenesis.

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CELL AND MOLECULAR BIOLOGY

FUSARIUM: GENOMICS, MOLECULAR AND CELLULAR BIOLOGY.

Edited by Daren W. Brown and Robert H. Proctor. Norfolk (United Kingdom): Caister Academic Press. \$319.00. vii + 182 p. + 2 pl.; ill.; index. ISBN: 978-1-908230-25-6. 2013.

This volume, edited by Daren W. Brown and Robert H. Proctor, with the collaboration of a considerable number of specialists, outlines peculiarity of the fungal genus *Fusarium*, a major plant pathogen that has at the same time a great negative impact on the world economy and a eukaryotic model with great potential for answering many fundamental biological questions. The importance of the genus is based also on its ability to additionally synthesize toxic secondary metabolites, in relation to suitable environmental conditions, which may

lead to the accumulation of mycotoxins in the colonized tissues with a negative impact on humans and domesticated animals, as well as on plants.

The book is a concise and highly updated overview of recent research in the genetics of *Fusarium* in a portable format. The present collection of information allows easy access to the current available knowledge on the genus *Fusarium*, with greater understanding of its genome plasticity and adaptive evolution to a wide range of ecological niches.

All of the chapters finely succeed in capturing the relevance of genus-based findings and act as a springboard for developing new methods to modulate production of secondary metabolites and to control growth and pathogenesis, for the benefit of agriculture as well as of commercial and international trade. Soon, data arising from various next generation sequencing approaches, combined with functional genomic, transcriptomic, metabolomic, and innovative bioinformatic approaches, will increase both experimental and predictive studies. The introductory chapter of the book is a fascinating overview of the genus *Fusarium*. Therefore, readers are provided with in-depth reviews of the *Fusarium* genetics and genomics. Morphogenetic aspects of sexual development are examined, explaining functions of genes that affect development and the impact of ecological niches on genetics and lifestyle. A clear explanation is given for the need of each organism to strike a balance between genome stability and genome flexibility, having an important role in adaptation to diverse environments and challenges.

The global challenge of controlling *Fusarium* species contaminations and related mycotoxin production, aimed to reduce their negative impact on human endeavors, is evaluated through detailed analyses at different molecular levels. Functional categories of genes contributing to virulence are illustrated in details, and correlation between production of specific toxins during infection has been evaluated in an attempt to define pathways and networks of importance to disease formation and/or mycotoxin formation. To date, major proteomic studies associated with mycotoxin production in *Fusarium* species have been summarized, offering an opportunity to expand knowledge of the proteome modifications on regulation of mycotoxin biosynthesis and other processes impacting pathogenicity.

In consideration of nitrogen’s capability to affect the formation of a broad range of secondary metabolites, contributing also to virulence, a well-structured chart is outlined for the genetic nitrogen regulation network and its cross-talk with