Successful Scientific Writing

The detailed, practical, step-by-step advice in this user-friendly guide will help students and researchers to communicate their work more effectively through the written word. Covering all aspects of the writing process, this concise, accessible resource is critically acclaimed, well-structured, comprehensive, and entertaining. Self-help exercises and abundant examples from actual typescripts draw on the authors' extensive experience working both as researchers and with them.

Whilst retaining the accessible and pragmatic style of earlier editions, this third edition has been updated and broadened to incorporate such timely topics as guidelines for successful international publication, ethical and legal issues including plagiarism and falsified data, electronic publication, and text-based talks and poster presentations.

With advice applicable to many writing contexts in the majority of scientific disciplines, this book is a powerful tool for improving individual skills and an eminently suitable text for classroom courses or seminars.

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Successful Scientific Writing

A step-by-step guide for the biological and medical sciences

Third edition

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Preface

Times change. Today the need to communicate science information effectively is perhaps more important than it has ever been, but the past decade has witnessed a significant revolution in the manner in which we gather, process, and communicate information. The twin technologies of the Internet and personal computers have changed the way nearly everyone works (and plays).

In keeping with the spirit of change, we have extensively revised, updated, and reorganized this third edition. Whether you are a first time author/speaker or a seasoned professional in the biological or medical sciences, we hope you find this step-by-step manual useful.

Because our preface message to you in the second edition still rings true for us, we are including it here as well. Enjoy.

JRM
RWM
2007

Preface to the second edition

Mend your speech a little, lest it mar your fortune.

– Shakespeare

The catch phrase "Publish or Perish" – or its more upbeat variant, "Publish and Flourish" – seems to have as much validity as ever in the minds of scientists everywhere. The scientific community has long emphasized quantity and quality of scholarly publications as a way to judge the eminence of scientists. Granting agencies appear to do the same. Scores received by renewal applications for National Institutes of Health funding for research in universities and hospitals have been shown to correlate very strongly with the number of publications resulting from NIH grants. Perhaps it is not surprising that the publication rate of scientific information doubles about every 12 years (Stix, 1994), although few of us will be likely to match the output of a Russian chemist whose scientific productivity over 10 years totaled 948 papers, or about one publication every four days!

All this writing . . . Does it really make any difference whether it is good, bad, or ugly? We believe it does, and that it matters a great deal, for words are tools of science no less than numbers are. Research is not complete until it is communicated, and publication in a refereed journal is the fundamental unit of scientific communication. The decision not only to write, but to make the effort to write well, lies at the heart of scientific literacy. To most minds, sloppy scientific writing indicates sloppy thinking, and both are disastrous to research and research reporting.

The published word has remarkable persistence. A sloppily written or prematurely published paper can haunt a scientist to the end of his or her days. Over 30 years ago, an examination of the reasons why research grant applications were turned down showed that 12% of the rejected proposals were not approved because the investigators' previously published work did not inspire confidence. Despite vast technological advances, there is no reason to expect that scientific writing is any less important today.

Still, we never set out to be writers. Few scientists do. During our graduate training, we learned about statistics, research, experimentation; we were taught to use instruments and techniques we have seldom encountered again. There

was never a word of guidance on writing a scientific paper, nor did we notice that this instruction was missing . . . at first. Once our working lives began we quickly learned that while a plumber can make a comfortable living without writing about his pipes, a scientist's career is inextricably enmeshed with (some would say enslaved by) the need to write. So, like most scientists, we have stumbled along, learning writing skills by trial and error – now and then helped along by a benevolent senior faculty member or a friendly colleague.

Now, as a new millennium begins, we find we have become that senior faculty member and, hopefully, those friendly colleagues as well. This guidebook is one outcome. Its goals are to help you to write effectively and efficiently, just as we would if we could meet with you in person. Because it forms such a major part of almost every scientist's written communication, the research article in a biological, medical, or veterinary medical journal is the book's main focus. However, the tips, techniques, and guidelines presented here apply to a variety of other writing contexts, from review articles to the popular press.

The first edition of *Successful Scientific Writing* began as a brief manual requested by graduate students and new researchers affiliated with the University of Georgia's College of Veterinary Medicine, and their colleagues in human medicine and the biological sciences. This edition has been reorganized and expanded to offer increased guidance, additional examples, and more hands-on exercises.

When you picked up this book, did you fear that it would center on split infinitives, case and tense, and other matters that sound only too much like English composition class? They will be covered – but we promise this won't be grammar class revisited. We do not aspire to present you with a comprehensive reference work or stylebook, chock-full of detailed grammatical and stylistic rules and obscure exceptions to them. Where such specialized information might be desirable, we try instead to point you toward relevant resources.

Efficiency and effectiveness include far more than wordsmithing. While good writing seems synonymous with a great deal of revising, rereading, and polishing, we believe that effective scientific writing is not as difficult to accomplish as many people try to make it. We hope to show you how to develop a strong organizational framework for both the task and the document, how to access the literature more effectively, and how to tailor your approach to your individual style. We have shared a potpourri of techniques which have been useful in our own writing – covering aspects as varied as overcoming writer's block, using word processors, and constructing tables and graphs. To illustrate the guidelines and suggestions, we have provided abundant examples and exercises, many of which are based upon actual manuscripts slated for publication in scientific journals in the biological and medical sciences.

Our scientific community is rapidly becoming an international one, and English is becoming a truly global language. New sections in this edition cover using the Internet and email, and special tips when writers and readers have different first languages. Because we are most accustomed to American spelling, grammar, abbreviations, and punctuation, we have usually followed American

conventions in these matters. However, we have tried to point out British equivalents or alternatives whenever possible.

Any book can only do so much, especially in as personal an area as writing. Learning to write skillfully is, always has been, and must continue to be a hands-on experience. However, it needn't be the random, slow, haphazard process that typically occurs in academic circles. Whether you use this book as an alternative to a formal course in science communication or to complement such a course, we hope that you will find that studying and applying this material increases your awareness of scientific writing style. Our goal is to help ease your approach to the writing that your chosen profession in the sciences will invariably call upon you to do.

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J. M. B.
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