

Teeming boisterous life

Sensuous Seas: Tales of a Marine Biologist

by Eugene H. Kaplan

Princeton University Press: 2006. 288 pp.
\$24.95, £15.95

Jon Copley

"What good men most biologists are, the tenors of the scientific world — temperamental, moody, lecherous, loud-laughing, and healthy," wrote John Steinbeck in *The Log from the Sea of Cortez* (Viking, 1951). "The true biologist deals with life, with teeming boisterous life, and learns something from it, learns that the first rule of life is living."

Steinbeck wrote those words on an expedition with his marine-biologist friend Ed Ricketts, but the description also seems to fit Eugene Kaplan, the author of *Sensuous Seas*. Kaplan's book is a compilation of entertaining anecdotes from a career that includes building fish farms in Africa, teaching science in Israel and establishing the Hofstra University Marine Laboratory in Jamaica. The book celebrates the joy of knowledge for its own sake, but also demonstrates some of the interactions between marine biology, everyday lives and even history.

Take the Mediterranean rock snail *Hexaplex trunculus*, which provided the purple dye used by royalty in the classical world. Exploiting the commercial opportunities of this snail's secretions made Phoenicia, now Lebanon, a major trading power. The same snail may also have been the 'hillazon' animal described in the Torah and the Talmud as the source of the dye used in Jewish prayer shawls. Kaplan also suggests that the fish used to feed the five thousand in the Bible would have been tilapia (pictured), whose hardiness holds promise for tackling famine through aquaculture today.

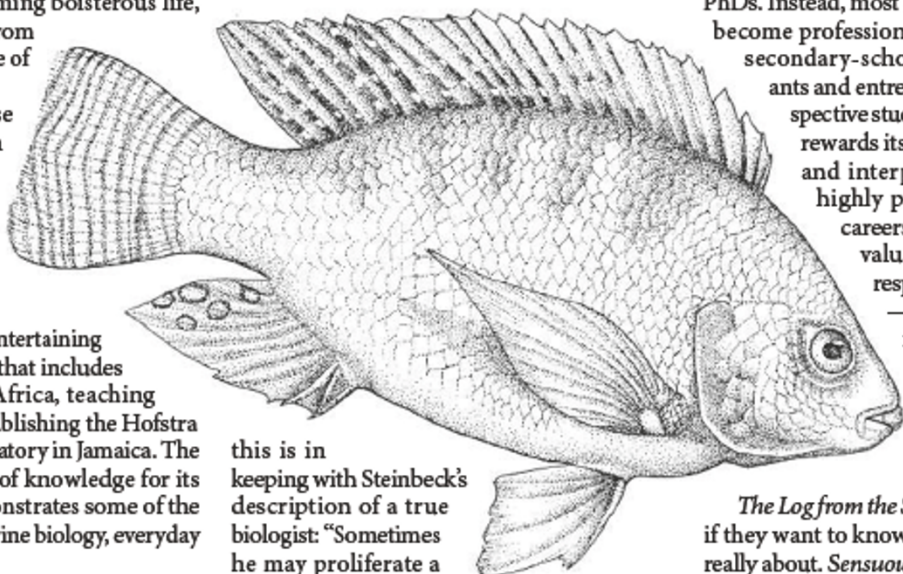
Kaplan has been teaching marine biology for half a century, and shares his experience of bringing the subject alive. Students are inspired by passion and there is plenty here, both for the subject and of the more earthy kind. Kaplan discusses with aplomb the pheromones of lamprays, the reckless mating of one-eyed shrimp, and the broken-off reproductive organs of male squid. One might conclude that he is rather preoccupied with matters reproductive, but that is true of most biologists.

There are horrors lurking here too, such as the candiru — a fish that can wriggle up the urethra of its unfortunate victim to lodge in the bladder and feast on the blood. Other perils mentioned in the book include the poisons of the pufferfish, the cone shell and the innocuous-looking fruit of the manchineel tree —

known with good reason as the 'death apple'.

