OPPORTUNITIES in Technical Writing Careers

- Boost your earning potential
- Get the inside scoop from experts in the field
- Find the information you need to succeed

JAY R. GOULD AND WAYNE A. LOSANO

Mc Graw Hill

OPPORTUNITIES

in

Technical Writing Careers

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REVISED EDITION

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New York Chicago San Francisco Lisbon London Madrid Mexico City
Milan New Delhi San Juan Seoul Singapore Sydney Toronto

0-07-164193-9

The material in this eBook also appears in the print version of this title: 0-07-149311-5.

DOI: 10.1036/0071493115

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The Field of Technical Writing

Different forms of writing have been used to relay information since ancient times. People have communicated facts, lore, data, news, science, wisdom, and entertainment in writing using methods ranging from ancient cave drawings and hieroglyphics to the latest bestseller, computer manual, or blog.

Writing can be broadly classified into two categories: fiction and nonfiction. The novelists, short-story writers, poets, screenwriters, and playwrights who produce fiction manipulate words and language to create scenes, moods, and effects so readers can feel as though they are unobserved, passive participants to the events described. Nonfiction writers present facts and data in a variety of formats, including magazine and newspaper articles, books (textbooks, biographies, how-tos, self-help, travel guides, and more), booklets, reports, brochures, memoirs, manuals, journals, newslet-

ters, advertising copy, and even the text inside the pages of the phone book.

What Is Technical Writing?

Technical writers write, edit, and prepare publications in many fields of technology, science, engineering, and medicine, including articles for technical and scientific journals, both in print and online. The publications may be technical reports, instruction manuals, articles, papers, proposals, brochures, and booklets and even speeches for technical meetings and conferences.

Technical writers must remain objective and factual about the subject matter they are dealing with. Their sole function is to write dispassionately about facts and objects and to relate useful, relevant, reliable information that readers can understand. The language they use must be simple and direct and contain a minimum of nonfunctional descriptive adjectives. Their verbs must be in the active rather than the passive voice to eliminate any doubt about what the writing means or implies.

Any writing that requires familiarity with (or willingness to learn about) a technical field would be considered technical writing. Writing about museum conservation is technical writing as much as writing user manuals for a software product or a troubleshooting guide for a broken tractor. Technical writing is a useful communication tool whenever information of a technical nature must be transmitted.

Need for Technical Writers

The twentieth century saw a sharp rise in the amount of nonfiction material produced, largely because of the nearly continuous

advances and developments in technology, which shows no signs of slowing down. Thanks to this rapid and abundant increase, there is a growing demand for technical writers.

In the early days of technical writing, people with scientific and technical backgrounds were given writing assignments for which they weren't prepared or qualified. Not surprisingly, much of the writing they produced was often very poorly composed, stilted, and boring. This in no way reflects on the intelligence or education level of the writers, but represents the difficulty of merging technical knowledge with writing skills to produce an acceptable product. It is not unusual for highly educated technicians to produce poor-quality writing because their training and experience have not focused on verbal and written skills. On the other hand, writers with no scientific background had difficulty understanding how to present and interpret scientific data and subject matter so that the reader would be properly informed.

The need for technical writers arose because these situations almost always guaranteed poor results. Managers were often less concerned with the quality of the writing than with simply having the work done. Sometimes the writing was so poor that readers failed to derive any usable information from it. For example, if the assignment was a construction manual for a process or a use manual for a piece of equipment, the results could be disastrous and detrimental to business.

Sharing Your Knowledge

Technical writers have another important function: to teach others about their profession. One technical writing graduate who works for the Federal Energy Regulatory Commission has led instructional seminars in technical writing for her colleagues.

This writer has the potential to go far because she has jumped into a new area and demonstrated her ability to explain, describe, and illustrate. These characteristics will help her immeasurably in preparing training programs.

Making a Name for Yourself

Will you become famous as a technical writer? It's highly unlikely. In fact, technical writers are often, by necessity, anonymous authors who don't get to see their byline attached to their work. (The exceptions to this rule of anonymity are people who write scientific or technical articles for newspapers, magazines, and scholarly publications under their own names or who write popular how-to guides.)

If you're wondering why most technical writers don't have a byline, think about the last time you tried to assemble a new barbecue grill or program a home entertainment system. Even the most effectively written instruction manual may leave some users frustrated, wishing they could lodge a complaint directly with the person who wrote the instruction manual. That's reason enough for the writer's anonymity!

But that aside, most employers who produce technical material want to reach their audience with concise and easy-to-understand language and to promote their product or train their audience in its use. No writing stars are required or encouraged.

With that said, you can still build a name for yourself through your list of credits. Every assignment you complete becomes another item to add to your résumé, and in some cases you might even be able to keep a sample of your work and create a professional portfolio to show to new clients. Word of mouth and employer and

client references and recommendations also will help you to become known in your area of specialization.

Job Titles

Although the term *technical writer* is the most common job title used, there are other titles as well as ranks.

Assistant technical writer
Associate technical writer
Consulting technical writer
Copyeditor
Copywriter
Corporate technical writer
Course developer
Curriculum designer
Curriculum planner
Documentation contractor
Documentation specialist
Education specialist
Information systems writer
Instructional designer
Junior technical writer
Knowledge analyst
Lead technical writer
Senior technical writer
Software technical writer
Technical communicator
Technical editor
Technical intern

Technical translator
Trainer

Areas of Specialization

The areas in which a technical writer can work are vast and varied, but most specialize in just one, sometimes two, areas. For example, a medical writer wouldn't be expected to be knowledgeable about software or the environment, just as an advertising writer wouldn't necessarily be familiar with agriculture.

This list of fields that need technical writers is just a guide. Your own research will no doubt help you add to it.

Advertising
Agriculture
Architecture
Armed forces
Computer system documentation
Corporate communications
Education
Electronics
Engineering
Entertainment
Environment
Film and documentaries
Finance and banking
Government
Graphics design
Information development
Instructional design

Insurance
Investments
Journalism
Manual writing
Manufacturing
Market research
Mechanics
Medicine
Multimedia specialist
Pharmaceuticals
Proposal writing
Public relations
Publication management and design
Publicity
Research firms
Sales
Science
Telecommunications
Video production
Web page authoring and site design

The different specializations and the type of writing that technical writers do in various areas will be covered in greater depth in Chapter 4.

Disastrous Effects of Bad Technical Writing

Technical writing should never confuse the reader. The example that follows is a piece of writing that proved to be dangerously ineffective. (This letter is part of the public record.)

Babcock & Wilcox Company
IR Generation Group

TO: Manager, Plant Integration, Three Mile Island
FROM: Manager, Plan Performance Services, Babcock & Wilcox
Subject: Operator Interruption of High Pressure Injection (HPI)
References: Two titles listed

References 1 and 2 (attached) recommend a change in Babcock and Wilcox's philosophy for HPI system use during low-pressure transits. Basically they recommend leaving the HPI pumps on, once HPI has been indicated, until it can be determined that the hot leg temperature is more than 50°F below Tsat for the reactor cooling system (RCS) pressure. Nuclear Service believes that this mode can cause the RCS (including the pressurizer) to be solid. The pressure reliefs will lift, with a water surge through the discharge piping into the quench tank. We believe the following incidents should be evaluated:

1. If the pressurizer goes solid with one or more HPI pumps continuing to operate, would there be a pressure spike before the relief valves open, which could cause damage to the RCS?
2. What damage would the water surge through the relief valve discharge piping and quench tank cause?

To date, the Nuclear Service has not notified our operating plants to change HPI policy consistent with References 1 and 2 because of the above-stated questions. Yet the references suggest the possibility of uncovering the core if present HPI policy is continued. We request that Integration resolve the issue of how the HPI system should be used. We are available to help as needed.

Signature

Did you actually read all that? Probably not—and neither did the plant manager at Three Mile Island. Babcock & Wilcox Company's intention for the above letter was to warn Three Mile Island managers that they could uncover the reactor's core (and thus possibly have a nuclear meltdown) if certain operating procedures were not changed. As you may recall, a nuclear meltdown is exactly what happened. How would you revise that letter?

Examples of Good Technical Writing

Advances in technology and science are leading to more variety in technical writing. As new terminology, theories, instruments, processes, and machinery are developed, others are discarded—an ongoing process that makes relatively new equipment and procedures obsolete almost before the packing crates are opened. Scientists in every field are constantly striving to make new discoveries, which means that technical writers must replace old paragraphs with new ones at a feverish pace. Several examples of scientific writing are cited below.

Example One

> The velvet background on a painting of Elvis looks black because it reflects so little light. But getting a surface to reflect no light at all is surprisingly difficult. Now researchers have created a virtually reflection-free surface by coating it with filaments only a few billionths of a meter thick.
>
> Improved antireflective surfaces might have many uses. For example, they could eliminate light-wasting reflections in fiber-optic telecommunications, or the surfaces could brighten low-power light-emitting diode (LED) lamps.

> Applied to a clear surface, the coating would make a lens absorb more light, increasing its transparency. On an opaque surface, the filaments would make a silicon solar cell, for example, almost perfectly absorbing. . . .
>
> Light rebounds when it strikes the boundary between two materials that have different "refractive indices"—measures of how fast light travels through the substances. For example, sunlight bounces off the surface of a pond because light travels more slowly in water than in air. The greater the difference between the refractive indices of any two materials, the more light is reflected.[1]

Example one is the beginning of an article that appeared in *Science News* and was written by a professional science journalist. *Science News* is a weekly periodical as well as online newsmagazine published by the Society for Science and the Public, which was founded in 1921. It covers the latest developments in medicine, pharmacology, and the natural sciences. The articles vary in length, ranging from a single paragraph to several pages. The subscribers are primarily scientists who want a quick overview of what is occurring in other sciences. However, many nonscientists are also regular readers because the articles are well written and understandable to the lay reader. Subscribers also include professional and educational institutions.

Example Two

> In a development that promises to ease structural analysis of proteins, British researchers have found a way to determine protein structures by using only basic and easy-to-obtain data complemented by theoretical calculations.

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1. Barry, Patrick L. "The New Black: A Nanoscale Coating Reflects Almost No Light." *Science News* 171(9), 3/3/07, p.132.

> The new approach, based on nuclear magnetic resonance (NMR) spectroscopy chemical shifts, is faster and simpler than conventional NMR methods.
>
> Typically, NMR protein structures are based on interatomic distances, but these are difficult to measure. On the other hand, chemical shifts are the most readily obtained and accurate NMR parameters. They provide information about the molecular environment of atoms. They're used to determine structures of small molecules, and they're usually the first thing chemistry undergrads learn about NMR. . . .
>
> Researchers have wanted to use chemical shifts to determine protein structures because that sidesteps the need to make time-consuming nuclear Overhauser effect (NOE) measurements. NOEs, which are pairwise distances between specific atoms, are currently the primary basis for most NMR protein structures.[2]

The article in example two appeared in *Chemical and Engineering News*, a member-supported weekly magazine of the American Chemical Society. This publication and online resource covers all the news of the chemical world, including recent advances in research, industry, education, funding, and regulations. The article was written by a staff correspondent who specializes in biochemistry, medicinal chemistry, analytical chemistry, organic chemistry, and combinatorial chemistry. Those who write for the magazine must be able to handle highly complex ideas and terms and still be able to write an interesting story that is easy to understand. The author of this particular article does have one distinct advantage: most of his readers are chemists. Nevertheless, few of them will have detailed knowledge about the field of work being described.

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2. Borman, Stu. "Fast Route to Structures: Technique Defines Protein Structures from NMR Chemical Shifts." *Chemical and Engineering News* 85(23), 6/3/07, p. 10.

Example Three

> Some 10,000 years ago, somewhere in the Near East, an audacious wildcat crept into one of the crude villages of early human settlers, the first to domesticate wheat and barley. There she felt safe from her many predators in the region, such as hyenas and larger cats.
>
> The rodents that infested the settlers' homes and granaries were sufficient prey. Seeing that she was earning her keep, the settlers tolerated her, and their children greeted her kittens with delight.
>
> At least five females of the wildcat subspecies known as *Felis silvestris lybica* accomplished this delicate transition from forest to village. And from these five matriarchs all the world's 600 million house cats are descended. . . .
>
> Five subspecies of wildcat are distributed across the Old World. They are known as the European wildcat, the Near Eastern wildcat, the Southern African wildcat, the Central Asian wildcat, and the Chinese desert cat. Their patterns of DNA fall into five clusters. The DNA of all house cats and fancy cats falls within the Near Eastern wildcat cluster, making clear that this subspecies is their ancestor. . . .[3]

The paragraphs in example three are the beginning of an article by a scientific reporter and editor who is on the staff of the *New York Times* science section. The article goes on to discuss cat DNA and the animal's domestication.

You will notice the style of writing in this article is much more accessible to the lay reader, who does not need to have any particular training or knowledge to comprehend the topic. The *New York Times*, in which this article appeared, is a mainstream publication

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3. Wade, Nicholas. "Study Traces Cat's Ancestry to Middle East." *New York Times*, www.nytimes.com/2007/06/29/science/29cat.html?ref=science, visited 6/29/07.

read by a much more diverse audience than those in the previous examples. The author of the article clearly understands his readership and has been able to craft his writing so that, although it includes technical terms and concepts, it is not so technical as to be not easily understood by the publication's average reader.

