

# ***BETTER SCIENTIFIC AND TECHNICAL WRITING***



*by Morris I. Bolsky  
AT&T Bell Laboratories  
Murray Hill, New Jersey*

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# BETTER SCIENTIFIC AND TECHNICAL WRITING



by **Morris I. Bolsky**  
**AT&T Bell Laboratories**  
**Murray Hill, New Jersey**

This book contains hundreds of principles for better scientific and technical writing. This book is **complete** ... it presents every principle that I know of and use. It's full of **examples**. It's **practical** ... based on my extensive experience, not just on theories and rules. It's **well organized, concise, and clear** ... thus it's easy and quick to read, and to refer to. And it **practices what it preaches** ... it is itself an example of better writing. (**Note** — Abbreviated Contents is below. Full Contents is on the inside back cover and facing page.)

## TO YOU, THE USER ... 4

## BETTER WRITING ... 13

### WRITING ... 23

Clarifying ... 23  
Developing ... 25  
Preparing ... 26  
Starting ... 28  
Editing ... 33  
Testing ... 34  
Following Up ... 37  
Reviewing ... 38

### DESIGN —

**PRINCIPLES** ... 40  
Accuracy ... 40  
Clarity ... 41  
Completeness ... 48  
Conciseness ... 50  
Concreteness ... 52  
Consistency ... 54  
Familiarity ... 58  
Integrity ... 60  
Organization ... 64  
Positiveness ... 66  
Preciseness ... 69  
Simplicity ... 73  
Timeliness ... 74  
Warmth ... 77

### DESIGN —

**BASIC ASPECTS** ... 83  
Cross-References ... 83  
Footnotes, Write-In Space ... 84  
Format ... 85  
Headings ... 87  
Notation ... 89  
Page Numbering ... 90  
Title/Acronym ... 91

### DESIGN —

#### BASIC SECTIONS ... 93

Covers ... 93  
Contents, Index ... 94  
Abstract ... 95  
To The User ... 96  
Overview, Introduction,  
Glossary ... 97  
Summary/Conclusions ... 98  
Appendices, References ... 100

### DESIGN —

**BASIC AIDS** ... 101  
Examples ... 101  
Illustrations ... 103  
Lists ... 104  
Performance Aids ... 106  
Procedures ... 108  
Tables ... 111  
Warnings ... 113

### DESIGN —

**PHYSICAL** ... 118  
Importance ... 118  
Color ... 120  
Computer Vs. Paper ... 122  
Form ... 123  
Highlighting ... 126  
Paper ... 127  
Readability ... 129  
Typefaces ... 133  
Usability ... 135

## PRODUCTION ... 136

## FAIRNESS ... 142

## GRAMMAR ... 155

## PUNCTUATION ... 163

## ACTION VERBS/ ABSTRACT NOUNS ... 184

## REFERENCES ... 186

## INDEX ... 187

## CONTENTS ... 194

## BASICS ... Outside Back Cover

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## ***THIS BOOK IS DESIGNED TO BE USER FRIENDLY***

### ***Clear, Fast Understanding***

- Complete, accurate information.
- Clear, consistent organization, with many headings and subheadings.
- Bullet lists, rather than long sentences and paragraphs.
- Numerous examples illustrate every principle.
- Bold italic type used to emphasize key points.

### ***Instant Reference***

- Short Contents on outside front cover.
- Complete Contents on inside back cover and facing page.
- Complete Index at end of book.
- Summary information on outside back cover.
- Main headings start on new page.
- Headings in large, bold italic type.
- Page numbers in large, bold italic type, on outside top corner of each page.
- Cross-references give page numbers, as well as section headings.

### ***Easy Reading***

- Simple, clear, concise language.
- Simple, short words, sentences, and paragraphs.
- Personal tone and active tense.
- Ragged-right lines, without hyphenation, make for easier, faster reading.
- Clean type style, of easily readable size.

### ***Easy Use***

- Flexible covers.
- Light in weight. Can easily be carried in a briefcase.

## ***TO YOU, THE USER OF THIS BOOK***

### ***DEDICATION***

I dedicate this book with love and gratitude to my Mother, Thelma Bolsky, who passed on, on November 11, 1984, Veterans Day. She was a real veteran who loved God and all of God's creation. Her whole life was devoted to loving and helping people. I pray and know that she still does so.

I also dedicate this book with love and gratitude to my Father, David Bolsky, a fine person who passed on many years ago.

"The Lord bless you and keep you.

May God's face shine upon you and be gracious to you.

May God look upon you kindly and give you peace."

