lines selectively bred for high and low platelet serotonin levels. Curiously, both groups of rats differ noticeably from their wild-type counterparts only when confronted with an environmental or pharmacological challenge. The book then goes on to describe the interaction between the serotonin system and other neurotransmitters, particularly dopamine, in models of drug reward.

Primates, like humans, have complex social lives yet can be reared under controlled conditions and subjected to behavioral experiments. Simian primates possess a promoter polymorphism similar to humans and also show comparable behavioral traits. Chapters 10 and 11 are a fascinating discussion of the serotonin system in human and primate social behavior. The interaction between genes and the environment emerges as a central theme in neural development with alleles conferring differential sensitivity to adverse life experiences. Importantly, variation in SERT expression could predispose individuals to psychiatric disorders and, more generally, contribute to inter-individual personality differences.

This volume will be of greatest interest to specialists, both basic scientists and clinicians, but the relevance of the serotonin system to various aspects of human behavior may make it a useful reference for curious outsiders. In such complex fields where a great diversity of models and experimental methods are used, a collection of expert reviews should be of great value in making sense of the complicated and sometimes conflicting results.

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Life from an RNA World. By Michael Yarus. Cambridge, MA: Harvard University Press, 2010. 194 pp. US $24.95 Hardcover. ISBN: 978-0674050754.

DNA may get most of the press, but in Life from an RNA World, Michael Yarus wants us to develop an appreciation for RNA. Yarus begins by introducing Darwin’s theory of natural selection while countering some of its more frequent critiques (i.e., the complexity of life cannot be adequately explained by natural selection). Importantly, he emphasizes that any mutation that does not adversely affect an organism’s fitness will not be selected against – this includes both overtly advantageous mutations as well as those that do not change anything. In this way, Yarus effectively lays the necessary groundwork for the relevance of the term “RNA world.”

According to the RNA world hypothesis, RNA, rather than DNA, may be the primordial ancestor of all life due to its abilities to both store genetic information and function enzymatically. Yarus strongly advocates genetics research, explaining how our increased understanding of the genome has reshaped our knowledge of who our closest relatives are (for example, the RNA sequences of humans are more similar to those of butterflies than to those of other insects). Importantly, he provides a rationale for why RNA changes (in addition to DNA changes) should be tracked. Unfortunately, he does not sufficiently explain what RNA is or why it is important biologically until Chapter 9 (entitled “A Thumbnail Sketch of Molecular Biology”). Here, Yarus truly explains the importance of RNA relative to DNA as well as the functions of RNA. He finishes by laying out the necessary properties for the RNA world hypothesis to be correct and then discussing research (including experiments from his own lab) that may help verify these properties.

Yarus writes in an approachable, humorous style, and while the book is a bit disjointed, he makes a good case for the RNA world hypothesis while also getting the reader to think more carefully about evolution and natural selection. The text is very readable and is aimed at individuals who love science and are fairly familiar with the associated terminology. The short chapters are not cluttered with citations, but Yarus does include a list of a few recommended additional readings at the end of each chapter should readers care to delve into a topic more deeply. Additionally, Yarus provides a helpful glossary of terms at the end of the
book to enable those less familiar with nucleic acids or rusty on their molecular biology to catch up quickly.

While each chapter functions well on its own, the book as a whole could have been better organized. As written, it comes off as a series of vignettes on molecular biology rather than a cohesive examination of the RNA world hypothesis. Additionally, while the conversational, humorous, and at times philosophical style of writing is generally engaging, Yarus does overdo it from time to time. The opening quotes for each chapter seem like a forced effort to engage non-scientists and are generally difficult to link with the topic of the chapter. Some chapters seem redundant. Overall, however, Yarus has made a good effort to educate readers on an important but frequently overlooked aspect of genetics and evolutionary biology.

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Tutorial on Neural Systems Modeling.
By Thomas J. Anastasio. Sunderland, MA: Sinauer Associates; 2010. 542 pp. US $76.95 Hardcover. ISBN: 978-0878933396.

Thomas J. Anastasio states in the preface of Tutorial on Neural Systems Modeling that the book is “intended for readers who want to develop an understanding of neural systems modeling, but who lack specialized backgrounds in mathematics, computer programming, or neuroscience.” This textbook does provide an excellent introduction to modeling for students with little or no mathematical or programming background. However, for a student with a computational background, or even one with working MATLAB knowledge, the text can be tedious at times.

Each chapter begins by introducing a topic within neuroscience. For example, the chapter on lateral inhibition begins by introducing general concepts in visual processing before focusing on vision in Limulus, a well-known example of a visual system that utilizes lateral inhibition. These introductions place the neural models to be discussed in the chapter into a biological framework. The chapters then continue on to model the biological system using basic mathematical concepts and MATLAB scripts. But for a student with a working MATLAB knowledge, the line-by-line descriptions of commands and changes to variables are often tedious and take away from the overall point of the modeling exercise. On the other hand, such detailed descriptions would be very useful for a student without MATLAB knowledge.

The models described in the text of each chapter are supported by figures, MATLAB boxes, and math boxes. The figures show both the biological data on which a model is based as well as the MATLAB output expected from the modeling of that data. Each MATLAB box contains the text of the script that generates the neural model discussed in that section. These scripts are also available for download from the book’s companion website. Math boxes explain mathematical concepts presented in the text in more detail. These boxes describe an array of topics, from eigenmode analysis to vector multiplication to solving systems of linear equations. While the Math boxes cannot describe these concepts in full detail, they serve their purpose well; they make the reader aware of the mathematics required to create each model and provide a basis for further study, if the reader chooses.

Each chapter ends with a list of exercises. These exercises require the student to take the models created in the chapter one step farther and evaluate the models for himself. These exercise questions are well-written and address the main points of each chapter. In the end, Tutorial on Neural Systems Modeling makes neural models both accessible and interesting for students of any background. Just be sure to read the text while sitting at a computer with MATLAB running.

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