Example Four

> Explore the effects of color mixing with light with this eye catching demonstration.
>
> The fascinating phenomenon of color mixing is conveyed using LED technology. A great alternative to traditional ray box and filters, the ultra bright LEDs of the Color Mixing Apparatus prevent the need for full blackout.
>
> This apparatus is comprised of six large bright LEDs, two each of red, green, and blue. The brightness of these LEDs can be adjusted using the control box, and either the inner or outer ring of lights can be selected, for a full range of experiments. Set the apparatus in full rotation and use with the included screens to demonstrate both additive and subtractive color mixing. Using a blank white screen and the color mixer, you can highlight how color is perceived; use the black screen with aperture for projecting circular patches of light; or use a clear screen with an eclipse disc for blocking light.
>
> When you use the apparatus in conjunction with the various screens, you can highlight the way we see color and also how colored light is created. . . .[4]

Example four is a product description taken from an online catalog of scientific products. The catalog is intended to take the place

4. Sargent-Welch Online Catalog, www.sargentwelch.com/product.asp_Q_pn_E_WLS1751%2D72%5FEA_A_CENCO+Color+Mixing+Apparatus_E_, visited 6/29/07.

of a salesperson by giving prospective buyers a brief, concise, and accurate description of a scientific apparatus. The catalog must give potential customers complete information on all its items so that they will be able to order precisely what they want. The emphasis in this type of writing is to provide necessary information using a minimum number of words. For this reason, complete sentences are not always used.

As you can see from the four preceding examples, the field of technical writing is broad and can cover preparing articles to go in everything from a highly specialized journal to a syndicated story in a large, influential newspaper.

Where to Find Jobs

Chapter 3 will cover the job hunt, helping you to learn what kinds of jobs are available and how to locate them. But as a starting point, one of the best ways to get a feel for the various types of work available to technical writers is to read job advertisements. They often list the duties and required experience and show you the wide variety of environments and specializations in which technical writers work.

You can find job advertisements in any Sunday newspaper or on the Internet. The Society for Technical Communication has an active database of job openings in eight different regions in the United States and Canada. Contact information is provided in the appendix.

Sample Job Advertisements

Note that the following job announcements do not have contact information because they have already been filled.

Position: Technical Writer
Job type: Permanent
Company: Technical publications firm
Location: Midwest

Duties: Preparing new and revised information for use in technical service manuals, user manuals, and operator manuals in the agricultural and heavy equipment fields. Technical writer will be responsible for coordinating material from engineers, dealers, and other sources. Other responsibilities include reading blueprints and detailed engineering documents, marking up artwork for illustrator, and interacting with engineers, product specialists, and other technical writers to learn about parts installation and operations.

Requirements: A high school diploma, in addition to vocational, career, or related technical studies in technical writing or other engineering discipline and one to three years technical writing experience. An understanding of hydraulic, electrical, and mechanical systems is required.

Tool skills: Proficient with a personal computer, copier/duplicator, and various software including desktop publishing, spreadsheet, word processing, illustration, and database programs.

Position: Technical Writer
Job type: Temporary/Contract
Company: A gateway security firm
Location: Southeast

Duties: Researching and writing technical information and procedures for manuals and online help; developing technical illustrations and graphics to support written material; editing technical documentation; and testing documented procedures.

Requirements: Bachelor's degree and four to six years of related writing or technical experience; excellent research and writing skills; background in high-tech industry, preferably with Internet and networking technologies.

Tool skills: Experience with RoboHelp, Word, and HTML highly desirable.

Position: Technical Writer
Job type: Permanent
Company: IT software firm
Location: Eastern Canada
Duties: Plan, organize, write, edit, and test software manuals, developer guides, and online materials; work closely with software development team to research documentation requirements and content; read code written by developers, as well as translate specifications written by developers into information that customers can use, and develop and maintain custom publishing tools.
Requirements: B.A./B.S. in computer science; electrical, civil, or mechanical engineering, or equivalent experience; experience writing user documentation and tutorials; ability to produce quality documentation with aggressive deadlines; and demonstrated ability to communicate technical information clearly.

Position: Technical Writer
Job type: Full-time
Company: Agricultural manufacturing firm
Location: Western Canada
Duties: The successful candidate will be responsible for writing all technical product documentation for clients, including generating manual content, technical writing, graphics, and layout. The position provides support to the Engineering Department.
Requirements: A diploma in technical writing, CAD/CAM technology, or mechanical engineering technology, as well as experience in designing and producing technical manuals for mechanical equipment.

Position: Medical Writer
Job type: Contract
Company: Pharmaceutical firm
Location: Southeast
Duties: Preparing, reviewing, and editing clinical regulatory documents and publications; preparing documents for regulatory submissions in collaboration with clinical research, medical, and

statistical personnel; and preparing, reviewing, and editing reports, study protocols, and manuscripts.

Requirements: B.A./B.S. in life sciences, five years' experience in preparation of clinical documentation; experience with regulatory commissions; overall knowledge of the clinical trial process.

Qualities Necessary for Success

The two most important questions you must ask yourself before embarking on a career in technical writing are, "What kind of person should I be to succeed in this field?" and "What kind of personality traits should I have?" Some of the answers are obvious and are similar to traits that make people successful in any business or profession. You should be persistent and forceful, but not overbearing, in seeking the information you need. It goes without saying that you should enjoy writing. You must be a self-starter with a keen analytical mind who is at ease with management and can speak its language.

You also must have the capacity to assume responsibility and be willing to learn continuously about your field. The refusal or inability to stay on top of your job is the quickest route to unemployment. Working in the field of technical writing requires constant self-improvement. This is a highly competitive field, and you will find that an employer will have little trouble hiring your replacement if you don't produce high-quality work and stay well informed.

To be sure that you have the qualities you'll need to succeed, it's a good idea to set up a program of constant self-improvement and stick to it. Here are some of the ways you can accomplish this.

- Enroll at a local college or university night school for an advanced degree.

- Enroll at a local college or university night school and take some relevant courses each semester.
- Keep up with the literature in your field.
- Enroll in any company-sponsored courses.
- Attend as many technical seminars and conferences and take as many short courses as you can.

Another personal quality that is essential for the technical writer might surprise you: it is an interest in both the arts and sciences. Technical writers often deal with graphic artists and technical illustrators, and having some appreciation of their skill and ability will make your interactions more successful. You should know the basic principles of good composition in an illustration or a photograph and why certain kinds of graphics are appropriate for one situation but not for another.

You must also develop a sense of objectivity and should be able to place things in their proper perspective, unaffected by personal bias. The new hire who starts out saying "This is not the way we did it at my other company" (or at school) is in for a rude awakening. Industrial publications must be processed in the shortest possible time, and the publications department has probably already established a procedure that fits the company perfectly. The new technical writer should be able to recognize this and adjust to it.

There are other things to consider as well. A private engineering firm, distressed at some of the personnel interactions, distributed this memo to its employees.

> The success of an engineering enterprise depends on the cooperation and interaction of administrators, engineers, and technical communicators. An engineering firm's administration must con-

sider the individual personalities and the interaction of all the people it has on board. We will endeavor to look for prospective employees with the following characteristics:

- **All members must regard themselves as being players on a team, with each one having a specific function.** A large part of participants' time may be spent outside their field getting information and data from engineers and working with other publications personnel, printers, and illustrators.
- **They must also be capable of dealing with details and minutiae.** Many times the technical writer is anxious to get the job done as quickly as possible, but quotations must still be authorized, statistics checked, and all kinds of calculations verified. Very often a highly technical scientific project will require gaining an intimate understanding of the subject before proceeding with the actual writing. The report that is subsequently written may require collecting and compiling large amounts of technically accurate, detailed data prior to its publication. If you are averse to working through the unglamorous aspects of writing, you probably will not make a good technical writer.
- **They must be tactful.** The job of editing requires a high degree of diplomacy. The less people write and the less skillful they are, the more sensitive they will be to criticism about their literary craftsmanship. For generations, engineers have been told they do not write well. Thus, they may resent being criticized by professional writers. Tactfulness does not imply cowardice. It simply means that the writer has to cultivate a rapport with engineers and scientists and know how to offer constructive corrections and suggestions about their writing.

Employers judge prospective employees by their training and education. But the best training in the world may not get you the job if you are lacking certain personality traits. Technical writers are people, not machines; they must work with other people.

The manager of publications and illustrations at a defense company emphasizes the importance of the interaction between technical writers and others in the company:

> Tact and diplomacy are so important to the writer-editor that too much cannot be said of them. When preparing an original manuscript, the writer must establish and maintain open lines of communication between himself and the source of the material. . . . In an editorial capacity, the writer-editor must rely on his power of friendly persuasion. . . . Initiative and an inquisitive nature are as important as a keen, well-developed sense of order. . . . The very nature of communication forces the writer-editor to work at once independently and jointly.

Most interviewers can accurately judge the personality traits of people who will be readily accepted by their fellow workers.

Advances in computers and software have raised the expectations of what is required and demanded of both novice and veteran technical writers. At a recent executives' meeting in a large company that employs hundreds of technical writers, a lengthy discussion ensued concerning what the company expects of its writers. The list of requirements and expectations was staggering. In addition to writing and editing skills, the company expects that its writers will become familiar with graphics management, especially the layout and design of documents. They must be able to turn out documents that the reading audience for whom they are intended will find acceptable. The company expects that its technical writers will be totally computer literate and use the latest hardware and software in performing their tasks.

Finally, to state the obvious, you must like to write! While this is certainly not a new idea, some people overlook it when choosing a career. The more skill you have with words, punctuation, and grammar, the more options you'll have to work in a variety of writ-

ing modes, and your chances for success also will be greater. It has long been known that writers who can prepare the most articulate oral and written presentations are better equipped for good jobs and for regular promotions than those who do not communicate well. Every report we have seen, every questionnaire filled out by technical communicators now holding important management positions, attests to this fact: the author knew how to write well, how to present proposals, and how to speak convincingly.

Problems Faced by Technical Writers

The phrase *media intake* implies that communication has at its disposal more media and channels of information than were conceived possible just a few short years ago. As with the scientist, more information reaches and is available to the writer than can be assimilated in a short period of time. This can frustrate a writer, who may feel inundated by this ever-increasing tidal wave of information. In this vein, the late President Kennedy is reported to have said, "I'm reading more and more and enjoying it less and less."

There isn't any simple or rational solution to this problem. Earlier in this chapter, you read that the most successful technical writer must necessarily become an eternal student. You will have to spend many hours reviewing mountains of information just to keep up to date. For example, consider the story of the Hollywood agent who was fired by an actor for failing to get him a choice role. The agent protested and proceeded to give the actor a long list of accomplishments on his behalf. The actor responded, "Yes, I know. But what have you done for me lately?" Unfortunately, this little vignette is true everywhere people work for others. So, to ensure your continued value and employability, you must stay current and

on top of things in this fast-moving world, where employees can be quickly replaced.

Because your technical writing career will include dealing heavily in human communications, you must maintain effective personal interaction. If you find yourself wondering why you aren't getting responses to your requests, why you are not receiving the same information other members of your staff are getting, or why some of your meanings are being distorted by your readers, then it might be time to reevaluate the way you are communicating. To minimize these problems, you must keep all lines of communication open, and your communication must be clear and active.

Other communication problems may arise between you and the people you work with and write for. Don't be surprised if scientists and engineers think and behave differently than you do and if they apply different meanings to words. This also may apply to your readers. You will be expected to adapt yourself to them because most of them won't change their ways for you.

Marshall Field, the great entrepreneur, once said, "The customer is always right. So, give the lady what she wants." Because of this, you must learn how to address your words and writing and to use language that is appropriate to your audience. All of these issues emphasize that the field of technical writing is an ever-evolving profession with ever-changing demands.

2

Training for Technical Writers

Every professional working in a technical field—from the electronics engineer designing a user's manual for a new product to the biologist writing an environmental impact report to the accountant explaining an auditing procedure to a client—must be able to communicate ideas effectively.

There are two main ways to become a technical writer. The most traditional way has been on-the-job training; however, the ideal situation in which you can learn this field is to major in technical communications in college. This will help you to not only learn to master the mechanics and techniques of writing, but to be well-grounded in science and technology as well. Not every college and university offers such a curriculum, but with the large number of schools throughout the United States and Canada that do, finding a program shouldn't be too difficult.

Most technical writers are graduates of four-year programs and have earned bachelor's degrees. Some have master's degrees gained

through specialized course work beyond their undergraduate study. However, a growing number of technical writers have graduated from two-year and community colleges.

It is, of course, possible to become a technical writer directly after high school graduation, as you saw in some of the job advertisements in Chapter 1. However, recent reports issued by the Society for Technical Communication show that the level of education for writers has risen considerably over the past two decades. Based on this information, you can see that most employers believe that someone fresh out of high school wouldn't have acquired the skills or experience necessary without further training to be successful at technical writing.

Background You'll Need

What constitutes good training? We have selected the views of two professionals whose years of experience in the field qualify them to address the educational needs of the prospective technical writer. Fred W. Holder, who has written a great deal about communication, has this to say.

> Ideally, a candidate should have a bachelor's degree in engineering (in the particular specialty with which you're dealing) and a master's degree in English, journalism, or another field requiring a sound background in written communication. . . . I've found that people with sixty to ninety credit hours of college work covering English, journalism, mathematics through calculus, physics, chemistry, and a wide range of other subjects make excellent technical writers.

Marguerite F. D'Amico, a director of technical communications for international corporations, expresses her views.

> There are three essential requirements for those involved in translating and presenting technical ideas: a solid foundation in the basic sciences and some understanding of how they relate to technology; an understanding of how to organize and present concepts clearly, logically, and graphically; and a sensitivity to the standards and needs of those receiving and supplying the information.

What does it all add up to? It simply means that technical writers will need more and more formal education as time goes on. In discussing technical writing education, some general principles apply.