(Blessing of Saint Francis of Assisi)

### ***WHO THIS BOOK IS FOR***

This book will be useful in college and industry courses on writing.

This book will be useful to management, technical, and professional people, as a comprehensive reference handbook. These people, to whom writing is important, but who usually devote a small part of their time to writing, may wish to skim over this book ... then to study in detail sections that interest them ... and finally, to refer to this book as needed.

Technicians, secretaries, clerical people, and others do some writing. These people may also want to skim over this book, study in detail sections that interest them, and refer to this book as needed.

Those who devote most of their time to writing, may want to read all of this book.

This book has many ideas that can be useful to people in their personal writing, to help make letters, notes, etc., clear and specific.

## **TERMINOLOGY USED IN THIS BOOK**

### ***Users, Not Just Readers***

Your document, or whatever it is that you are writing, will be **used** by people, not read for entertainment. That's why I use the term **users** in this book, rather than "readers."

These users are your customers — whether they are associates in the office next door, or consumers in the marketplace. Whoever they are, how well you do on the job depends on your pleasing them. So ... stay close to your customers. Make sure that you know who they are, what they **need** and **want**, and how you can best give it to them.

### ***Documents***

The principles in this book apply to any kind of informative material, both technical and non-technical — articles, books, booklets, documents, handbooks, letters, manuals, memos, papers, plans, proposals, reports, resumes, and speeches. For the sake of consistency, I use the term **documents** in this book.

### ***Better Examples Shown First***

This book contains many examples. One reviewer suggested that examples might have more impact if the poorer way was shown first, and then the better way. However, I show the **better way first**. I believe that the way a person sees **first**, is the way that they are likely to remember the best.

## ABOUT THE WRITING STYLE OF THIS BOOK

My writing style differs from the *sentence-and-paragraph* style that is usually taught in school, and that is used in most writing. That style is fine for "literature" type material — fiction ... and non-fiction articles, books, etc., intended to entertain or to inform lightly, rather than to inform in detail or to instruct.

My style is *heading-list-and-example* based. That is —

- **Headings** — Instead of several paragraphs or even pages without headings, I use many headings and subheadings, so as to organize the material as much as possible.
- **Lists** — Instead of presenting information in sentences and paragraphs, I use bulleted lists as much as possible.
- **Examples** — Instead of writing at length about the ideas that I wish to convey, I write about them as briefly as possible and then I *illustrate* them as much as possible.

I believe that heading-list-and-example style is more effective for informing users in detail, and for instructing them. This style —

- Lends itself to better organization.
- Is more clear and precise.
- Requires fewer words.
- Takes less time to read and refer to.

Of course, many people are used to, and may prefer the sentence-and-paragraph style, and there are good books on that style. One reviewer of this book felt that that style might be easier to read, perhaps especially for beginners. I disagree. However, I'm sure that there's a place for both styles. (See *Pleasantness* on page 16.)

The writing style that I both present and use in this book is similar to that which I used in my three books on computers. Prentice-Hall, the publisher, has received favorable comments on the writing style of these books, as well as on the content, and I have also. In case you are interested in these books, they are ***The C Programmer's Handbook***, ***The VI User's Handbook***, and ***The UNIX<sup>®</sup> System User's Handbook*** (UNIX is a trademark of AT&T).

Typical of the comments received about these books by Prentice-Hall, and by myself about these books and about other material that I have written at AT&T, are the following (I present these comments just to show that users like this style) — "It is everything a handbook should be. Short, clear, easy to use, to the point, and complete." ... "Excellent reference material. Very well organized, very well structured. Well put together. Well thought out." "It is the closest thing to a real handbook that I have ever seen."



## **THIS BOOK CONTAINS PRINCIPLES, NOT FORMAL RULES**

One of the reviewers of the draft of this book said, "Parts of the book contradict advice given. For instance, on page 15, titles are not parallel (violating advice given on page 87)." It's true. The paragraph title "First And Foremost" on page 15, isn't parallel with the following titles in that section — "Integrity," "Warmth," "Organization," etc. However, I feel that the point that I make in the "First And Foremost" paragraph should be emphasized with that heading, and that making the emphasis is more important than is making the titles parallel.

That reviewer, and others, may disagree with me. They may feel that making the titles parallel is more important. But I do have what I consider to be a good reason for not being parallel.

The reason that I bring this up, is to ask you to regard the material in this book as *principles* for good writing, not as formal rules. Don't feel that you must follow every principle, exactly as it's given. Adapt the principles to your writing style, and to what the users of your document need and want.

