ance on the implementation of the often complex models of DNA evolution in a maximum likelihood setting. For readers facing tasks that even PAUP* can't handle, such as maximum likelihood analyses of amino acid sequences, the author briefly discusses Puzzle (*3*) and mentions (but does not discuss) the PHYLIP package (*4*) for other eventualities. Hall also discusses MrBayes (*5*), which uses Bayesian methodology to evaluate trees and to reconstruct ancestral DNA sequences. The program, which is quite fast and can handle very large phylogenies, also provides a means of estimating how much confidence one can have in different branches of the tree.

Many of the tree calculations discussed in the book are very computer-intensive and can take over one's computer for days. Before hitting the "execute" button, a researcher must recognize the magnitude of the task at hand and warn labmates accordingly.

Typically, one picks up a how-to manual to fix something, perhaps in a car, a house, or a computer program. One often turns directly to the section covering a particular task, such as how to adjust a carburetor. Although Hall's book can be used like this, its easy-to-follow structure and numerous diagrams invite the reader to simply peruse it from start to finish. *Phylogenetic Trees Made Easy* will become an invaluable source for students and researchers in a wide range of biological disciplines.

References and Notes

1. J. D. Thompson *et al.*, *Nucleic Acids Res.* **25**, 4876 (1997). ClustalX is available from http://inn-prot.weizmann.ac.il/software/ClustalX.html.
2. D. L. Swofford, *PAUP*: Phylogenetic Analysis Using Parsimony and Other Methods* (Sinauer Associates, Sunderland, MA, 2000).
3. Puzzle is available at www.tree-puzzle.de.
4. The source code, some executable files, and documentation for the PHYLogeny Inference Package are available at http://evolution.genetics.washington.edu/phylip.html.
5. Developed by J. P. Hulsenbeck and Fredrik Ronquist, MrBayes: Bayesian Inference of Phylogeny is available at http://morphbank.ebc.uu.se/mrbayes.

NOTA BENE: OCEANS

Why Did the Penguins Gasp?

The Blue Planet
A Natural History of the Oceans
by Andrew Byatt, Alastair Fothergill, and Martha Holmes

BBC One, Fall, 2001. Discovery Channel, January, 2002. Eight 50-minute episodes.

BBC Worldwide, London, 2001. 384 pp. £24.99. ISBN 0-563-38498-0. DK, New York, 2002. $40. ISBN 0-7894-8265-7.

Breathtaking. Take a lungful of air and plunge in. *The Blue Planet* comprises a series of eight television films produced by the British Broadcasting Company's Natural History Unit. Each episode is paired with a short *Making Waves* epilogue that looks at the making of the films. The films are also accompanied by a large format, extensively illustrated book, which could grace coffee tables and perhaps classroom shelves. The films and book alike are stuffed with fantastic, mind-boggling images, and the technical virtuosity of the filmmaking is obvious.

Each program is devoted to a different sector of Earth's oceans: the open waters, the abyssal depths, coasts, seasonal seas, frozen seas, tropical seas, and tidal zones. The information that can be absorbed from an ambitious survey of this kind is limited, but we can still marvel. Nevertheless, the limitations of trying to comprehensibly sample each zone do become obvious. For several minutes of the open ocean episode, the mountains of Baja California are visible on the horizon, and each film includes a similar sequence of a shoal of small fry being gobbled up by ravenous predators of various magnitude and ferocity. The sound track is always tasteful and unobtrusive, but sometimes confusing. Ctenophores and jellyfish cannot possibly make audible noises, yet we seem to hear them. But unless you know that parrot fish really are noisy eaters, you might be deluded into thinking sounds accompanying footage of them scraping algae off a coral reef are simply more amusing "radiophonics."

Yet there are plenty of revelations. Despite knowing that life can thrive in the most extreme environments, it is still a shock to see some of them. For instance, the remarkable cold seeps in the Gulf of Mexico are so saline that submersibles bounce on their surfaces. Their shorelines hum with bizarre life, but tantalizingly, we learn nothing about what is within the seeps. We do learn, however, in graphic, gruesome detail what happens to a gray whale calf assaulted by orcas. Their attack is apparently just for fun, and the corpse sinks unconsumed until discovered by large numbers of revolting hagfish. We are also shown amazing views of emperor penguins rocketing underwater, generating trails of bubbles, and shooting out of the deep to break through the surface and bounce onto the ice. If they were lucky, they escaped the leopard seal and were only captured on film. Spectator penguins stand close-packed on the ice floe: watching their companions leap ashore, gasping in unison when the leopard seal attacks, swaying together like a football crowd.

One shortcoming of the films is the limited attention paid to small organisms. Although we see something of copepods and ctenophores and we learn about the chemical and light trails formed in the water by planktonic organisms, there is little about bacteria and algae. When they are featured, the small fry tend to be a foil for bigger, celebrity animals: sailfish after sardines; sharks after anchovies; yellowfin tuna, dolphins, and fin whales cavorting and streaking around the shoals of herring and mackerel attracted to plankton blooms. And even the majestic sunfish presenting its flanks to passing gulls so they could peck off the parasites.

Listening in the dark. Hairy anglers are covered with long antennae that are senstive to minute movements in the water.

CREDIT: DAVID SHALE/BBC *THE BLUE PLANET*

Although plenty of facts are presented, our understanding of many aspects of these largely unknown and unexplored environments is based on little more than wild guesses. There are many more questions to ask than the established facts can answer. By the end of the series, we have marveled a lot but not actually learned much.

It is easy to criticize television natural history as superficial. Doing so is a little unfair because such programs are supposed to be entertainment and making such films requires courage and patience. Nevertheless, there is a deeper problem. Although we armchair naturalists may have become intimate with certain aspects of the sex lives of lions and the home economics of mole rats, few of us will ever see these animals in the flesh. Wildlife and pristine environments are becoming increasingly dispensable to humankind—not least because wild animals and places will be forever extant in virtual environments, so why should we care about their continued real existence? What is worse, by concentrating on a very few large and glamorous species, armchair naturalists fail to gain a sense of the real diversity and interdependence of life on Earth.

—CAROLINE ASH AND SAMUEL ASH CROFT