Differences Between Technical Writing and Technical Editing

Most companies differentiate between technical writing and technical editing. Editing requires a person who is adept at improving the composition end of writing by correcting grammar and punctuation, style, and construction of sentences and paragraphs. Technical writing, on the other hand, encompasses the whole process. It takes in editing, of course, but it extends to original writing as well as the rewriting of other people's manuscripts. The writer must have a firm grasp of the technical material to cope with this kind of assignment.

For the rather restricted job of technical editing, it is generally agreed that solid training in English composition will serve you well. A prospective technical editor also should, of course, have an affinity for technological subjects and familiarity with engineering and scientific terms. For the writer who must deal in-depth with technical subjects, a firm foundation in science and engineering is essential.

It almost goes without saying that to work as either a technical writer or editor, you must be computer literate. In addition to using word processing programs to write, you'll need the ability to use a variety of databases and software programs for research and information storage and retrieval.

Courses in Technical Writing

Depending on the university, you will find courses in technical writing offered in many different departments, including English and other humanities-based departments, communications, journalism, business, the sciences, and engineering.

In recent years, colleges and other schools have recognized that engineering students, for example, should be taught not only English composition, but should also be exposed to courses in technical writing. These courses are usually taught by members of the English department in an engineering college or by teachers of engineering who have an interest in writing. They deal with special forms of technical writing such as report writing and the preparation of scientific papers and magazine articles.

As a result of the formation of various technical writing societies and the great need for technical writers, industry and the technical press have taken more interest in what is being taught by colleges. Every year the Institute of Electrical and Electronics Engineers (IEEE), with more than 370,000 members, holds a special session titled "Engineering Writing and Speech." During this session, seminars and panel discussions on the training of engineers are held to foster clearer and more informative written communications and to improve the relationships between engineers and technical writers. The result of this two-way process has been the introduction

of many fine technical writing courses and four-year programs into a number of colleges and universities.

In addition to technical writing courses, a considerable number of schools now offer majors in this specific discipline. The programs have various names and can be found in communication- or humanities-oriented departments under such course titles as science writing, science information, technical journalism, and technical communications.

Choosing the Right Program

There are two important things to consider when choosing an education program. First, you must determine which programs and courses are available; then you must decide whether they will provide the skills you'll need once you are employed.

We carried out a study of this very subject among a group of technical writers. These are the answers broken down into three categories:

What Are Your Present Duties?

Professional (preparation of):

- Computer manuals
- Hardware manuals
- Reports and proposals
- Audiovisuals
- Brochures
- Layout

Management:

- Writing
- Supervising
- Consulting

Production
Operations
Editorial management
Training programs

Publicity:
Writing technical articles
Placing technical articles
Preparing brochures
Preparing newsletters

Academic:
Teaching technical writing
Teaching media instruction
Teaching English composition

What Other Courses Should Be Included in the Curriculum in Addition to Technical Writing?
Science or engineering courses
Media courses using CDs and DVDs
Oral presentations

What Courses Should Be Taken Outside the Technical Writing Field?
Management administration
Sociology
Industrial psychology
Computer science
Graphic arts
Photography
Printing

You may be able to extract a couple of pointers from this information. First, decide what kind of technical communication job you are aiming for—writing or editing. Then you need to know what area you think you are qualified for, such as dealing with reports, manuals, papers and articles, publicity, or advertising. You must also think in terms of specialization, whether in computers, science, medical, or any of the other areas discussed in Chapter 1. Finally, you should find a college that meets your requirements.

Peterson's Guide to Four-Year Colleges lists many schools in the United States and Canada that offer B.S. degrees in technical writing. Enough information about entrance requirements and approximate cost is included to allow you to decide which schools you wish to contact for further information. You can visit www.petersons.com to search for programs and schools. Once you've found schools that interest you, visit their websites and request catalogs to learn about course descriptions and other important information.

Sample Programs

To illustrate the variety of programs available, we have randomly selected a number of schools and briefly outlined their technical writing programs. Notice the diversity of departments that offer degrees in technical writing.

Undergraduate Programs

Brigham Young University
English Department
Provo, UT 84602
http://english.byu.edu/emphasis/technicalcommunications

Students can pursue a B.S. in English with a technical communication emphasis. In addition to English courses, the department offers classes in technical writing, editing for publication, document design and portfolio, studies in language and rhetoric, and an academic internship.

Additional courses are available in computers and academic publishing, oral business communication, desktop publishing, electronic publishing, elementary computer applications, and magazine writing, editing, and publishing.

Capilano College
Communications Department
North Vancouver, BC V7J 3H5
http://capcollege.bc.ca/programs/cmns

In addition to a B.A. with a concentration in technical writing, the department offers a fifteen-credit certificate program in professional communications, which teaches generalist communication skills for business, communications industries, or the applied arts.

Graduates have the skills needed to plan and write correspondence, business and technical reports, proposals, promotional materials, Web content, speeches, presentations, and visual media materials.

Carnegie-Mellon University
English Department
Pittsburgh, PA 15213
http://english.cmu.edu

The program includes two tracks, one in technical communication and one in scientific and medical communication. Both begin with a core of foundation courses in print and online communica-

tion as well as a shared set of prerequisites in math, statistics, and computer programming; then they branch out to include appropriate specialized courses.

Students work on real projects for actual clients to learn group interaction and management skills. Students who maintain a B average in writing courses may participate in internships for academic credit during their junior or senior year. These internships provide a minimum of 120 hours of professional experience as well as exposure to the broad range of career possibilities that technical writers can pursue after graduation.

Colorado State University
Department of Journalism and Technical Journalism
Fort Collins, CO 80523
www.colostate.edu/dept/TJ

The program prepares students for careers working in newspapers, magazines, broadcast and electronic reporting, public relations and technical/specialized journalism, and computer-mediated communication. Students may choose from the following concentrations: computer-mediated communication, public relations, news/editorial, specialized and technical communication, and television news and video communication.

Embry-Riddle Aeronautical University
Department of Humanities and Communication
Prescott, AZ 86301
www.erau.edu/omni/pr/academicorgs/prdohc

Courses are offered in technical writing, business communication, professional communications, and informational literacy, among others. Courses are designed to support language, literacy,

and critical thinking skills needed both in courses offered by other departments and in advancing professional and personal growth.

Academic support is provided through the writing center. Students network with faculty in the College of Engineering and the College of Aviation to provide writing support across the curriculum. Opportunities also exist to network with professionals in business, industry, and government to keep abreast of their needs in language, literacy, and critical-thinking skills among potential employees.

Massachusetts Institute of Technology
Program in Writing and Humanistic Studies
Cambridge, MA 02139
http://web.mit.edu/humanistic/www

Program subjects are divided into four areas: exposition and rhetoric, creative writing, science writing, and technical communication. Introductory subjects in each area are designed for students with little writing experience; the advanced courses are for students who have mastered the basic elements of writing. The faculty includes novelists, essayists, poets, translators, biographers, historians, engineers, and scientists.

Students may also major in writing or develop a joint major with another discipline in the humanities or with the program in science, technology, and society.

Metropolitan State College
Department of Technical Communication and Media Production
Denver, CO 80217
www.mscd.edu/~techcom

The four areas of concentration in this department are corporate communication, multimedia production, technical media, and technical writing and editing. Students may also minor in technical communication or receive a certificate in technical writing and editing.

Michigan Technological University
Humanities Department (Scientific and Technical Communication)
Houghton, MI 49931
www.hu.mtu.edu

The program for a B.A. in scientific and technical communication requires forty-five hours in the core option, with courses in writing, editing, basics of photography, introduction to website design, publications and information management, engineering ethics, and usability and instructions writing.

University of Washington
Technical Communication Department
College of Engineering
Seattle, WA 98195
www.engr.washington.edu

The B.S. in technical communication program gives students a solid foundation in math and science coupled with strong communication skills. Students learn to design, write, edit, and evaluate technical and scientific materials and to gain an understanding of the rhetoric of technical discourse, public policy and technology, hypermedia and multimedia, publications management, and online support systems. There are more than twenty courses for students to choose from, including options for self-study and special proj-

ects, and many opportunities to work individually with faculty members.

Graduate Studies

The following is a sampling of colleges and universities that offer graduate programs in technical and scientific communication. Again, notice the range of departments offering graduate studies in this field.

Boise State University
College of Arts and Sciences
Boise, ID 83725
http://boisestate.edu/techcomm/ma.shtml

Students working toward the M.A. in technical communication study such disciplines as rhetoric and composition, linguistics, cognitive psychology, sociology, and gender studies as they apply to the theory of technical communication. They then progress through courses in writing, editing, oral communication, and ethics, followed by a course in visual rhetoric and information design and either a print or on-screen document production course. Students also complete a three-credit internship.

In addition, there are a number of elective courses, including Writing for the Computer Industry and courses in both print and on-screen document production covering topics of interest in desktop publishing, Web development, and online help authoring.

Boston University
Center for Science and Medical Journalism
College of Communication
Boston, MA 02215
www.bu.edu/com/jo/science.html

The M.S. degree, which is awarded by the college's journalism department, comprises forty-eight credit hours that are taken over three semesters. In addition to any required program courses, students may take electives throughout the College of Communication such as in screenwriting, literary journalism, or radio reporting. They may also take science courses in other departments or, under special arrangement, at other academic institutions in the Boston area.

During the summer between the second and third semesters, students participate in a professional internship that involves a journalism position at a newspaper, magazine, or radio or television station.

Illinois Institute of Technology
Department of Humanities
Chicago, IL 60616
http://grad.iit.edu/bulletin/programs/techcomm.html#department

The M.S. degree in technical communication and information design provides a thorough understanding of communication practices, familiarity with the information and communication technologies, and an awareness of and appreciation for the importance of collaboration in enhancing the flow of information throughout an organization.

Required courses include research and usability testing, online design, documentation and project management, entrepreneurship in technical communication, documentation design, technical editing, and an internship.

Elective courses include proposal and grant writing, indexing and information retrieval, language issues in international communication, intercultural communication, and computer-assisted instruction using multimedia.

Miami University
Department of English
Oxford, OH 45056
www.units.muohio.edu/english/Graduate/MA/matsc.html

The M.S. in technical and scientific communication prepares students to write, edit, or supervise the creation of instruction manuals, grant proposals, scientific research reports, or DVD presentations on technical subjects, to mention just a few possibilities.

The interdisciplinary program consists of eight required courses plus three electives. Also required is a one-semester internship in which students work as apprentice technical and scientific communicators in business and government. Students who are already working in the profession may perform the internship with their present employers; those with substantial professional experience may choose to write a thesis in lieu of the internship. Students in the program will prepare many of their assignments in the technical and scientific communication laboratory.

Rensselaer Polytechnic Institute
Department of Language, Literature, and Communication
Troy, NY 12180
www.llc.rpi.edu/programs/graduate_techcomm.shtml

Students enter the M.S. program in technical writing and communication with academic backgrounds ranging from education to engineering. Regardless of their academic backgrounds, students are required to take thirty credit hours beyond the bachelor's degree and can complete the course in one year of full-time study or several years of part-time study. Some of the courses included in this program are: Visual Communication, Film, and Fiction; Language:

The Cultural Milieu; Data Processing; Organizational Psychology; and Advertising Strategies and Promotion.

Applying to University Programs

When you decide on a school you'd like to attend, check to be sure that the program it offers meets your needs. In most cases, you can search the school's website to get extensive information about course offerings and admission requirements, or you can request a catalog from the admissions office.

If you are considering taking one or two courses without matriculating, determine whether you'll receive credits for any courses you complete. It's a good idea to accumulate credits, because they will count toward your major if you decide to pursue a degree. Find out whether any prerequisites are required; you may need to complete certain courses in English composition prior to taking the course.

In-Company Training

Although the shortest path to becoming a technical writer is by mapping out a clear-cut educational program, there is still another way, and that is through in-company training. Such programs will benefit you if you are an employee of the company and have had formal training but need to get actual writing experience.

In-company training programs for technical writers include a variety of practices. Some companies offer elaborate seminars that are taught by professional educators. Many of the nation's most progressive companies, large and small, offer such courses because they find that training programs are an effective way of keeping their

people alert and up to date. They are also a means of attracting good personnel to the company.

Technical writing training programs fit into several categories. One of these is the formal course offered at regular intervals on company time and run by a company employee who is or has been a technical writer. Some companies take a less formal approach by bringing in outside consultants. These consultants are likely to be teachers of technical writing, report writing, and technical composition who are known for their practical experience in the industry.

Society for Technical Communication

The Society for Technical Communication (STC) is a membership organization dedicated to advancing the arts and sciences of technical communication in the United States, Canada, and around the world. Its eighteen thousand members work in every aspect of communicating technical information and include technical writers and editors, content developers, documentation specialists, technical illustrators, instructional designers, academics, information architects, usability and human factors professionals, visual designers, Web designers and developers, and translators.

STC provides support to teachers and students of technical communication through programs, scholarships, grants and loans, annual conferences, and seminars. It also maintains a database at its website where students can search for programs throughout the world based on a number of criteria.

Web and Telephone Seminars

Participants in a Web and telephone seminar listen to the presenter over the phone (much like a conference call) while viewing pre-

sentation materials over the Web. This format provides easier access to materials for reference during the presentation. Registrants are provided with a toll-free number, a secure URL, and passwords to access both the audio and online elements of the presentation, which are followed by live question-and-answer discussions.

Student Competitions

To promote the study of technical communication among students, STC sponsors competitions for high school and college students. The International Student Technical Communication Competition (ISTCC) recognizes excellence in technical communication at the high school level. Each year cash awards are presented to students in one of the last three grade levels before college whose papers demonstrate outstanding technical writing skills.

