ecological connections: how nature coexists with—and even, in some cases, thrives with—human development. The constant cost/benefit equation of each species' fight for survival appears repeatedly. Fascinating observations come forward. For example, songbirds (not surprisingly) do not like to nest near the nest of a Cooper's hawk (a choice observed to result in 7% higher mortality), but nesting success decreases as well if the birds nest too far away from the hawk—in this case, losing the hawk's “protective shield” against other predators such as jays and squirrels. One of Marzluff's students who studied bird populations of industrial sites found, to his surprise, that “one-third of the business sites equaled or exceeded the diversity [he] observed in the richest forest reserve.” It is a mixed story of fascinating complexity: presentation of intentional stewardship at industrial sites can enhance diversity and species survival, but the clearing of native lands for managed land use such as golf courses can lead to local extinction. Of particular interest to biologists and biology teachers, this book describes the design and results of many graduate-student studies that have explored the human-wildlife interface, examining behavior, song, distribution, DNA, and many other markers of survival and change in suburban species. He presents, as well, a thoughtful list of how humans can be “good neighbors” to their wildlife (did you know that more gas is spilled annually filling up lawnmowers than was released in the Exxon Valdez disaster?). Subirdia suffers occasionally by being a bit repetitive, and, from a science point of view, study data could have been enhanced through graphic presentation. But these are fairly minor points in an otherwise rich and rewarding read.

Each one of these texts would be a valuable addition to the libraries of both birders and biologists. Practically each page reveals fascinating information about the birds themselves, but also how we study them. Students could use these texts to study individual species, examine diverse ecology, and learn how scientists think and work. Finally, given that “today it is impossible to think of animals without concern for man's impact on them,” each of these texts further the reader's understanding of humans' effects on ecosystems and species. Penguins, Hummingbirds, and Subirdia make a diverse, and very rewarding, threesome.

Penguins
Hummingbirds
Welcome to Subirdia
Cate Hibbitt
Lincoln School
Providence, RI 02809
chibbit@lincs.k12.ri.us


The Course of Nature is an illustrated primer on the science of genetics and evolution. It was written to accompany The Origin of Species in a college colloquium. On its own, The Course of Nature concisely introduces the reader to the concepts of DNA, mutation, protein synthesis, and the role of genetics in natural selection. The illustrations complement the text and, in some cases, provide additional material for discussion. Used in an AP Biology class, The Course of Nature makes an excellent supplement to the traditional text. With some scaffolding or by employing close-reading strategies, The Course of Nature can be used in an introductory biology class as well.

The book is relatively short, and each page of text is partnered with an illustration. The chapters take the reader through the basics of molecular genetics. Chapter 1 is a brief overview of the creation of the universe. The author uses the metaphor of molecules of water in the oceans to describe the smallness of atoms. In this way, he sets the stage for describing the interaction of molecules that result in proteins. Chapter 2 continues the journey in deep time with a description of the evolution of early life.

Chapter 3 is a lovely sojourn through the structure of DNA. It is such a clear and concise description of base-pairing, the sugar–phosphate backbone, and Watson and Crick’s discovery of its helical shape, that I might scrap lecturing on this information forever, in place of a class discussion of the text. The illustrations on pages 34 and 38 are especially effective at conveying these ideas in a playful way.

While some of the concepts in this book will seem oversimplified to those who study or teach biology, The Course of Nature is ideal for the student or adult who wants to learn the basic tenants of molecular biology and how it interplaes with natural selection and evolution.

Robin E. Bulleri
Carrboro High School
Carrboro, NC 27510
rbulleri@chccs.k12.nc.us


Weird Birds and Weird Frogs by Chris Earley are a delightful introduction to some weird and wild avian and amphibian creatures. Weird Birds features beautiful full-color photographs of 59 birds, including the very serious Eurasian Eagle-Owl and the regal Resplendent Quetzal. Weird Frogs includes an intimate look at 58 amphibians like the exotic Vietnamese Mossy Frog and the familiar Common Spadefoot Toad.

Each photograph is accompanied by a paragraph or two describing the habitat, life cycle, or interesting facts about each bird or frog. The books are written for ages 10 and up, but my three- and six-year-olds were so captivated with the pictures that we read the text together, and learned lots of new words as a result. One of my favorites was Darwin’s Frog, who swallows up the fertilized eggs...
and stores them in his vocal sac. The embryos develop into tadpoles within the eggs, then hatch as froglets and crawl out of dad’s mouth. Nature continues to surprise me.

