BOOKS & ARTS

Keeping pace with change

A textbook covering all aspects of evolution puts the spotlight on the molecular motor that drives it.

In batesian mimicry, the warning coloration of poisonous butterflies (top) is copied by harmless species (bottom) to improve their chances of survival.

COURTESY OF N. H. PATEL

Evolution
by Nicholas H. Barton, Derek E. G. Briggs, Jonathan A. Eisen, David B. Goldstein & Nipam H. Patel
Cold Spring Harbor Laboratory Press: 2007. 833 pp. $100, £39.99

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As a young man I attended an evening party at the Cold Spring Harbor Laboratory in New York. Max Delbrück approached me and asked what I was interested in. Awed by the unexpected attention from so famous a scientist, I stammered something about genetic variation in natural populations and how, through time, this becomes transformed into morphological and other differences between species. As I began my second sentence, he interrupted to say, "Young man, you are wasting your time," and abruptly walked away. I brooded on this for a while — quite a while.

What Delbrück did not foresee (and nor did I) was that during the next 30 years molecular and cellular biology would flourish, and that in one of the great scientific revolutions in history these fields would spin off a succession of powerful new experimental techniques augmented by automation and computational power. Evolutionary biology prospered from these advances, and the field as I knew it then was a mere preamble to what it is today. Every branch of evolutionary study has been transformed and invigorated, and some branches have been created anew — for example, 'evo-devo' (the evolution of developmental mechanisms).

Textbooks in evolutionary biology have generally kept pace with these changes and several excellent books are available. This new one by Barton and colleagues is among the best. The production quality is superb in layout, composition, typesetting, colour palette, illustrations and gorgeous half-tones; and the writing is excellent, as one might expect from such a stellar cast of experts in population genetics, palaeontology, human genetics, bacterial genomics and developmental biology (respectively).

The book is in four parts. The first is a history of evolutionary thinking and evidence for the evolutionary process, which clarifies common misconceptions about evolution and rebuts 'intelligent design'. The latter is unfortunately necessary in the United States, where people who think that space aliens have landed on Earth outnumber those who believe in the darwinian theory of human evolution by about 3:1.

Part I also includes an excellent introduction to molecular biology, although I suspect that much of this duplicates what most students already know. Part II, on the origin and diversification of life, is up to date with discussions on the last universal common ancestor, as well as being an outstanding introduction to evo-devo. Part III comprises about half the book and deals with the genetic mechanisms of evolution, including speciation, in a treatment that is fresh, thorough and professional. Subtle concepts, including Fisher's geometrical theory of adaptation and the coalescent, are clearly described with minimal mathematics. The final section is devoted to human diversity and evolution, and includes an engaging discussion of human nature.

This book may not fit every instructor's needs. Some may prefer a different balance of origin, diversity, molecular evolution, population genetics and human evolution, or they may need a textbook written at a different level. But every instructor should examine this book and make an individual decision.

The absence of end-of-chapter problems is a surprise. They are to be posted on the web soon, apparently. The web feature eliminates a lot of chapter-end clutter, but it will work only if students are motivated enough to access the problem sets and extra material online. Students who learn only the facts, but not how to use them or integrate them, will surely be wasting their time, no matter what their interests. ■

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