Entries are judged by a panel of professional editors, writers, scientists, and educators. Judges evaluate the quality of each student's writing, clarity of the purpose, significance of the topic, effectiveness of the organization, and soundness of the conclusions. They also appraise the use and documentation of reference materials, as well as the use of visual and graphic aids.

The International Science and Engineering Fair (ISEF) Competition recognizes excellence in communicating technical information through posters and technical reports submitted by high school students as entries in the International Science and Engineering Fair. Students compete for scholarships, tuition grants, internships, and scientific field trips. The grand prize is a trip to Stockholm to attend the Nobel Prize ceremonies.

The International Technical Writing Competition is sponsored by the Phoenix Chapter of STC. It is an opportunity for college students to be recognized for outstanding writing in technical com-

munication. The competition is open to all STC student members around the world who are enrolled in college. A cash prize is awarded to the top paper, which may be published in STC newsletters around the world.

Honorary Fraternities

Sigma Tau Chi (STX) and Alpha Sigma (AS) are honorary fraternities of the Society for Technical Communication. They recognize students enrolled in a technical communication program who have a cumulative grade point average of 3.5 or above, are exemplary in participation in STC, and demonstrate a potential for significant contribution to the profession. Sigma Tau Chi recognizes students in baccalaureate and graduate progams; Alpha Sigma recognizes students in two-year and certificate programs.

Additional Training Options

There are other education options aside from the traditional undergraduate and graduate university programs.

Short-Term Courses

An outgrowth of education in the technical writing field has been a number of special institutes, seminars, and workshops. They provide short-term means of bringing technical writers up to date on current practices. For the most part, these institutes, especially those run by private institutions, appeal to already established writers. However, they are also valuable to new writers who want to find out what technical writing is all about, meet other writers, and make useful contacts.

It isn't possible to list all of the options in this book, but a search at www.Petersons.com will lead you to these schools.

Online Programs

Online services such as AOL offer short-term courses covering technical writing and business and academic communications. Some courses have live sessions held in online classrooms; others are conducted via e-mail. Instructors are all professional writers and instructors who work closely with students. Courses run from four to twelve weeks.

A twelve-week program in professional technical writing is offered by Online-Learning.com. Mentored courses allow students to work on their own with support and feedback from instructors. Students communicate with instructors and other students through e-mail, discussion boards, and audio and text chat sessions. A thorough search of the Internet will lead you to even more options.

Words of Advice

As a future technical writer, whether you are just starting your training or are planning to enter from another field, you should think in these terms:

- Be sure to take enough science courses compatible with the area of technical writing in which you are interested, whether it is chemistry, physics, electronics, mathematics, computer science, or engineering.
- If you are still in high school, take all available writing and composition courses. Although courses in creative writing are fine for some forms of professional writing, it is important that your

curriculum include courses in science and technology. If you are already familiar with the subject matter of science and engineering and join a company as a technical writer, you have an advantage over the graduate who is not trained in science.

- If you have already graduated from high school and cannot plan on the four years required to earn a bachelor's degree, see what courses are offered by two-year community colleges or adult education programs in your area, or investigate some of the additional training options discussed above.
- If you aren't able to find a definite technical writing program in your own college, consider creating your own program by majoring in a science and taking writing courses and elective subjects such as mathematics, economics, and statistics.
- If you have already graduated from college, consider pursuing a master's degree. As with your undergraduate studies, you may find a defined graduate program in technical writing, or you may design one yourself with a technical writing career in mind.
- You might also consider the various journalism programs available that have options in technical writing. They will give you good training for a career in the technical and scientific press.
- Gaps in your training can be filled in by extension courses, taken either during the day or the evening, and by correspondence and online programs.

If you choose the last option, be sure that the institution offering the course is well established, that it is properly licensed, and that it operates under proper state and federal regulations. A potential employer must have confidence in the sources from which you have received your education, so it is worthwhile to check the accreditation, reputation, and longevity of any correspondence

school you are considering. Ask your career counselor or other school administrator for guidance.

Education Costs

The cost of obtaining a degree in technical communication, as with other professions, depends on the kind of school you attend and where it is located. Liberal arts colleges tend to have lower tuition than colleges of engineering and science. State universities and community colleges are less expensive than private schools, more so if you are a resident of that state.

Graduate education is run somewhat differently from undergraduate education. The principal difference lies in the fact that a great many students can afford to go to graduate school only with financial aid, such as tuition scholarships and fellowships offered by colleges and industries. A scholarship provides tuition only; a fellowship usually contains a modest living allowance as well as the stipend for tuition. In addition, there are assistantships for which the graduate student is assigned to a particular department to teach undergraduate classes, correct papers, or assist in laboratories. Sometimes, to fulfill these assignments, the student is not permitted to take a full academic load, which means that it will take longer than two or three semesters to complete a master's program and may take twice as long. Under these circumstances, it is impossible to know in advance exactly how much the program will cost.

Costs of education vary from year to year and are affected by the amount of financial aid available in the form of state scholarships, fellowships, and assistantships. In addition, part-time work in writing and editing may be available on campus, especially to technical writing and journalism students.

Scholarships, Fellowships, and Internships

You will find a variety of financial aid sources available at colleges and universities. The following is not a complete list, but it will give you some idea of where to apply for assistance.

Several professional associations offer scholarships through their education programs. For example, the Society for Technical Communication awards scholarships to students enrolled in technical communication programs at universities, colleges, junior colleges, and technical schools. See the appendix for the contact information of numerous organizations that might provide financial assistance.

It's also a good idea to check with community groups to see whether any offer scholarships. Rotary International and the Elks Club are just two organizations that offer scholarships. In addition, some unions offer scholarships and financial aid opportunities for children of members. Be sure to investigate all the options while making your plans.

3

Getting Started

In Chapter 4 you will read about the actual work technical writers do, who hires them, and the types of places at which they work. But first, let's get an overview of the employment outlook in technical writing and some tips on landing the job of your choice.

Employment Outlook

The employment outlook for technical writers is good; in fact, it is the most promising of all writing professions. Several factors have contributed to the strength of this field.

One of these is that the well-trained technical writer is at the forefront of new and groundbreaking techniques. If you are a student, prepare yourself for this career by getting a solid background in the sciences, particularly in computer science. With this foundation, you should be able to fill the needs of industrial and government employers.

Another factor is that the well-trained writer can bridge the gap between technical subjects and nontechnical readers. One thing is certain—at some point, everyone must learn something about technology, even if only to use an appliance by reading an appliance user manual. The general public buys the products and services that technology makes possible, but it is the technical writer who informs and persuades the public through reports, manuals, news releases, articles, and advertising. This need for reader-friendly materials that can be easily understood and followed by the nontechnical public will keep technical writers in demand.

According to the U.S. Bureau of Labor Statistics, employment for all kinds of writers and editors is expected to increase between 9 and 17 percent through 2014, with technical writers leading the pack in employment growth. Employment of salaried writers and editors for newspapers, periodicals, book publishers, and nonprofit organizations is expected to increase as demand for these publications grows, particularly in the online environment. Magazines and other periodicals increasingly are developing market niches, appealing to readers with special interests. Businesses and organizations are developing newsletters and websites, and more companies are experimenting with publishing materials directly on the Internet. Online publications and services are growing in number and sophistication, spurring the demand for writers and editors, especially those with Web experience. Advertising and public relations agencies, which also are growing, should be another source of new jobs.

Opportunities should be best for technical writers and those with training in a specialized field. Demand for technical writers and writers with expertise in areas such as law, medicine, or economics is expected to increase because of the continuing expansion of scientific and technical information and the need to communi-

cate it to others. Legal, scientific, and technological developments and discoveries generate demand for people to interpret technical information for a more general audience. Rapid growth and change in the high-technology and electronics industries result in a greater need for people to write users' guides, instruction manuals, and training materials. This work requires people who not only are technically skilled as writers but also are familiar with the subject area.

In addition to job openings created by employment growth, some openings will arise as experienced workers retire, transfer to other occupations, or leave the labor force. Replacement needs are relatively high in this occupation; many freelancers leave because they cannot earn enough money.

Researching the Field

Technical writing is a highly specialized profession requiring a combination of technical training and competence in communication. As part of your career preparation, you should begin to consider employment opportunities long before you graduate from college.

You can find a considerable amount of information about how to get started in technical writing from a number of sources, including ads in newspapers and journals, brochures prepared by professional societies, professional websites, and books. If you are seriously thinking about becoming a technical writer, you can take a number of steps that will help you obtain professional guidance and information.

- Explore the education portion of the website of the Society for Technical Communication. STC provides support to teachers and students of technical communication through programs, schol-

arships, grants and loans, annual conferences, and seminars as well as a database of academic programs worldwide. Contact information for the STC is given in the appendix.

• If you are still in high school, make an appointment with your guidance counselor to discuss the profession of technical writing. A lot depends on whether you are planning to continue your education by going to college or taking other specialized training courses. In either case, counselors should be able to guide you to resources about technical writing careers or tell you where it can be obtained.

Don't be shy about talking to professionals working in the field or professors of technical writing. Contact your local college and ask to set up an appointment with a professor who also serves as a student advisor. This type of information-gathering session will help make sure you're on the right track with your career choice.

• If you are in college, talk with the official in charge of the placement office. Job placement is a service provided by almost every institution these days. Throughout the year, college placement officers are in contact with the human resources managers of companies and other organizations that are looking for people to fill important technical writing jobs.

But don't depend entirely on the college placement office. There are many excellent teachers working in technical communications. If your school has a technical writing program, talk with the person who teaches it. Nine times out of ten, this instructor will have good contacts with business and industrial firms. Contacts of this kind are probably the most valuable way of getting started in the profession.

• Job contacts also can be established by directly contacting the supervisors and administrators of the publications departments of companies. To establish these contacts, read the large industrial ads

for technical writers in the newspapers, as well as those published on the Web, especially those in highly developed industrial areas. If you can't find a specific name to send your inquiry to, send it to the director of publications. In time, your letter will filter through to the right person, and you will be able to set up an informational interview, which could possibly lead to a job contact or a full-time job.

• Surf the Web for ideas. Websites and databases are updated on a regular basis. The following are agency and organization websites that will help make your job search a bit easier.

The Computer Merchant Ltd.
www.tcml.com

Documentation Strategies, Inc.
www.docstrats.com

Essential Data Corp.
www.essentialdata.com

PVA Global
www.pvaglobal.com

STC Career Center
http://jobs.stc.org/home

Researching the Jobs

If you would like to enter the industrial world, or any other occupation for that matter, you should do some groundwork. First assess what you have to offer, and then do some research into the company in which you are interested to see whether you can meet its requirements.

You can do much of your own research. Remember that certain kinds of companies, such as chemical, electronic, and aeronautical industries; contracting companies; research institutes; and government agencies are more in need of technical writers than others.

Most libraries have a copy of *Standard and Poor's Index*. This reference book lists a great deal of information about major companies, such as where they are located, what they manufacture, divisions in the company, and branches in various cities and countries. You can also visit its website at www.standardandpoors.com for information.

There are other helpful books and publications that you can consult for valuable career information. Plan to spend some time in your local public library, university library, or a community college library getting the information you need.

As mentioned earlier, the Society of Technical Writers maintains a database of job openings. Other sites do, too. See the appendix for a list of professional societies.

Don't forget about Internet job sites. Both Monster.com and Careerbuilder.com are examples of sites that allow you to post a résumé, search for jobs, and even get help in preparing your résumé and conducting your job search.

Sample Job Titles

Here are some job and title samples taken from ads in various professional journals.

- Editor for consumer electronics
- Senior editor for trade magazine
- Editor for medical journals; monographs on clinical medicine

- Editor, nursing journal
- Editor/writer to report on technology in robotics field
- Editor/writer for medical journal
- Business writer for management consulting firm
- Editor to coordinate production of proposals for computer services
- Experienced writer of government proposals
- Newsletter editor for part-time work in university for space research group

The Career Center of the STC website is a tremendous resource for anyone seeking a position in this field. Society members can post résumés, view job listings, and create a personal job alert and a career account to track their job search.

Letters of Application

Once you have the name of a potential employer, you are ready to write a letter of application with which you will include a résumé of your accomplishments. There are various ways to write this letter, which is also called a cover letter, but regardless of the format you use, certain points should be followed.

The application letter should be short, but it should include pertinent information about your background and the type of position you are seeking. If you are sending the letter in response to a specific ad, mention the date, publication or website, and job title. If a mutual friend or professional contact has suggested that you contact the company, you should mention it. Strive for a tone of enthusiasm, knowledge of the requirements of the company to which you are applying, and adequate training, all of which will catch the eye of the recipient.

Your application letter will be accompanied by a résumé, but it is best not to mention the attached résumé until the end of the letter. If you point it out too soon, the reader of your cover letter will turn to the résumé before finishing what it is you have to say about yourself.

Résumés

Preparing a résumé falls outside the scope of this book, but there are many resources you can consult on résumé writing and formatting. The Recommended Reading section at the end of the book includes some titles that can help you choose the best format and style.

Whichever type of résumé you decide to prepare, remember that, like your cover letter, it must be perfect. You can't proofread either document too many times, especially since you are applying for a writing position. A sloppy presentation or poor writing will not convince employers that you're the technical writer they are seeking.

Be sure to submit your letter and résumé in the format requested. For example, if an employer requests electronic résumés, don't mail a hard copy instead. Following that initial instruction is important, so be prepared to submit your credentials as requested.

