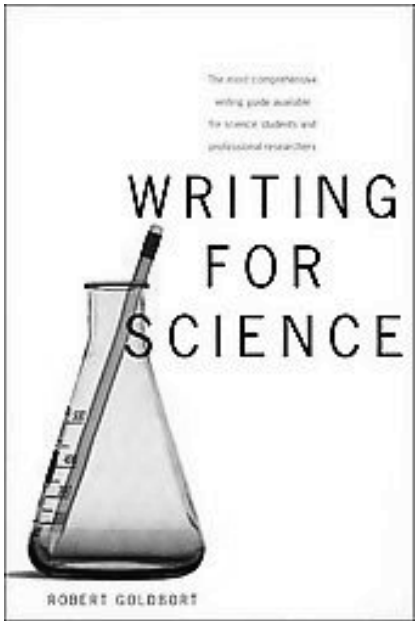

WRITING FOR SCIENCE. ROBERT GOLDBORT. NEW HAVEN: YALE UNIVERSITY PRESS; 2006. XIV + 330 PAGES. HARDCOVER $50.00, SOFTCOVER $20.00. ISBN-13: 978-0-300-11551-2 (HARDCOVER), 978-0-300-11793-6 (SOFTCOVER).

It is well recognized that the increasing pace of scientific discovery has been matched by increasingly serious problems in effective scientific communication. Regardless of how well a study is designed or how exciting its results are, poor reporting of findings can lead to three things: the findings may not be appreciated for what they are, other researchers may not be able to make appropriate use of the findings, or the findings may not get published at all. However, as author Robert Goldbort notes on page 1 of his book, "scientific English . . . is a communication tool, a culture of writing, and a plain and readable manner of writing with specific compositional strategies and uses of language—all of which permit the community of scientific researchers to conduct its professional affairs." The task that Goldbort, an associate professor of English at Indiana State University, therefore sets for himself in this book is, as the title implies, describing how to write for science. It's a book that is needed and timely—some might even say a little too late, given the epidemic of bad scientific writing raging right now.

Recognizing that learning how to write well in science, like any skill, is best accomplished early in one's career, Goldbort devotes several chapters to topics pertinent primarily to the novice scientist. For example, there are chapters on recording laboratory notes, writing undergraduate reports in the sciences, and preparing scientific dissertations and theses. More experienced researchers shouldn't necessarily skip these chapters; they may find some useful information for their novice researcher colleagues and for their students, if not for themselves. Also not to be missed in some of these chapters are important points about writing in science that are applicable to all forms of writing. Goldbort makes it quite clear that the IMRAD (Introduction, Methods and Materials, Results, and Discussion) format is applicable to virtually any form of scientific writing, whether laboratory notes and undergraduate reports in the sciences or the standard research article, with which the format is most associated. The obvious message is that a good grounding in the IMRAD approach to the organization of material starting both early in one's study and early in one's career in science will not only make the final reports of research findings easier to prepare but ensure that the reports are complete, cohesive, and clear.

My favorite chapter is Chapter 1, titled simply "Scientific English". Good scientific writing starts with a good understanding of the style of writing appropriate to scientific description, including its history. As Goldbort explains, "the primary purpose of this chapter is to delineate and illustrate the unique linguistic values that the scientific community places on the way it uses words for conducting its activities and achieving its goals." Probably recognizing that those who have been around the language of science for a long time may not see that the simplicity, directness, and precision that are the hallmarks of effective scientific writing didn't just spring into existence full-blown, Goldbort starts the chapter with a history lesson. He traces the roots of scientific description to Francis Bacon, making him, in effect, not just the father of modern science but the father of modern scientific writing. As Goldbort describes Bacon's views about writing, "whereas the traditional linguistic style reveled in subjective ambiguity, the new one [Bacon's] was to be utterly and objectively plain in the service of true learning." In a section in the chapter titled "The Human Dimension of Scientific English", Goldbort looks at why the language of science should not be anything but plain and direct. Very simply, as he explains, it is because "scientific English is expected to transfer information without interfering with clarity, readability, and utility." However, that doesn't mean that scientific description should be devoid of a human presence. In fact, Goldbort believes this presence is vital. To help illustrate the point, he examines the creation of new words in science that rely on the human experience. A perfect example can be found in the terminology used to describe the various functions of DNA: *messaging, coding, transmitting, tran-*

scribing, translating—all terms that have made their way into the scientific lexicon and that were inspired by human experience. Next, in a section called "Scientific English in Action", Goldbort delves into the more practical aspects of scientific writing that achieve the requisite simplicity and clarity. The author's intent here is "to serve two interrelated purposes: first, to illustrate some basic principles of usage in scientific English, and second, to provide practical guidance in making choices that favor maximum plainness in scientific prose". New researcher-writers will find it instructional; more experienced ones should find it a good refresher. Topics, with examples, include passive and active voice, pronoun references, verb tense, concrete versus abstract wording, and denotation versus connotation. Long sections are also devoted to discussions of clarity and coherence, simplicity and conciseness, and misused words and phrases, with a final section on punctuation, an often-neglected topic in scientific writing.

Not surprisingly, Goldbort devotes long chapters to the writing of research articles and grant proposals. Although I didn't find much that was particularly new in his description of each, I wouldn't want or expect to. Much has been written about each, and a degree of uniformity is to be desired. Nonetheless, readers may find his perspective additionally helpful in mastering the techniques of preparing and writing these two Goliaths of scientific communication.

Topics that generally get scant attention, if any, in most books on scientific writing are figures, tables, and references. These are covered in chapters titled "Scientific Visuals" and "The Documentation of Scientific Resources". Although it seems as though not much more can be said about references than is covered in this book, the chapter on scientific visuals (tables and figures) is brief. Goldbort focuses on important overall considerations in the preparation of visuals, including their role in unencumbering and clarifying written description.

Two final chapters that readers should find valuable are "Workplace Scientific Writing: Letters, Memoranda, and Abstracts" and "Scientific Presentations". Scientists, perhaps more than people in such other professions as business and law, may give less thought to everyday communications such as job-application letters, correspondence, technical memoranda, and even reprint requests, but each has its place in scientific communication, and Goldbort takes a thorough look at each. Abstracts, whether for meetings or of research articles, also tend to get overlooked as important communication tools, and Goldbort spends several pages talking about the types, the content, the organization, and the importance of these research articles in microcosm. The chapter on scientific presentations alone is worth the price of the book. Anyone preparing for his or her first presentation should read this chapter. Goldbort covers not just the written preparation but guidelines for visuals and techniques for making presentations to large groups of researchers.

Who should read this book? The novice scientist writer certainly. More experienced scientist-writers as well, both as a refresher in good writing and as a resource for teaching novice researchers how to write. Scientific editors and writers will also benefit from the perspective the book gives on the scientist as a writer.

Beth Notzon

BETH NOTZON is a scientific publications manager at the University of Texas M D Anderson Cancer Center.