EVOLUTIONARY DYNAMICS: EXPLORING THE EQUATIONS OF LIFE.

By Martin A Nowak. Belknap Press. Cambridge (Massachusetts): Harvard University Press. $35.00. xiii + 363 p; ill.; index. ISBN: 0-674-02338-2. 2006.

The most remarkable thing about this charmingly written textbook is not its breadth, or its unique perspective on evolutionary biology, but that every chapter is built in part on original contributions that Nowak has made to the subject in less than 20 years. The author has, in that short time, established himself as one of the most original thinkers in evolutionary biology, deftly using mathematical approaches to provide new perspectives and insights into a wide range of biological problems that are of great interest and importance.

This volume serves well as a textbook for an introductory course in mathematical evolutionary biology, but it also has the rare feature of being a delightful read. General readers who want an introduction to the subject will find their time well spent in reading through it in detail; but the modular structure makes it ideal for those already familiar with the essentials of the subject, and who simply want an introduction to unfamiliar topics. This is like no other book that I know, with the closest relatives being the wonderful works of the late John Maynard Smith and (not surprisingly) those of Nowak's mentor, Karl Sigmund (alone and with Josef Hofbauer).

Nowak does not provide a conventional introduction to evolutionary theory, eschewing the details of population genetics in all its complexity; those are topics well covered elsewhere, and the author reserves his efforts for subjects where he can provide a unique and authoritative perspective—game-theoretic approaches to phenotypic evolution, fitness landscapes and replicator dynamics, spatial games, the evolutionary dynamics of cancer and other diseases, and the evolution of language. Somehow, he weaves these disparate topics together into a meaningful and beautiful tapestry. No one who invests time or money in this book will come away disappointed.

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INTEGRATED GENOMICS: A DISCOVERY-BASED LABORATORY COURSE.

By Guy A Caldwell, Shelli N Williams, and Kim A Caldwell. Chichester (United Kingdom) and Hoboken (New Jersey): John Wiley & Sons. $165.00 (hardcover); $65.00 (paper). xx + 225 p; ill.; subject index. ISBN: 0-470-09501-6 (hc); 0-470-09502-4 (pb). 2006.

Most undergraduate science laboratories offer an experience that is akin to attending a second-rate cooking school. "Here are the ingredients," they are told. "These are your tools. Follow the recipe. Add the ingredients. Mix thoroughly. How did it come out?" Often the result is the admonition, "you must have made a mistake." The excitement and creativity of the scientific enterprise is often absent. Moreover, most college teaching laboratory exercises lack continuity. They consist of isolated "experiments" that are not related to each other.

Integrated Genomics: A Discovery-based Laboratory Course aims to remedy this situation. It offers students the opportunity to work on a project in molecular biology with three model organisms: *C. elegans,* baker's yeast, and *E. coli.* Students get the chance to carry out many of the classical procedures of molecular biology (PCR, molecular cloning, DNA sequencing, agarose gel electrophoresis, restriction endonuclease digestion) as well as some that undergraduates are not ordinarily exposed to (two hybrid screens in yeast, RNA-mediated interference in worms). The laboratory exercises are conducted over eight "experiments," each a logical continuation of the previous one. For example, in Experiment 4, students are directed to screen a cDNA library for proteins that interact with a specific worm gene. In Experiment 5, they isolate the cDNA responsible for the production of this protein and sequence it. During Experiment 6, they analyze the sequence and, in the following experiment, insert it into a vector that can generate RNAi. Finally, in Experiment 8, they feed bacteria containing the RNAi to worms and look for effects.

I greatly admire the efforts of the authors. Their goals are praiseworthy and this manual is well written. But readers may meet some obstacles in trying to make use of these efforts. Most small institutions will need to teach the laboratory with a team of faculty: few individual teachers are sufficiently acquainted with the required organisms and techniques to sustain a class where there is any hope of the experiments succeeding. But there is a more serious problem. At the end of this effort, students will still not have engaged in anything resembling real science. All of the genes in *C. elegans* have been sequenced, and their interactions (for the most part) cataloged. There is little prospect of students finding something original. Why not forsake some of these techniques, and work on a project where students study, say, new DNA sequences? There are many organisms whose genes have not been examined. In that way, anything students find will be original. The result will be a real experiment, not a replay of something already known.

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