Salaries

According to the Society for Technical Communication, the median annual salary for entry-level technical writers was $42,500 in 2004. The median annual salary for midlevel nonsupervisory technical writers was $51,500, and for those in senior nonsupervisory positions, $66,000.

The U.S. Bureau of Labor Statistics reports that during the same period, median annual earnings for salaried technical writers were $53,490. The majority earned between $41,440 and $68,980, while the lowest 10 percent earned less than $32,490, and the highest 10 percent earned more than $86,780.

As you are looking at salaries, remember that certain basic principles do apply:

- Graduating with a bachelor's or master's degree in engineering or science can help you to command a higher beginning salary than a degree in English or some other nontechnical subject.
- A degree from certain prestigious colleges also usually adds to your marketability and may bring a higher salary than a degree from a lesser-known school.
- The higher your course grades, the more summer experience you've had, and the more you can display characteristics of ability and initiative, the higher your salary is likely to be.
- With a degree in an area such as electrical engineering and electronics, you may be in greater demand than students with training in other areas.
- As a beginning technical writer, you will most likely be evaluated very closely on the basis of your educational record, writing ability, and potential for being promoted.

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4

Duties of the Technical Writer

With a degree in technical writing, you will be qualified to pursue any one of the career paths listed in Chapter 1, but some specializations seem to offer greater opportunities than others. In this chapter we examine the different specializations and the opportunities they present.

Technical Presses

Technical journalism surrounds us; in fact, the number of publications, periodicals, magazines, trade journals, and newspapers is so great that we take their existence for granted and hardly notice their presence. There are so many scientific and trade publications that it is impossible to cite a number with which everyone will agree. In addition, new publications are constantly appearing.

Scientific Journals

The text and subject matter of these publications range in complexity from the highly scientific *Journal of Organic Chemistry* to the very simplistic magazine *Popular Mechanics*. The *Journal of Organic Chemistry* is found only on the bookshelves of chemistry and technical libraries and in the offices of chemists. Naturally, most of its readers are organic chemists, and it is not generally available to the public at large. Similar journals would be the *American Journal of Physiology*, the *Journal of the American Medical Association*, the *New England Journal of Medicine*, *Chemical Engineering*, *Brain Research*, and many others.

The articles published in scientific journals are generally written by the scientists who are involved with the work. In most cases, the articles present the findings of extensive research projects. The authors' names appear directly under the titles, followed by the institutions with which they are affiliated. In academic institutions, papers presented for publication often are written by the graduate students who actually did the work, while the professors in charge provide guidance and lend their names to the final publication. Sometimes, professors who did their own research hire or supervise graduate students to do the actual writing, although the students in this case would remain anonymous. In industrial concerns, the preparation of papers is usually done by technical writers to enable the authors to engage in "more productive work."

Papers presented to scientific journals for publication undergo a process called *peer review*. After the paper has been submitted to a journal, the managing editor sends copies to recognized authorities in the field who carefully examine the paper for originality of work, correctness of experimental procedures, and validity of the claims. Very few manuscripts are accepted after an initial review. In the

majority of cases, the paper is returned to the authors for revision, based on the constructive comments of the reviewers. If the reviewers have major objections to the paper, they recommend rejection and state the reasons for their decision, telling the authors what they must do to satisfy the objections. The majority of authors will comply with the reviewers' comments and do additional work to make the paper acceptable for publication. If a paper has been rejected by one journal, it is not acceptable for the authors to present it to a different journal without disclosing the first rejection. It is not unusual for a paper to be presented and rejected several times before it is finally published. This process reduces plagiarism and fraud and ensures scientific integrity.

Scientific journals are vitally important to the community they serve. They allow the dissemination of valuable information and research results that can aid other scientists in their own work. In addition, researchers whose work is funded by grants are obligated to write up and submit the results of their work, and the number of accepted papers serves as a strong recommendation when the scientist applies for future funding. The same is generally true for those employed by academic institutions, where promotions and tenure can be influenced by the number of an applicant's publications. "Publish or perish" is a popular expression in both settings.

Trade Magazines

There are many scientific and technical magazines that are sold to the general public. These include *Scientific American*, *Science*, *PC World*, *Psychology Today*, *Popular Science*, and the aforementioned *Popular Mechanics*. The first two magazines often contain articles every bit as sophisticated and mathematical in content as those published by scientific and medical associations. Magazines like *Popu-*

lar Science and *Popular Mechanics* are intended for people who may know little about science or technology but who are interested in these subjects. The writers for these magazines must be able to interpret and present scientific material in such a way as to make it understandable and attractive to their lay readers. The success and longevity of these magazines speak for themselves.

Company Magazines

Your first job as a technical writer may be with a company magazine, such as Raytheon's *Technology Today*, which highlights the company's technological projects. Sometimes the table of contents contains a wide variety of articles on technology. At other times, an issue is devoted to discussing a particular field in depth. In either case, you would probably be writing some articles of your own or editing other people's articles.

The primary reason engineers and scientists write articles is to communicate knowledge. They may be engaged in research, may have developed a new technique, or may have been called on to publicize something for their companies. There is also the prestige factor—the author's professional reputation is enhanced when his or her articles are accepted and published.

In working on a company magazine, you will be helping others prepare their articles. Most of these magazines consist of three departments: editorial, advertising, and production. As a writer, you will be assigned to the editorial department, but if you should demonstrate advertising or production ability, you may be able to transfer to these departments.

One of the best features of working for company magazines is that they are likely to operate with small staffs on a fairly informal basis. This often results in interesting working conditions, and you

may find yourself doing a variety of things, such as writing original articles, editing articles written by others, editorializing, and carrying out special assignments.

Sometimes a company magazine can be published by only one or two people working with a printing firm and outside advertising staff, or it may be produced in-house using computers and laser printers. It can have a much larger staff, including editors, proofreaders, copyreaders, illustrators, office support staff, and an editorial board.

Working on a company magazine will bring you in contact with many people, which will require patience and tact on your part. In the first place, you must persuade the engineers and scientists to write for you, and they can be very busy people who often are not particularly interested in whether they get published.

Most editorial boards start preparing an issue of a magazine by having a "think session." From this starting point, many of the things said about company magazines can be equally applied to commercial technical magazines.

A think session occurs when the magazine's staff gets together to decide what will go into a particular issue. And you may be surprised to learn that magazines work six, seven, or eight months in advance. It takes weeks and weeks to produce an issue, from the idea for the first article until the magazine is wrapped up and sent to the mailroom.

One of the most fruitful sources for papers and articles is conferences attended by company employees. Papers delivered at these gatherings often turn up as magazine articles. But such selection is planned with several factors in mind. The editor may decide to consult the public relations department to determine what is going on in the company that will appeal to readers. In addition, manage-

ment must be consulted, because in the long run, responsibility for the magazine rests with the company's administrators.

Once you have received a manuscript from an author, the real job of writing and editing begins. This is when the experience you have gained in your writing classes will come into play. Although the people from whom you get the material may (or may not) know how to write, it is very likely that they haven't paid attention to their potential readers. So determining the audience becomes your job, and you must fit the style and tone of the piece to the audience you are trying to interest. For example, you may have to write a completely new opening for an engineer's paper to attract readers' attention. Here is where your job is perhaps most satisfying—and sometimes most frustrating—as you try to weld unorganized material into acceptable form. Changes of any sort, of course, necessitate conferences with the author, who must be as satisfied with the final product as you are.

The manuscript must be reviewed to be sure it fits the prescribed editorial format. It is then turned over to the appropriate staff members for illustration and layout.

Professional Magazines

Professional magazines are published by professional societies. Some examples of these are the *Journal of Chemical Education*, published by the American Chemical Society; *Civil Engineering*, by the American Society of Civil Engineers; and the *American Journal of Nursing*, by the American Nurses Association.

A great many journals are read by audiences outside of the company. For this reason, a technical journalist must be able to gauge the interest and needs of these external readers and to produce material that is "reader friendly." The ability to analyze these

readers becomes of paramount importance. If you think that you have this ability, together with imagination and proper motivation, technical journalism may be your career goal.

In general, the technical press—magazines, journals, and publishing houses—employs fewer writers than other areas. However, interest in this field is increasing as publishers realize that second-best writing on technical subjects is not enough, and that in a highly competitive field, they must employ technically trained writers.

One professional in the field has noted that an increasing number of journalistic jobs are open to engineers and scientists. Some of these opportunities include science reporting for newspapers; professional and trade journal writing and editing; technical and industrial publicity work; science writing for radio and television; and freelance technical writing.

This increase reflects a growing interest in engineering and scientific news at both the lay and technical levels. Advertisers also have realized the potential in the technical advertising field, which makes the technical writer almost indispensable. The same thing is true of technical publicity, as advertising agencies are trying to locate technically trained writers or engineers with a flair for writing.

Promotional Writing

Advertising brochures, pamphlets, and catalogs are published and distributed by companies to sell their products and to attract new customers. The job of a technical advertising copywriter is closely related to that of a promotional and publicity writer. The technical writer who works in this area is usually employed by an independent advertising agency whose clients are companies that need outside help in advertising their products.

An example of this type of writing is the literature that pharmaceutical salespeople give to physicians along with free samples of their companies' products. Similarly, salespeople for agricultural companies visit farmers with advertising material to induce them to use their seeds, fertilizers, pesticides, herbicides, animal feeds, and farm implements. Although this promotional material does contain a lot of factual, reliable data and information, it must, nevertheless, be classified as self-serving.

Many technical writers prepare sales or promotional literature for a variety of merchandise such as automobiles, home appliances, and consumer electronics goods. Brochures are printed by the manufacturer for potential customers, and these brochures contain lots of technical data about the products that customers are considering buying. The brochure also will contain other information describing the products' virtues and attractiveness. This is best illustrated by what happens when you visit an automobile showroom to buy a new car—not only does the salesperson describe the merits of the car you are interested in, but he or she also hands you a very attractive brochure that describes its engineering, performance, safety, and appearance features. The salesperson then points out certain items in the brochure, hoping to make the car purchase irresistible to you.

Technical sales literature comes in many forms. In addition to the auto brochure described above, it could be a pamphlet describing the construction of a turbine for a government project. Or it could be information for a new product soon to be released to the industrial market. The publicity department of a company may handle all of these activities—preparing news releases for trade journals, newspapers, and magazines as well as brochures to be sent to potential customers. These written items usually combine sales appeal and technical information.

The procedure for preparing a sales brochure is about the same as for other pieces of technical writing. First the project itself must be authorized, in this case, by management. Then a number of things take place, sometimes concurrently.

You will first collect all the information about the product or equipment that you possibly can. To become totally familiar with the background of the project, you may have some earlier publications to serve as guides. You will visit the departments responsible for the design, construction, and manufacturing of the product to get its views on the consumer, the kind of company it is, and anything else that will help the booklet put across its message.

To work on sales literature, you must be aware of how much money can be spent on the brochure and how many copies are going to be distributed. These two factors will sometimes determine whether the brochure is to be printed by the publications department or given to an outside printer.

You will then design the brochure, working in close cooperation with a designer. This is where this kind of publication differs from some others. In sales literature, the layout of the brochure is extremely important, involving questions of shape, size, color, and illustrations.

The copy in an advertising brochure is frequently subordinate to the illustrations, and the writer must decide how much copy to write to support the illustrations. At this point the actual writing of copy begins, followed by checking and revising and all the other stages that go into any industrial writing.

Technical Advertising

Manufacturers of machines, instruments, and other industrial products spend millions on another kind of promotion—technical adver-

tising. Sargent-Welch, a supplier of science education equipment and apparatuses, placed this ad in an issue of *R & D* magazine.

> A Pump for Every Vacuum Range: You've got the vacuum requirements—we've got the pumps. Pick your own range and there's a Sargent-Welch pump right there ready to go to work—from the famous Duo-Seal oil-seated rotary vane pump line to the ultra-high, ultra-clean vacuum Turbomotor line of turbo-molecular pumps with capabilities to 1,600 liters per second. Or maybe one of our New Director direct drive pumps will fit your application better.

What we have given you is only the copy, or description, written by a technical writer either in the company's advertising department or in an agency hired by the company. The ad also features illustrations, various kinds of type, and other attention-getting devices.

It should be apparent that to write copy for technical advertising you must know something about the technical part of the product. You also should know enough about graphics, illustrations, and charts to give directions to the printer. And you should have some familiarity with composition, how various items are positioned on the page.

So, as a technical writer in advertising, you may work in the advertising department of a company or you may get a job with an outside agency specializing in technical advertising. In either case, your job duties and projects will be similar. One private advertising agency lists the following specialties.

- Market research
- Program planning
- Publication advertising
- Direct mail advertising

- Publicity
- Technical literature
- Merchandising aids
- Power Point presentations

As a writer of technical advertising, you may be involved in institutional advertising, for example, by writing general copy that creates a favorable image of the company in the public mind. New products must be advertised or the marketing of old products changed to such an extent that they seem new. The advertiser also may call attention to the service and maintenance offered by the company.

Robert D. Towne, an advertising executive, has outlined some points that help to explain the duties of the technical advertiser, as summarized here.

- Advertising writing is different from other kinds of writing because it is persuasive. In other words, even though information is at the heart of advertising, its main purpose is to persuade people to buy a product or a service or to have a problem solved. To many writers, this offers an interesting switch from the usual technical writing.
- The technical copywriter must think not only in terms of writing, but also in terms of two other factors: the sales idea and illustration. These will bring the writer in close contact with the sales force of a company and provide the stimulating experience of working with fine illustrators.

Technical advertisers also have their think sessions, as ideas are tossed around for review and the objectives of the advertising campaign are discussed. Dozens of ideas will be looked at and dis-

carded, but somewhere will be the one that will please most everyone, especially the client.

