

Preface

As a biologist who also teaches composition, I see many biology students who, although they have strong backgrounds in biology, have trouble understanding the writing tasks and challenges unique to their discipline. Biologists need to think creatively about science, and they need to write about science clearly, accurately, and concisely. In fact, these two processes, thinking and writing, are as interdependent in science as they are in any other field. Unfortunately it is difficult to fit any extensive discussion of scientific writing into a regular semester-long biology course. I hope this book can substitute for such discussion, serving as a supplemental text for courses requiring laboratory reports or longer written assignments. Although intended primarily for undergraduates who need an introduction to the aims and format of biological writing, it will also be useful for more experienced students, including master's and doctoral candidates who are preparing dissertations or manuscripts for publication. Finally, I hope this book will also find its place in the small but growing number of courses on scientific writing at the undergraduate or graduate level.

Like its two predecessors, this edition is organized as a self-help manual, offering straightforward solutions to common problems and numerous examples of both faulty and effective writing. All of the book's most important features—rules highlighted with bullets, numerous examples, clear and concise explanations, and a detailed index—have been retained, including the spiral binding for easier use. The third edition includes expanded discussions of many topics as well as much new material. The Introduction discusses the role of both formal and informal writing in biology and gives an overview of the diversity of writing tasks faced by professional biologists. Chapter 1, a detailed guide to locating and using biological literature, has been thoroughly revised to address the ever-changing parameters of electronic research. Coverage includes guidelines for conducting online searches, updated descriptions of a wide variety of scientific databases, and tips on evaluating Internet sources. Sections on how to read scientific papers, how to take good notes, and how to avoid plagiarism—always of concern to students—have been retained.

Chapters 2 and 3 provide an introduction to the tasks of gathering, analyzing, and presenting data. New to Chapter 2 is a discussion of how to use spreadsheets in recording data. Chapter 3 now includes updated examples of figures and tables. Both chapters still include advice on experimental design and the use of statistics both in writing and in research.

Chapters 4 and 5 discuss the two types of written assignments most commonly faced by biology students. Chapter 4 focuses on the *research paper*, the primary form in which professional biologists communicate original findings. Students are expected to follow this model when they prepare research projects or laboratory and field reports. Chapter 5 discusses the *review paper*, which resembles the library-oriented "term paper" assignments of advanced courses. Both chapters include many examples, as well as an annotated sample paper—a new one in Chapter 4.

Students often get confused about how to use literature citations and how to prepare the Literature Cited section of their papers. Chapter 6 discusses the CBE (Council of Biology Editors) format for citing and listing references, along with examples of common variations of the CBE format. Coverage also includes guidelines for citing electronic sources. CBE format is elucidated by each of the sample papers in Chapters 4 and 5.

Many students are uncertain about how to begin a paper or how to revise it effectively. Chapter 7 discusses the process of drafting and revising, and presents the basics of each stage of the writing process—from brainstorming to composing the first draft, to final editing at the paragraph and sentence levels. To help students prepare their final drafts, Chapter 8 discusses manuscript format, provides proofreading strategies, explains how to write an Acknowledgments section, and lists symbols and abbreviations commonly used in biology.

Students often underestimate the role that writing can play in learning difficult material and in studying for examinations. Chapter 9 offers strategies for taking notes, getting the most out of textbooks, studying for short-answer questions, and preparing for laboratory exams. New to this chapter is a section on how to make effective laboratory drawings, with examples.

Finally, this third edition includes updated coverage of other forms of biological writing often faced by biology students. Chapter 10 presents strategies for preparing research proposals, letters of application, résumés, curricula vitae, and both oral and poster presentations.

Throughout the book I have tried to address the special demands and challenges of academic assignments in the context of how and why professional biologists write. I hope this handbook will convince students that scientific writing, including their own, need not be tedious and cumbersome, but can be clear, crisp, incisive, and engaging.

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