## **COMPUTER TOOLS FOR WRITING**

If you do your writing on a computer ... or if you have access to a computer and you have the skill and the time, or if you have a typist to enter your document into a computer ... then you may want to find out about computer programs that aid writers. There are spelling and thesaurus programs. There are also programs to check grammar, punctuation, word and sentence length, writing style, etc. One program that does much of this is the **UNIX System WRITER'S WORKBENCH Program**, developed by AT&T.

## **SUGGESTIONS FOR USING THIS BOOK**

You can use this book as a text for study on your own ... as a text in a course on writing ... and/or as a reference book. I'll list each section of the book here, and briefly tell you what it's about.

However, before listing the sections, I'll first discuss the aids to using this book.

- **Brief Contents** on the outside front cover.
- **Complete Contents** starting on the inside back cover and facing page.
- **Index** starting on page 187.
- **Basics** section on the outside back cover, with a very brief summary of basic principles for better writing.

**Note** — Read through the following three sections, if you want to.

**TO YOU THE USER** — Contains introductory information.

**BETTER WRITING** — Also introductory in nature. Briefly discusses what better writing is about and why you may want to bother to write better.

**WRITING** — Discusses the steps in writing — Clarifying ... Developing ... Preparing ... etc. You may be especially interested in the Starting section, which has dozens of ideas for countering "writer's block" ... when you don't feel like writing.

**Note** — The rest of this book contains reference type information. You can read through these sections, or just skim through them so as to become familiar with them, and later refer to the information and the examples as needed.

**DESIGN — PRINCIPLES** — Discusses what I consider to be *the* basic principles for better writing — Accuracy ... Clarity ... Completeness ... etc.

## 10

**DESIGN — BASIC ASPECTS** — Discusses the types of basic support information that many documents need — Cross-References ... Footnotes ... Format ... etc.

**DESIGN — BASIC SECTIONS** — Discusses the types of basic sections that many documents need — Covers ... Contents ... Index ... etc. It's arranged in the order that these sections would normally appear in a document.

**DESIGN — BASIC AIDS** — Discusses the types of aids to understanding that many documents need — Examples ... Illustrations ... Lists ... etc.

**DESIGN — PHYSICAL** — Discusses the Importance Of The Physical Design Of A Document ... Color ... Computer Vs. Paper Documents ... etc. It's a subject that isn't often covered in books on writing, but that I feel is important to know about, as it opens up different options to you.

**PRODUCTION** — Discusses Typing ... Proofreading ... Printing ... and Distribution of a document. Perhaps you can leave these matters to others. Even so, I think it's important for someone who writes a lot to know about these matters.

**FAIRNESS** — Discusses, in detail, how to avoid sexism in writing. It's summarized and adapted from a Prentice-Hall guide for authors.

**GRAMMAR** — Discusses and illustrates basics such as Modifiers ... Dangling Modifiers ... Misplaced Modifiers ... etc. This and the following two sections are summarized and adapted from U. S. Government publications.

**PUNCTUATION** — Discusses the mechanics of Acronyms ... Apostrophes ... Brackets ... etc.

**ACTION VERBS/ABSTRACT NOUNS** — Lists action verbs, and the corresponding abstract nouns which writers often use instead of the action verbs. The action **verbs** are easier to understand.

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Karen Olson, who helped and encouraged me at the time of my Mother's passing on, and who is helping so many people in her work with the homeless.

John Wait, my editor at Prentice-Hall.

My Search For God Study Group.

You, the user of this book. This book represents my philosophy of communicating by the written word. Thank you for reading this book and thus giving me the opportunity to share this philosophy with you. I hope that you find it of value.

**PERSONS AND ORGANIZATIONS QUOTED**

Also, I want to acknowledge the following persons and organizations, whom I have quoted in this book. The page numbers on which the quotes appear, are shown in the Index starting on page 187.

- American Press Institute
- Carolyn Boccella Bagin
- Business Week Magazine
- Winston Churchill
- Document Design Center
- Jo Van Doren
- Robert D. Eagleson
- **FORTUNE** Magazine
- Joseph M. Fox
- Harold S. Geneen
- Laura Grace Hunter
- John F. Kennedy
- Henry Wadsworth Longfellow
- W. Somerset Maugham
- George Orwell
- Blaise Pascal
- Norman Vincent Peale
- Prentice-Hall College Division
- Will Rogers
- David A. Schell
- James R. Squire
- Mark Twain
- U. S. Government Printing Office
- **The Wall Street Journal**
- C. A. Warren
- Westinghouse Electric Corporation
- Jan V. White
- Frank Lloyd Wright

## BETTER WRITING

### WHY WRITE AT ALL?

Often we are tempted just to tell something to people, rather than taking time to put it in writing. But there may be good reasons to put it in writing, even though it takes time and effort to do so.