News Releases

Another kind of technical promotion is the news release, which may be in the form of a news story or an article for a magazine or website. The real reason for preparing a news release is to supply information (and advertising) that editors will want to include in their publications. It must be carefully written to present the information clearly and concisely, with language chosen to interest and impress the editors to whom it is submitted.

The technical writer often gets involved in news releases, operating from either a regular publications office or an advertising department. The considerable skill involved in preparing news releases is acknowledged by one editor, who points out that the presentation to the editor is as important as the news contained in the release. The most successful news releases are those that are run in the greatest number of beneficial spots.

If you work in this area, you must ensure the consistent acceptance of your news releases. You can do this by knowing the interests of the particular editors and of the magazines' readers; by preparing valid, newsworthy releases; and by submitting the releases in the proper, easy-to-use format that facilitates their use.

For individual readers, the news release often comes in another form called *new product information*. This variation must be short and to the point, demonstrating confidence in the product, describing it briefly, and requiring a minimum amount of space. Here is an example of new product information.

> This Hand-Held Anemometer will easily measure air speed wherever your hand can reach. The accurate hand-held one-piece unit weighs only three ounces and requires no external probe. Running on sapphire bearings, its freely turning turbine will rotate at a speed directly proportional to wind speed. The rotation is passively sensed by an infrared light beam, which adds no friction. An integrated circuit even converts the signal to your choice of units (feet per minute, mph, meters per second, or knots) and feeds it to a three-digit LED display. This cleverly designed instrument, which operates with three AAA batteries, measures 4½ by 4½ by 1⅛ inches.

It has been estimated that daily newspapers receive from 25 to 250 news releases a day and that approximately one of every 25 is used. As you can see, dealing with news releases requires special skills, and many of them were learned on the job.

Public Relations

As a member of a company's public relations department, you may be asked to determine what customers think of the company's products. Working with others in your department, you can expect to be given the assignment of planning a sales promotion campaign not only to maintain the loyalty of your customers but also to win over the affections and dollars of your competitors' clients. Here are a few examples of some representative projects.

- Developing brochures, press releases, and other materials that explain technical products and processes
- Preparing feature articles for trade and technical magazines that describe new technologies

- Writing speeches and presentations that will be delivered by organization executives at various meetings
- Preparing the company's annual report
- Developing audiovisual presentations
- Preparing position and technical papers for presentation to governmental agencies

Today's corporate managers and executives seldom have time to get involved in the actual work of speech writing and preparation details. They will decide on the theme and the main topics to be stressed, and they may offer guidelines as to how they wish to present and embellish their speech. But the rest is up to the publicity department to "give the boss what he wants." If the speech is deemed important enough, outside resources and assistance may be enlisted for the preparation.

Instruction Manuals

Publications departments engaged in producing manuals and instruction books show the most expansion and turnover of personnel for technical writers. You will find that when you apply for a job, the greatest response will come from employers needing technical writers who specialize in either manuals or research reports.

The need to transform masses of data into structured, intelligible information has created the ever-growing information industry. Without any identifiable plants, buildings, offices, or factories, the information industry exists in myriad companies, governmental agencies, laboratories, colleges, and universities in the form of individuals and departments whose sole function is to produce objective, understandable information for laypeople, regardless of the subject at hand. Consequently, technical writing is not limited to

topics connected with science, technology, and engineering. The ability of technical writers to convert raw data into usable information has received widespread recognition as a special skill and a talent. Companies that must sell the products they manufacture realize the importance of having technical writers on staff, and service organizations likewise must inform the public about their activities to sell what they have to offer.

A table of contents of a typical industrial manual that accompanies every manufactured item usually includes a general description; a theory of operation; instruction on installation, adjustment, and operation; and finally several drawings of the item. An instruction manual must be prepared to tell the customer how to install and operate the product safely and often includes troubleshooting suggestions.

The people who prepare these manuals are among the most skilled in the technical writing profession. To work in this area, you must be thoroughly familiar with the equipment and must write in a clear, concise, simple, and unequivocal manner for those installers and operators who may have a limited education and vocabulary or even limited knowledge of English. It is ultimately your responsibility to oversee the manual from inception to final pages for printing. Approximately one-third of all those who are employed as technical writers work exclusively on instruction and maintenance manuals.

Even before an instruction book can be started, a number of steps must be considered and the duties of each staff member must be well defined.

1. When a new instruction book has been authorized, the manager reviews what is required, issues a project work order, and assigns various people to work on it.

2. The writer prepares a preliminary outline of the instruction book based on predetermined specifications. This will include not only what must be written, but also a proposed list of illustrations.

3. The manager calls a conference, which includes the writer, illustrator, copyeditor, production editor, and, if possible, the project engineer.

4. All of these people consider the following: scope and contents of the outline, date on which the equipment the instruction book is supporting must be delivered, where the instruction book fits into the overall schedule for all publications, existing workload in the department, amount of work required to complete the instruction book, time required to have it printed and reproduced, and the deadline date for each section of the book.

5. The manager informs the person or department that originally ordered the instruction book when it can be delivered.

6. The production editor draws up a schedule for the work to show how the various staff members will contribute to it.

Who are the staff members we have been mentioning? The production editor is in charge overall and sees that the particular instruction book is worked on, completed, and delivered on schedule. The technical editor, or copyeditor, edits the written part of the instruction book and, in general, reviews it for style, accuracy of expression, grammar, and punctuation. The product engineer is in direct charge of the device or system for which the instruction book is intended.

Following are the procedures that the writer may follow when handed an assignment to put an instruction book together.

1. Collect and study available production drawings (schematics, wiring, and assembly diagrams). Obtain related written informa-

tion already in existence (development reports, test procedures, and instruction books on similar equipment). If possible, obtain the equipment for further study.

2. Meet with the project engineer and other responsible personnel to obtain additional data.

3. Based on information from steps 1 and 2, review the preliminary outline and list of illustrations. Revise this preliminary outline to make a working outline.

4. Deliver the list of required illustrations to the illustration section and discuss how they will be produced.

5. Begin writing the instruction book. During the writing procedure, prepare sketches, revise existing production drawings, and describe requirements for illustrations. Identify illustrations by figure number and title and forward them to the appropriate illustration section.

6. As writing continues, check the illustrator's rough drawings.

7. Make arrangements with the photography section for necessary photographs.

8. Review the completed draft. Edit the copy for technical accuracy, format, content, and correct references to illustrations and paragraphs.

9. Submit corrected draft to the editorial section for preliminary review.

10. Following conferences with the copyeditor, prepare final draft and forward it to the editorial section.

11. After receiving the reviewers' copies of the final draft, check and incorporate reviewers' comments into the master copy.

12. Review the manuscript completely, rechecking all illustration and paragraph references, format, and paragraphing for technical accuracy.

13. Send the completed manuscript to the editorial section.

14. When galley proofs have been received from the printer, review carefully, correct, and forward the corrected galleys to the editorial section. The importance of careful proofreading cannot be overemphasized.

In any publications department that prepares instruction books, the writer is involved in the following four phases.

1. **Research.** The writer analyzes the requirements of the project, collects the preliminary data, examines and interprets the data, and prepares the outline.
2. **Development.** In the development stage, the outline prepared in the research stage is used by the writer as a guide in writing the text and in determining the illustration requirements of the first draft.
3. **Prototype.** The research and development stages produce a prototype or model of the instruction book.
4. **Production.** In the production stage, all effort is concentrated on mechanically producing the book.

These, then, are the specific duties of the manuals writer; but in terms of procedures, they are fairly representative of any kind of job the technical writer may tackle.

Proposals

Writing proposals is very important to most manufacturing companies. In general, a contract usually precedes the start of any manufacturing operation. The contract may be between the company

and a government agency, between the manufacturer and a supplier of parts and materials, or between the manufacturer and the company that is buying the finished product. A contract proposal is prepared in which the product and the standards to which it is supposed to adhere are submitted to the purchaser. The two parties to the contract then work out the final purchase terms. Contract proposals probably rank next in number to reports and manuals.

Government agencies, frequently branches of the military, as well as private industries and foundations regularly solicit proposals from suitable companies to conduct research on a particular problem or to design a mechanism or facility. These requests for proposals (RFPs) may involve anything from investigating the socioeconomic impact of a new manufacturing facility through developing new traffic control patterns. They may even involve the design and manufacture of new military equipment.

Companies responding to RFPs must design proposals, often several volumes long, which convince the government agency or industry that their company's suggested research project or design best fits their requirements and is worthy of funding. Often these proposals must be submitted within a short time after receipt of their request, so expertise in proposal writing is essential.

Proposals may seek funding in the millions of dollars. A company's success and its continued existence depend upon having its proposals accepted and funded. Without funded projects, there is no new business and no reason for the organization to continue to exist. Academic research units are in much the same position: without funding obtained through proposals, they cannot continue their work.

In all companies involved with proposal preparation, the technical writer serves a crucial function, and the ability to write concrete, persuasive proposals within tight deadlines is a highly marketable skill. Later, of course, these same writers may be involved in the preparation of the report and impact statements growing out of the research projects.

Regardless of the type of proposal involved, it is a vital element in all companies, large or small, in government agencies, and in universities. So, when you read that General Electric or Lawrence Livermore Laboratory or Lockheed has received grant money, you may be sure that a proposal writer was involved in obtaining the grant.

Research and Development

Research and development is the starting point of manufacturing; therefore, there will always be a place for technical writers in public and private research institutes. Research reports of all kinds must be written to provide vital information for product development and manufacturing.

Government-Sponsored Activities

Opportunities for technical writers are also available with programs that are sponsored by the governments of the United States and Canada. Good starting points are the U.S. Department of Defense and the Canadian Department of National Defence.

As an example, the U.S. Department of Defense maintains a Defense Technical Information Center (DTIC), which provides centralized operation of department services for the acquisition, storage, retrieval, and dissemination of scientific and technical

information to support the department's research, development, engineering, and studies programs. Many universities and private research foundations also have government-sponsored programs. Additionally, the DTIC reports on all writings that it deems significant, even on work that was not government funded. This is a staggering task. In this country alone, there are thousands of industrial concerns ranging in size from Lockheed Martin to small shops that manufacture just one or two specialty items.

Employees of DTIC work in one of seven major categories, with the classification *technical information specialist* of particular interest to technical writers. The job is described as follows.

> Technical information specialists are primarily concerned with the direction, administration, development, coordination, and performance of work involved in processing and transmitting scientific, technical, or other specialized information. Requires a broad knowledge of one or more professional, scientific, or technical disciplines or fields of interest to understand the significance and relationship of the concepts and ideas contained in the information area and a practical knowledge of documentation or library techniques.

DTIC headquarters is located in Fort Belvoir, Virginia, and there are five additional locations throughout the country. Visit www.dtic.mil for complete information on this interesting career option.

In both Canada and the United States, many of the larger companies that manufacture highly complex machines, such as combat aircraft, computers, and nuclear power plants for submarines, also maintain huge research laboratories. Written reports on all of their activities, including ideas for new or modified products, must be submitted to the government. The organizations that submit these reports do so not only because they are required to, but also

because they hope that this information will lead to new contracts and revenues.

Trade Journals and House Organs

Almost every technical, commercial, and trade organization, and business association, no matter how small, publishes a monthly magazine that contains material of interest to its members. The articles included may discuss such subjects as the effects of crime, tax laws, or new marketing techniques on business.

Every company that has publicly traded stock issues an annual report to its stockholders. Some of these reports are magnificent beyond imagination and are often a staggering twenty pages long. A lot of work, money, and effort are expended in preparing these annual reports, which are intended not only to inform but to impress the reader.

Many large companies also publish and distribute *house organs* (technical magazines the companies produce) to their stockholders and libraries. An example is *The Lamp*, published by the Exxon-Mobil Corporation. This magazine presents articles in a narrative form about its far-flung operations, new technology it is adopting, its research projects, and its pro bono activities. These magazines are printed to present a favorable image of the company.

Special Projects

The wide variety of industrial concerns has created a need for special project writers. The vast field of research depends on the interchange of ideas, and because of this, many companies encourage their engineers and scientists to write papers for presentation at con-

ferences and seminars. The preparation of a paper is a very time-consuming process.

Some companies, particularly those with large research staffs, have a technical publications department whose function is to assist employees in preparing and presenting papers. The writers may use report drafts to write the entire paper, subject to editing by the presenter. Graphs, photographs, and digital images are often an integral part of the presentation. In addition, the writer may coach the presenter in delivering the talk if he or she is shy or a novice public speaker. Many executives now employ technical writers as special assistants. By combining a flair for writing with a sound scientific background, these assistants help top management officials by writing progress reports for them or reviewing their speeches.

With the continuous introduction of new technology, the communications field is an ever-changing and expanding field. Technical writers will be preparing lectures and instructions to be delivered from DVDs, developing programs for data storage and retrieval systems, and performing a multitude of other communications jobs too numerous to mention. To succeed, the writer must be able to learn new communications and computer techniques as they occur.

Technical Reports

Technical reports are found in any library, especially those in universities and government installations that conduct research. The number of these reports on file throughout the world is staggering and requires advanced storage and retrieval systems to reduce the space that all of this written material requires and to make it more accessible to users.

Technical reports represent a very large part of an organization's publication output. They also represent a great amount of the time devoted by many technical writers and editors.