Weird Birds and Weird Frogs would be ideal additions to any elementary or middle school library. They eye-popping photographs are enough to catch the attention of any curious book-hoeker. The written descriptions are a great way to help your youngster build his or her science vocabulary and appreciation for the beautiful, and weird, creatures found in nature.

Rohin E. Bulleri  
Carboro High School  
Carboro, NC 27510  
rbulleri@chcs.k12.nc.us

**EVOLUTION OF CELLS**


This book provides a detailed account of what is known about how cells evolved and developed, and where the focus is directed within ongoing research. Throughout the book, Harold explores the various lines of evidence that make up aspects of cell history. However, he makes it clear that the origin of cells and the path of cellular evolution is not a straightforward story, and many aspects of this research lack a consensus among scientists. To that point, Harold says, “The realm of cell evolution is murky, and as yet thinly charted, if you go there, anticipate things never before seen, and pack a head-light that casts a wide beam” (p. 103).

The book begins with an exploration of cells, genes, and evolution and sets up a continuing theme throughout the book that “the evolution of cells took place so long ago that all but the faintest traces of it came about have been erased” (p. 16). Harold explores the role of genes within cells and within cell evolution. He then turns the focus, in chapter 2, to the “tree of life” and the idea that not all evidence or researchers agree with the common textbook depiction of it. He cautions that “the metaphor of the tree of life still ‘largely speaks the truth,’ but must not be taken literally” (p. 33). Harold takes time to explore the world of microbes (chapter 3) and the common ancestry of all living things with particular focus on eukaryotic organization (chapter 4). Within a discussion on the bioenergetics of cells (chapter 5), Harold reminds the reader that “at no stage can life have existed without access to a source of energy and the means to harness the energy to the purposes of life” (p. 68). Prokaryotic and eukaryotic cells each have a chapter to themselves (chapters 6 and 7, respectively), and Harold points out that “Compared to prokaryotes, eukaryotic cells represent not only an alternative mode of cellular organization but one endowed with far richer evolutionary potential” (p. 104). Chapter 8 is focused on symbiosis and on the acquisition of mitochondria and plastids into evolving eukaryotic cells. Harold describes this episode as of “surpassing importance” since these symbionts “supplied the evolving eukaryotic cells with abundant energy and enabled the emergence of complex organization and all the wonderful world of higher organisms” (p. 127).

The last four chapters represent a shift in the focus of the book, as Harold explores evidence of cellular life in fossils (chapter 9), more general, overarching themes of the very beginning of cellular life (chapter 10), and how early cellular evolution differs from the process as we now know it (chapter 11). He says, “Genes can only function in the context of cells, and evolution before there were proper cells must have been very different from the process we know” (p. 192). The final chapter is a summary of where the questions regarding the history of cells currently stand and where the author sees them going in the future. This chapter turns much more philosophical and succinctly summarizes the state of a large body of research. Harold’s own voice speaks most clearly in this chapter, and his fascination with the topic is clear when, for example, he says, “For magnitude, duration, and sheer awesomeness, few tales match the history of life” (p. 224).

Overall, I found this book to be highly informative. Harold provides a careful explanation of the competing issues that exist in the field and why we may never have a definite answer, particularly about the earliest cells and how they originated. Harold warns in the preface that he assumes that readers will have a basic understanding of both cellular and molecular biology. I found a basic understanding to be generally sufficient; however, at times, Harold explained processes as if the reader had no knowledge but then used terminology that was beyond basic. Certainly, upper-undergraduate biologists would find most of the topics accessible. At times the book is quite dense, but effective explanatory figures and a thorough glossary help clarify the text. The book perhaps raises more questions than it answers, but it highlights the uncertainty that still remains and the work that has gone into investigating the issues. I would recommend its inclusion as a text for upper-undergraduate or graduate courses on cells and, particularly, on cellular evolution.

Jaime Sabel  
University of Nebraska-Lincoln  
Lincoln, NE 68503  
jaime.sabel@nebraska.edu

Elizabeth Cowles teaches freshman-level biology, biochemistry, and entomology at Eastern Connecticut State University. She has taught at the undergraduate and graduate college levels for over 20 years. Her interests include insect toxicology, protein characterization, and astrobiology. Cowles holds degrees in biology and biochemistry from Cornell University and Michigan State University. Her address is Department of Biology, ECSU, 83 Windham St., Willimantic, CT 06226; e-mail: cowles@easternct.edu.