This compendium of sex and death provides plenty for raconteurs wanting to leave a lasting impression on friends, relatives or — in Kaplan's case — students.

Each of the 31 chapters opens with either one of Kaplan's own memoirs or a scenario from his imagination, before exploring the marine biology behind the tale. As a result, a reader may sometimes wonder where the book is going, although the entertainment seldom flags. But



this is in keeping with Steinbeck's description of a true biologist: "Sometimes he may proliferate a little too much in all directions... meanwhile he is very good company, and at least he does not confuse a low hormone productivity with moral ethics."

Kaplan believes in hands-on teaching and advocates the necessity of literally immersing marine-biology students in their subject. Drawing on several decades of teaching field courses in the Caribbean, he describes making his students wallow in mud, chase specimens

and learn invertebrate anatomy by preparing a paella. This is not educational sadism, as students are powerfully motivated by exposing all their senses to Steinbeck's "teeming boisterous life". Watching my own students scramble across rocky shores and peer tremulously under seaweed, I can only agree that these activities ignite interest and trigger understanding.

People sometimes ask me whether the world really needs more marine-biology graduates. Despite the vast challenge of exploring and understanding the marine realm, very few students actually become career scientists, as openings are highly competitive now that universities are turning out more and more PhDs. Instead, most marine-biology students become professionals in other areas, from secondary-school teachers to accountants and entrepreneurs. I reassure prospective students that marine biology rewards its devotees with analytical and interpersonal skills that are highly prized in a multitude of careers. It also instils culturally valuable understanding and respect for the natural world — and why not have some fun along the way?

Kaplan's book conveys the breadth and excitement of an education in marine biology. I recommend *The Log from the Sea of Cortez* to my tutees if they want to know what marine biology is really about. *Sensuous Seas* is now next on the list — and there is no stronger recommendation that I could make.

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MORE ON THE SEA

Underwater to Get Out of the Rain: A Love Affair with the Sea

by Trevor Norton (Arrow, £6.99)

Astronomy through the years

The Cosmic Century: A History of Astrophysics and Cosmology

by Malcolm Longair

Cambridge University Press: 2006. 565 pp.
£35, \$60

Jay M. Pasachoff

John F. Kennedy once addressed what he called the "most extraordinary collection of talent, of human knowledge, that has ever been gathered at the White House, with the possible exception of when Thomas Jefferson dined alone". After diving into Malcolm Longair's epochal *The Cosmic Century*, a history of astronomy and astrophysics, he is the one I would want to dine

with if I wanted to learn about an unlimited range of material.

Longair's book is a complete reworking and major extension of a chapter he once wrote for a history book of twentieth-century physics. This background perhaps explains how such a knowledgeable astronomer was inveigled into spending the time needed to gain such a broad view. It's no surprise that the author of *Alice and the Space Telescope* (Johns Hopkins University Press, 1989) can write clearly and invitingly, but I had to sample deeply to verify that he did not give short shrift to such wide-ranging topics as the discovery of exoplanets, the use of helioseismology to analyse the inside of the Sun, and

advances in supernova research brought about by observations of SN 1987A.

Different readers may want different treatment of the subjects, depending on their mathematical backgrounds. Longair's discussion of Einstein's general theory of relativity, for example, provides sets of equations that may scare off non-physicists. But most of his treatments are non-mathematical, and many are humanized with quotations. For example, Longair not only points out that Jocelyn Bell first recognized the signals we now know as pulsars, but describes how he was present when the Soviet astrophysicist Iosif Shklovsky told her, "Miss Bell, you have made the greatest astronomical discovery of the twentieth century" (at least as far as 1970, when the encounter took place). Those familiar with the history of the discussion over credit for the discovery may note that he gives Antony Hewish, Bell's supervisor who shared the 1974 Nobel prize for physics for his work on pulsars, an acknowledgement for reading the chapter from which this book sprang.