A final report is usually preceded by a series of progress reports, which are short documents indicating what has been accomplished at stated intervals and submitted to the contracting agency. Sometimes a technical writer helps with this work; at other times it is done entirely by the researchers. If the project is complicated and takes a long time to complete, a periodic report is written that consolidates a number of individual progress reports. The periodic report also may be edited by a technical writer. A technical editor will work on the project once the material submitted by the scientists is put together into a report. For example, the National Air and Space Administration (NASA) spells out certain specifications for the format of its reports. This format must be checked by the editor, along with grammar, punctuation, and other stylistic features.

Report writing is one of the main categories of technical writing. As technology matures and as companies continue to grow, the volume of records and communications also grows. Reports are the usual method for many of the larger companies to coordinate their various activities, especially if research is a primary occupation. The publications department will be responsible for the reporting, and a technical editor will be assigned to supervise the undertaking.

Some engineering and scientific organizations exist primarily for testing, research, and experimentation. Their main product is not the manufacturing of goods, but the production of reports and papers describing research procedures and results. In this endeavor, the technical writer is as necessary as the researcher.

There are many kinds of reports, depending on who will use the information being reported. External reports go outside the com-

pany to clients, government bureaus, and libraries. They become the basis for further research. Internal reports are written solely for use within the company. They may be service reports, progress reports, and maintenance reports, to name only a few.

The reporting skill of the technical writer is important to most technical fields because reporting is basic to the success of the enterprise. The techniques of reporting are the foundation of instruction books, technical papers, and various forms of promotion and publicity.

A basic approach to technical writing is suggested by Matt Young in *The Technical Writer's Handbook*. In his preface he states: "It would be very easy to show how technical or report writing differed from other writing. My purpose, however, is to stress the similarities. Writing is for communication." Along these lines, he presents a few simple rules.

1. Write the way you talk; then polish.
2. Be explicit.
3. Write for the uninformed reader.

He continues by stating, "Many technical writers, unfortunately, seem to forget that their intention is to communicate, and they write as if for themselves. Their papers are insufficiently explanatory, and they are written with little or no regard for style or clarity. . . ." Even relatively good technical writing is frequently characterized by long, complicated sentences and difficult prose.

Young even points out that important papers may be ignored because no one can understand them, so the work about which they are written remains to be discovered independently by someone else!

Audiovisual Scriptwriting

You might not realize that technical writers can work in scriptwriting, but they are important contributors to training, instructional, and documentary films. And while many technical writers remain anonymous, those working in scriptwriting generally receive credit along with everyone else who worked on the project.

In general, these projects are produced by private film and television studios or even by large companies that have their own production facilities. The films and tapes are broadcast by private or public television stations. Some films, such as the Civil War documentary by Ken Burns, are so well done that they attain widespread fame.

Training Films

Audiovisual productions cover a wide range of topics. They are used for training personnel in industry, hospitals, and the armed forces. Private companies produce films that are distributed to their customers to teach their personnel how to install and operate newly purchased equipment. Schools use disks, tapes, and films for instructional purposes. Audiovisual presentations are popular at all educational levels from elementary through graduate school and for adult education.

The most popular method of training had long been the video, but that has now been largely replaced by the DVD because of its effectiveness in holding the viewer's attention. As a technical writer working on such a project, you need to remember that the DVD must complement the printed material so that it becomes a visual aid to encourage the viewers to think about what they have just seen. Also, consider how the visual presentation will provide the

basis for class discussions about its subject matter, which is the purpose of audiovisual projects.

In preparing a script, think about how it will look to the viewer and what effect your material will have on the audience. Once the script is written, consider what cinematography techniques you could employ to enhance the value and effectiveness of your work. This is an opportunity to give your creative imagination a workout. To create a great script, consider the following suggestions.

1. Determine the nature of your audience.
2. Do extensive research on your subject before you write a single line.
3. Simplify your message.
4. Tell a creative, visual story.
5. Write narration with eloquence, and dialogue with character.
6. Work with the director and the production crew throughout the entire filmmaking process.

A smart scriptwriter will take advantage of the expertise of all who are associated with the project. By soliciting their advice, cooperation, and suggestions, you will make your job easier and ensure the success of your film. A successful DVD will make the members of your audience receptive to your message and leave them feeling that they have learned something valuable.

Technical Films and DVDs

The technical or scientific film can be an effective way of selling a company's services or products. Film and DVDs play an increasingly important role in the training of technical and nontechnical

employees and present another area in which the trained technical communicator can find stimulating employment. Scriptwriters do most of the technical writing in the production of films and discs. This position can be interesting because it involves a multifaceted medium—communication that is linked with visual aids. Technical films are used for a variety of reasons:

- A film or DVD cuts across many audiences. It may be interesting to a large group of people and yet, at the same time, have a more specialized appeal to a particular smaller group.
- It can accomplish things that the product by itself may not be able to do and that a still photograph can do in only a limited way. Through drawings and cartoons, the film or video can enlarge views, reduce them, allow one to see inside a device, linger over it, and repeat it—all in motion.
- Films and DVDs have impact. Research has revealed that the combination of sight and sound impresses ideas and facts most emphatically upon the audience.

Once the central idea for the film has been determined, the manuscript is written that will be put together with action shots to make the final film. As the scriptwriter, you must decide what type of audience is being targeted—whether it is a group of specialists, managers, or people who are unfamiliar with the subject. This is a most critical stage for the technical scriptwriter.

Motion picture production is a complicated and costly procedure. If you decide to pursue a career in scriptwriting, it would be a good idea to get some training in this kind of writing in high school or college. And, although it isn't absolutely necessary, you will certainly benefit by knowing something about photography. Courses in cinematography would be advisable as well.

You'll have to visit shooting sites to become familiar with the location to be described in the script. And just as with any other writer, you must have an in-depth understanding of the product.

The story line is usually developed first. This is a kind of synopsis, or highly concentrated version of speech, action, and narration. Next, the actual motion picture shooting begins, scene by scene. Then the film will be reviewed, and as the scriptwriter, you may be asked to write a narration, which is an accompaniment to what the action means, usually spoken by a professional actor or reader hired for the purpose. Words must be written that are easily spoken and understood and that synchronize with the photographed action.

Technical Translation

When most of us think of technical writing, we probably think of writing in English for an American audience about American technology, or perhaps writing in French for Canadian readers. But technical writing is universal, and a growing number of technical writers must work with translations—reading them, evaluating them, and sometimes retranslating them from poorly written English into usable prose.

If you can write in Spanish, German, French, Japanese, Chinese, Hindi, or any other major language, you may find a job waiting for you in technical communications.

You can see the importance of technical translations as a career in the science or business sections of the *New York Times* or the *Wall Street Journal*. It is also evident in the technical magazines found in engineering libraries or in online publications, where you can find articles that have been translated from foreign languages into English.

Most major businesses and industries are global in nature, and the majority of large American and Canadian companies could not exist in their present form if they weren't able to communicate with companies and people in other countries. The electronics, chemical, and transportation industries and computer hardware and software manufacturers, among others, need manuals, reports, research papers, and technical advertisements that can be translated into foreign languages.

Industry professionals agree that global companies must publish in a variety of languages to reach a world market. Customers want to read instructions and manuals in their own languages and are more likely to purchase a product that offers this option. This is something to keep in mind as you study to become a technical writer. If you have any facility in a foreign language, continue to develop it. You never know when it may be a skill that appeals to a prospective employer and will give you an advantage over other applicants.

Document Coordination

Many technical writers and editors move beyond technical writing into document coordination. This role is frequently a management position and may include responsibility for the entire document production process. This involves following each document from the initial meeting with the client, in which the document's specifications are determined and the various activities of the researchers clarified, to the final publication and presentation to the client. The document coordinator also is involved in any modifications made in response to suggestions from the clients.

This function demands strong interpersonal and managerial skills, because document coordination requires the ability to elicit

material from the technical staff (who are often reluctant to write their research results), to interact with clients who may be uncertain of their actual needs in a particular document, and to work within personnel and budget constraints imposed by the company's administration.

The document coordinator often is required to visit job sites, help with data gathering and analysis, monitor the production of graphics, perform public relations functions on behalf of the company, control production costs, and perform a multitude of other activities. You may think these duties are beyond the scope of technical writing, but they quickly become great sources of challenge and satisfaction to the able individual.

Technical Editors

As in any editorial field, the primary responsibility of a technical editor is to constantly make decisions. Working in this field, you will have to decide whether the draft you are reviewing meets the quality criteria of the organization. You will make the final decision of whether to accept, reject, or revise the material, all with an eye to meeting a deadline. In effect, the quality of the final draft rests with you.

Among the many decisions a technical editor makes every day, a good number concern the form of a document rather than its substance. The editor must decide whether the words in the draft are the best ones to convey the author's meaning.

A technical editor at the Naval Explosive Ordnance Disposal Facility in Maryland has offered some thoughts about the profession. We think his words are a fitting summary for this section:

> We can say that the qualified technical editor is a sort of specialized jack-of-all-trades. He or she melds literature and science,

understands people, implements management policy, is objective, steers steadfastly toward a goal, and remembers minutiae. He or she can adroitly answer the writer's questions such as: Why are you taking the zap out of my draft? Why are you asking me what the test objectives are when I've already explained them in my report? What is your reason for requesting a rewrite with different conclusions? Why are you deleting the entire paragraph on potted electronic circuits?

Sample Job Advertisements

The following want ads show that interesting opportunities await those who have the requisite skills.

Video Scriptwriter

Firm that consults in corporate training and development is looking for a scriptwriter to create scripts for short video vignettes for a brand new project. Project would require full narrative scriptwriting for two to three key characters (project leader, their manager, and mentor) taking them through an entire project. Previous experience in creating client specific training or scriptwriting for similar projects is required.

Advertising Copywriter

Interested in fine and performing arts, foreign films, documentaries, and business training programs? Video distributor seeks versatile and self-disciplined copywriter with college degree and three to four years' experience to write copy and assist with video scripts and preparation. Applicant must have excellent verbal and written English skills and be detail-oriented.

The following job description is from an institute that serves a number of companies in the construction business.

> Secure and write construction-related articles through visits to design offices, building sites, and individuals involved. Report construction news including that obtained at sponsored conventions.
>
> Rewrite and amplify press release material received from outside sources. Edit construction-related papers and articles obtained from outside sources. Applicants should have experience or training in technical writing as well as in engineering and science.

To show the widespread opportunities in technical and professional writing, here is a sample job description from a pharmaceutical company.

> A leader in manufacturing and marketing pharmaceutical products on a worldwide basis, we seek a scientifically oriented writing professional who can initiate, develop, and coordinate our various communication requirements as follows: prepare scientific reports from raw medical data, investigators' brochures, package inserts, medical abstracts, and product information summaries. Review manuscripts for publication and marketing pieces for technical accuracy. Successful candidate should have a B.S. in chemistry, biology, or pharmacy, plus three years' writing experience.

Large vs. Small Companies

Large companies produce specialists. One person writes theory, another assembles parts lists, another coordinates with typists or illustrators. Most people are not involved with tasks outside their small area of activity.

In a smaller company (which is where many jobs may be located) a publications person, particularly a writer, must be a generalist. In

a smaller publications department, one with perhaps from five to fifty people, a writer is usually responsible for a project from scheduling through printing. This includes outlining, writing, laying out rough schematics and drawings, coordinating with clerical help, directing the photography of equipment, making parts lists, planning the final layout of the book, and preparing the printer's assembly sheets.

A human resources manager in an electronics company states that the increased need for technical writers can be attributed to a growth in the use of computers by relatively unsophisticated employers. Computers are used in virtually every business, no matter how small. While large companies can afford to employ computer specialists, in small companies the employees themselves must become the specialists with the aid of properly written instructions.

This presents another possible employment situation to explore. If you are particularly interested in computer science, try the smaller companies, and make sure that you include computers in your technical writing curriculum.

Opportunities for Advancement

To move up the career ladder, the technical writer can become a supervisor or a department manager. Managers may supervise not only technical writers, but also the people engaged in illustration, graphics, photography, and distribution. In short, supervisors mobilize their departments to produce the specified printed matter, be it a report, manual, or technical article.

The technical writer works at the center of advances in communication. When you join an organization, you may find yourself learning new methods of using graphics, transferring ideas and

facts to paper using current technology, and translating from one language to another. You will become a member of an organizational team, using your technical communications skills to assist engineers in presenting their ideas and designs. By interacting with the marketing staff, you'll find out what research is being done and help plan for new products.

Once you have become fully integrated into the organization and have mastered the skills mentioned above, you may find that one of the best opportunities for advancement involves becoming a supervisor or a department manager. Managers may supervise not only technical writers, but also the people engaged in illustration, graphics, photography, and distribution. In short, supervisers mobilize their departments to produce the specified printed matter, be it a report, manual, or technical article.

Importance of Teamwork

During their careers, technical writers come in contact with the management, research, and production divisions of their companies. This contact emphasizes the fact that the technical writer is part of a team.

You may wonder just what is meant by teamwork. In brief, it means contributing your skills as a writer or editor to a project at the same time that other people you are working with contribute theirs. Here are a few examples.

- You will undoubtedly have to work with nonwriters, people who may do very little technical writing throughout their careers. They may be engineers, managers, personnel people, artists, or audiovisual experts. Remember that they are experts in their fields,

even if they aren't writers. Sometimes you may have to call on these colleagues to provide the basis of a report or a research project or to suggest an illustration to go along with an important piece of work. They may give you sketchily produced work: the sentence structure may be poor or confusing; the style may not be your idea of good writing; the grammar may violate what you have learned in school. And this is where you act as part of a team, by acknowledging that each of you excels in your own area. You'll soon learn that the illustrator is a far better illustrator than you will ever be; the researcher is a far better chemist than you will ever be. Each contributes his or her special knowledge and experience to produce a successful project.