This section discusses reasons for writing, when you have the choice of writing or of just talking to the persons involved. Often, of course, you don't have such a choice, as when you have to communicate formally to persons higher in your organization than you are, or to customers.

- **Reputation** — Better writing is important to do your job more successfully, and to enhance your reputation as an expert on the topic and as a good communicator. It is thus a stepping stone to higher level positions. Written material, whether it be a short memo or a long document, is very **visible**. Several, perhaps many people read what you write. If you write poorly, it reflects poorly, not just on your writing ability, but on **you**. And if you write in an outstanding way, then this reflects well on you in every way.
- **Schedules** — It may be difficult to get everyone together who needs to know the information. A document may help avoid having to call a meeting. Or, by preparing people with the information, a document may cut down the number of meetings that need to be held, and their length.
- **Accuracy And Self-Instruction** — You are likely to spend more time clarifying and organizing your thoughts, getting more information, checking on details, etc. if you write a document, than if you just tell the information to people. This extra effort will increase your knowledge of the topic and also the knowledge of the users of your document.

## 14

- ***Extra Information*** — You can attach extra information that may be useful, as well as provide references, in a document.
- ***Record*** — Both you and the recipients of your document will have a record of the information. Moreover, you will all have the same record, whereas if you just tell information to people, each person will have a different interpretation of it.
- ***Official Record Of Transmission*** — A document is a ***must*** to officially transmit information, policies, directions, decisions, etc.

## WHAT IS BETTER WRITING?

Correct grammar is important. But most people already know grammar reasonably well. Certainly we all make mistakes. Even the experts. And since different schools of grammar have different rules, it's impossible to please everyone. I don't recall reading any document that I felt was unacceptable from the grammatical standpoint. Do you? On the other hand, much of what I read, I consider unacceptable from the standpoint of the aspects listed below. The most important aspects of better writing, in my opinion, are —

- **First And Foremost** — No matter how technical and impersonal your document may appear to be, its purpose isn't to describe objects. Its purpose is to **help people** ... the people who will use your document, and the people who will use the product or service that those who use your document are working on.

You aren't working with words, but with **information** and **ideas**. If you believe that you are working with words, then you will think that the more and the fancier the words, the better ... thus lowering the value of your writing. And this is what many writers do think, and do. But the words aren't the goal. They are only the means. **The goal is to help people by communicating information and ideas to them.**

- **Integrity** — Every word that you write may be perfectly true. But if you ignore, gloss over, or cover up unpleasant details, then what you have written isn't honest. Give the truth, the whole truth, and nothing but the truth.

"The truth is more important than the facts."

(Frank Lloyd Wright)

- **Warmth** — Users want to know, **What does this mean to me? Why is this important to me? How will this affect me? What do I need to do about this?**



- **Organization** — Your writing reflects your thinking. If your writing is disorganized, it likely means that your thinking about the topic is disorganized. By taking time to organize what you write about a topic, you are really *investing* your time in organizing your thinking about it. Equally important, you should make the organization highly visible, with many headings and subheadings. "The University of California recently established a special faculty committee ... to study the prevalence of substandard writing among undergraduates. ... Its most conclusive finding was that difficulties in organization and structure predominate in poor writing; proficiency in the techniques of grammatical usage seemed a corollary of general ability to organize material logically. ... In short, good writers tend to be those concerned with organization, with the problems involved in forming relationships. The poor writers are those concerned primarily with mechanics. Moreover, poor writers, unlike the good, are totally unable to recognize good writing in others. One wonders whether those of us who have concentrated on spelling, punctuation, and vocabulary in our classes — that is to say, concentrated on writing rather than composition — have contributed to this disability in any way." (James R. Squire, "Tension on the Rope — English 1961")
- **Simplicity** — Use the simplest language possible. Never mind that you may be writing for PhDs. They need and want simple writing just as much as anyone else does.
- **Conciseness** — Here I refer, not to cutting out a word here and there, but to combining or eliminating duplicate and overlapping sections. This is another aspect of organization ... of clarifying and simplifying your thoughts.
- **Clarity** — Only after you have organized your writing, should you start clarifying and simplifying the paragraphs, sentences, and words.
- **Pleasantness** — One reviewer felt that sentence-and-paragraph style may be more pleasant to read. But I feel that heading-list-and-example style is clearer and quicker to read and to understand ... and thus, more pleasant. Perhaps most documents should consist of material in both types of styles.