Longair also tells the story of an underground seminar (literally, given its location in the basement of the Leiden Observatory in the Netherlands) in 1944, at which Jan Oort asked a young H. C. van der Hust to calculate whether any spectral lines would be detectable in the radio part of the spectrum. Longair's discussion describes the result (a spectral line at 21 cm) and explains how it was used to map the quasi-spiral arms of the Milky Way. He then describes the subsequent detection of 125 different molecules in the interstellar matter, and explains how the unexpected relationships of their abundances led researchers to deduce how the molecules were formed.

The section on exoplanets — unfortunately only a subsection of the chapter on the interstellar medium — explains the importance of high-precision spectroscopy, and starts with the pulsar planets discovered by Aleksander Wolszczan and Dale Frail. Longair then discusses the first optical detections of exoplanets by Michel Mayor and Didier Queloz, and a chapter endnote directs readers to *The Extrasolar Planets Encyclopaedia* if they want to keep up-to-date. I think it would have been fair to also mention the extensive work in the field by Geoff Marcy and Paul Butler, and their encyclopaedic website at www.exoplanets.org.

Little of astrophysics and cosmology escapes the gaze of Longair, a former astronomer royal for Scotland who now heads the Cavendish Laboratory in Cambridge, UK. Readers, especially those already familiar with many of the topics, will enjoy his prose. Certainly all graduate students in the field should read this book. And anyone interested in the history of science would enjoy it as bedside reading if they were willing to skip the equations. ■

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Failing the ailing

Bad Medicine: Doctors Doing Harm Since Hippocrates

by David Wootton

Oxford University Press: 2006. 320 pp. £16.99, \$25

Andrew Scull

David Wootton has made a truly remarkable discovery that he can't wait to share with the rest of us: medicine didn't work very well for millennia. Indeed, it almost certainly didn't work at all. For most of recorded history, it seems, doctors secretly did little except harm their patients while pretending to cure them. "Before 1865 all medicine was bad medicine," he writes in his book, appropriately called *Bad Medicine*. But then came Joseph Lister and antiseptics, Louis Pasteur and germ theory, and Alexander Fleming (or was it Howard Florey?) and penicillin. And from that point on, science was in place, medicine worked, and we entered an era of continuing progress and enlightenment.

Unfortunately, Wootton laments, benighted medical historians have somehow overlooked this state of affairs. Instead they have either constructed narratives of progress when medicine wasn't progressing, or (in a perverse reversal extending over three decades now) have decided that it's wrong to write tales of heroes and villains that describe an on-wards-and-upwards march to scientific nirvana.

The sources of this historiographic perversity are never clearly articulated, nor are many of the offending historians identified by name, for Wootton's is a blanket condemnation. He alone has been privileged to see the true state of affairs, and henceforth the history of disease and its treatment will have to be radically recast

in the light of his fundamental new insight. For the notion that there is any sort of continuity in the medical enterprise is fundamentally mistaken, he declares: we need to develop a history of error, albeit often honest error, followed by a new history of triumph. This latter alone constitutes "the modern history of medicine, grounded in constantly developing scientific understanding".

A small fraction of the book is devoted to medicine's successes: Lister's development of antiseptic surgery, John Snow's work on cholera in the mid-nineteenth century, and the advent of antibiotics, especially penicillin. For the most part, however, Wootton's eye falls on medicine's failures and missteps. For two thousand years, the galenic and hippocratic approaches dominated Western medicine. The remedies they proffered, Wootton reminds us, were painful and actively harmful, except to the degree that they produced placebo effects. Of course, there were developments in the understanding of human biology and in medical technology in these years: Andreas Vesalius produced his stunning work on human anatomy; William Harvey discovered the circulation of the blood; Antonie van Leeuwenhoek and others used microscopes to reveal the world of the infinitely small; René Laennec invented the stethoscope; and François Magendie, Claude Bernard and others used unspeakably cruel vivisections to explore the physiology of the body. But none of these developments led to therapeutic progress, and those that might have done so (such as the ability to see germs) went unexploited for decades, even centuries.

The brief sketches Wootton provides of these and other episodes in the long reign of error are rendered deftly and vividly. When he



A saw point? Some medical practices may have done more harm than good.