• You will frequently work with people who have given little thought to the kinds of readers they need to attract. In this case, it would be up to you to ask the author of a scientific paper you are editing such questions as: How much do your readers already know about the subject? How "technical" must your terminology be? Do you have to spell out everything? These are the questions of a team worker, and they must be asked with much tact and a great deal of consideration for people's feelings.

Suppose you have been given the job of coordinating a proposal that is submitted to NASA. Your company thinks that it can produce a superior electrical system for a missile, and NASA is definitely interested in hearing about it. It is up to you to get all the technical data on the electrical system from the engineers who have designed and tested it. Their data probably will be in the form of reports, test sheets, and innumerable calculations. Your job will be to sort out this huge amount of communication and present the

most important information to impress upon the NASA people that your company is well qualified to handle the job.

But this isn't the end of your assignment. You will have to attend meetings of the sales force so they can help you put your proposal across, giving it sales appeal. Then somewhere in the process, probably after you have written the first draft, you will have to meet with your company's top administrators, who will want to scrutinize your proposal backward and forward, inside and out. They must pass final judgment on what you have written, for the reputation and strength of the company depend on your effort, at least in the eyes of NASA.

Or, suppose that you have been assigned to write a manual. This can be a big job, requiring four or five people—a technical writer, an engineer, a designer, and an illustrator. Writing a manual is usually a long-term project. Although the material will originate with the engineers who worked on the equipment the manual describes, the technical writer must consult many other people as well.

You may be the person in the publications department who is responsible for the production of articles and papers. The basic material will come from the engineers and research people, but you will work closely with the public relations staff in trying to place the articles in national magazines. To get a single article in shape, you may meet with a veritable barrage of management executives, patent lawyers, and supervisors of one kind or another.

You can see, then, that the technical writer is not isolated in a tiny cubicle, working alone. Many hours must be spent on preparing and writing, and the writer will become adept at interviewing and attending meetings and become thoroughly familiar with the divisions of the company.

Final Words

You now know the many types of jobs that are available for technical writers and editors, and you can see that there is a good deal of variety in the possibilities that await you. In summary, let's review the distinctions between writers and editors and the general makeup of a publications department.

A technical writer prepares technical reports and articles for specific audiences, usually based on existing reports and on information obtained directly from the personnel involved. Typical documents may be highlights of research progress reported by many groups, slanted for management information; overall status reports; and technical papers or chapters of books, where expedient.

A technical editor is responsible for expediting or managing the writing and production of reports and papers required by management in the company's established forms and styles. The editor's responsibilities include editing rough drafts prepared by the technical personnel and coordinating illustration, proofreading, printing, and initial distribution. The editor may also prepare or coordinate style manuals and technical writing courses.

A typical publications department consists of editors and writers, photographers, illustrators and other graphics people, reproducers, printers, and production staff, all of whom contribute their expertise to prepare a publication for print. For example, take the idea of a writing-illustrating team—the art is not added as an afterthought but represents a complete integration of team effort throughout the project. The technical writer has conferred with each supervisor and has consulted the graphics department about pictures of the research involved and any charts or graphs that must be drawn.

Deadlines must be set with all of the people involved with the project, from the researchers to the graphic artists to the printers. If the schedule has been planned to allow enough time, there will be less chance of a bottleneck in distributing the final report. The pressure of deadlines can be formidable at times, and the ability to function well under such pressure is a prime requirement for technical writers and editors. When the proposal or report you are preparing could mean many thousands of dollars in business to your employer, you can be sure the deadline won't be taken lightly by management.

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Employers of Technical Writers

In the previous chapter, we discussed the different types of duties technical writers might perform. Now let's look at some specific employers and their technical writing staffs.

A survey conducted by the Society for Technical Communication asked publications managers about the depth and breadth of technical publications in the United States. These are just a few of the conclusions.

- Most technical publication work is done in industrial multidivision corporations.
- Most publication work comes from organizations with more than two thousand employees, and the publications departments report primarily to engineering, administration, and marketing.
- The most common job titles are *technical writer*, *technical editor*, and *technical illustrator*.

• An organization that requires personnel with degrees will hire those with a B.A. or B.S. in technical communication and others with a B.A. or B.S. in English or journalism. The majority of managers believe that employees with degrees in technical communication are better prepared.

The diversity of skills required by employers is evident from the many types of technical writing and editing that we examined in Chapter 4.

Industrial Companies

Almost all government research contracts contain a clause that requires industrial companies to provide periodic reports of progress, indicating the need for technical writers and editors as liaison between research and administration. An authority on technical writing offers this observation.

> Today, government contracts account for as much as 90 percent of the total business of many of the larger companies. Because of these contracts, the volume of progress reports, correspondence, and interplant communications has expanded enormously. The result has been that since 1945, industry has attempted more and more to employ professional writers with scientific backgrounds to take the load of product explanation off the already overburdened engineers.

IBM is an excellent example of industry's heavy reliance on technical writing staffs. IBM is a very large company, manufacturing a wide variety of products in plants all over the world. Technical writers are employed in each of its plant locations to write reports that are distributed internally among departments. For example, reports are circulated between laboratory and top management and from

domestic to international branches to prepare sales literature when the company introduces new products and to propose new ways of handling great masses of technical information.

IBM has offered many opportunities for success in the field of technical communications. For example, one young man who completed a tour of duty with the U.S. Army in Europe started and organized the publications department at IBM's Stockholm facility. With his fluency in several languages, he became a manager in the Far East Corporation of IBM.

Not surprisingly, the electronics industry employs many technical writers. An example is the Northrop Corporation, which needs technical communicators in many areas. One department that needs technical writers is avionics, which deals with the parts of an aircraft concerned with how the plane gets from one place to another, how the flight crew can communicate with various planes, and how the plane is controlled while it is in flight. Because it is so technologically complex, a great mass of reports and papers is generated by technical writers in this branch of electronics.

IBM and Northrop are only two of the many industrial companies throughout North America that employ large numbers of technical writers. One of the primary areas in which these companies use technical writers is internal communication. In such large companies, it is essential that employees on all levels and at all locations be kept informed about company news. This information is circulated by a variety of communication techniques such as in-house newsletters, faxed memoranda, e-mail reports, and internal group meetings.

As one of the largest single sources of technical papers for engineering and scientific journals, General Electric Company provides its scientists and engineers with a wide range of supporting services.

The company encourages employees to publish technical work and attend professional conferences, while remaining relatively free from the pressure to prepare routine reports. This means that technical writers relieve the engineers of the responsibility to write reports and assist in the preparation of their papers for presentation.

A look at the General Electric website also reveals the work of technical writers. Clicking on the "products and services" link will take you to descriptions of the company's many offerings, from the components of lighting control to the workings of a jet engine.

Technical writers also have found a secure niche in the chemical industry. A technical writer for Allied Chemical Corporation describes a publications job as editing technical and safety analysis reports, describing design criteria, and helping to write and edit journal articles, papers, and brochures.

A job description from a chemical company illustrates the duties of technical writers in these corporations. This company's technical writers are expected to do the following.

- Research journals, magazines, and the publications of other companies to locate technical literature that would be useful to the service and sales groups.
- Direct the preparation of rough drafts by the technical employees responsible for developing new products for the industrial market.
- Edit copy and supervise the layout and printing of technical literature.
- Prepare articles for technical magazines and speeches for technical conferences.
- Coordinate the literature output of the research departments.

Don't let all of this convince you that only large companies employ technical writers. With the increase of small companies as subcontractors, their volume of paperwork has increased greatly. Small companies are not necessarily selling their products to technical companies; many sell directly to the public. Because consumer products are increasingly complicated to operate, even smaller companies are compelled to furnish well-written instructions. It is a good idea to consider a variety of companies of all sizes when you are looking for a job. Remember, the directions for do-it-yourself kits for household equipment had to be written by someone.

At the same time you are thinking in terms of smaller companies, consider other places for employment. Some technical writers prefer to work for agencies producing services rather than goods. Technical writers have worked for such agencies as the Travelers Insurance Company in the capacity of senior technical writer in the engineering division. Another agency known to hire technical writers is the National Oceanic and Atmospheric Administration.

Research Groups

Research organizations are another excellent source of employment opportunities for technical writing positions. Some are part of the companies themselves, some are supported by universities, and others are privately endowed.

Regardless of their management, all research groups have one thing in common—they work to find new ways of doing things, whether that means developing new products, designing new communication systems, or treating diseases. Frequently their efforts do not show results for many years, but they generate an incredi-

ble flow of reports, science and engineering papers, and presentations before technical audiences.

Consider the ongoing research conducted by pharmaceutical companies, which work to develop medications and products that are vital for the public's health. For example, Pfizer Inc. employs more than one hundred thousand workers and twelve thousand medical researchers and currently manufactures over fifty prescription medications. If you were a technical writer for Pfizer, you would collaborate with chemists and biologists trying to identify new methods of treating illnesses, with geneticists who study issues of heredity, with neuroscientists who research the brain's involvement in illness and its response to drugs, and with engineers who produce the drug based on the research results.

Since it is vitally important that medications are safe and effective, you can only imagine the number of reports that the company must prepare throughout the research and development process of a new drug. These include internal communications within the company, progress reports, reports to government regulatory agencies, and papers presenting research findings. We've all filled at least one prescription and hopefully have carefully read the patient product information that accompanied the medicine. The need for technical writers and editors is evident given the variety of information that must be communicated.

Some research organizations are not affiliated with large industrial concerns. An example of this special type of research institute is Battelle Science and Technology International. Battelle contracts with both industry and government to develop scientific and technological innovations and manages research laboratories for its customers. With the national labs it manages or co-manages, Battelle oversees nineteen thousand staff members and conducts $3.7 billion in annual research and development. The company also works

with more than eight hundred federal, state, and local government agencies to provide science and technology in the areas of national security, homeland defense, health and life sciences, energy, transportation, and environment. Given all of these activities, you can see that the scope of activity for a technical writer associated with Battelle is almost endless.

Many universities also have large research organizations that are heavily dependent on government contracts. One is the University of Dayton Research Institute; another is Lawrence Livermore National Laboratory, affiliated with the University of California.

Government Agencies

Government units employing technical writers usually fall into two categories: federal and state or provincial groups that use technical writers for their own work, and agencies that work closely with companies and industries.

The governments of both the United States and Canada maintain websites through which you can search for and apply for federal jobs. A quick search of the U.S. site, www.usajobscom, shows that at this time positions for technical writers and editors are available with the Department of Agriculture, the National Archives and Records Administration, the Federal Reserve System, the National Institutes of Health, and the Air Force Personnel Center, to name just a few. The Canadian site, www.jobs-emplois.gc.ca, shows availabilities with Defence Construction, Parks Canada, and the National Research Council.

In general, technical writing jobs for the federal government are classified as those that provide internal communications and those that deal with external contacts. Writers working on internal communications can be described as follows.

• **Public information specialist.** This category includes writers who not only collect information about the many activities of the commission, but who also write and disseminate information about the many programs available in federal government. As an information specialist, you could be involved in writing for a variety of public communications media, including newspapers, television, magazines, and the Internet.

• **Writer-editor.** This job should appeal to you if you have substantial knowledge in the areas of engineering or science. The federal government employs writers and editors to produce articles, press releases, periodicals, pamphlets and brochures, speeches, and scripts for radio, television, and film.

As a writer or editor for the federal government, you would research the subject to be described, select the information to be included, and write or edit the final manuscript. Many in this group specialize in technical fields such as engineering, science, or the social sciences.

Technical writers and editors working in the second category deal with strong industrial contacts. Some government agencies work so closely with private companies that it is hard to distinguish between the two. One example of this relationship is the Mound Plant at Miamisburg, Ohio, operated for the U.S. Department of Energy by the Monsanto Research Corporation.

Mound Plant is in the forefront of energy research, providing leadership in such areas as polonium technology, thermal diffusion, and reactor fuel studies. This complex and extensive research requires the services of many skilled technical writers. One writing group is responsible for the preparation of the manuals that must accompany every project before its results can be implemented.

Another group, the Technical Information Office, is responsible for the preparation of technical papers for publication in journals, for answering inquiries of a technical nature that are received by Mound Plant, and for editing and publishing periodic progress reports.

Government research groups are not all run by large companies. Some government agencies are found in the military itself, developing weapons, missiles, and equipment for space exploration. The Adelphi Laboratory Center (formerly the Harry Diamond Laboratories), part of the U.S. Army, is one of these agencies, as is the Naval Air Weapons Center at China Lake, California. These military agencies provide numerous career opportunities for civilian and enlisted technical communication specialists.

Journals and Magazines

As we have discussed previously, the technical writer working in the journal field is usually required to edit someone else's work and prepare articles for publication. In doing this, the writer works closely with the author, restructuring ideas and checking grammar, punctuation, and spelling. Eventually, the technical editor may be asked to write original articles in some specialized fields. A brief discussion of the different categories in the technical magazine market should help illustrate the variety of career opportunities available.

Journals

First are the journals, sponsored by professional societies. You are probably familiar with a number of these, and you may even belong to a chapter of an engineering society, such as the American Society of Mechanical Engineers.

Practically every professional association publishes its own journal. *Aerospace America* is self-descriptive, as is the *American Journal of Agricultural Economics*. Two of the better-known ones are the *Journal of Chemical Education*, published by the American Chemical Society, and *Engineering Times*, the journal of the National Society of Professional Engineers.

These journals have several common features: they usually publish papers based on original research, they operate with comparatively small staffs, and they are mainly read by people in the same field as the sponsoring society. Regardless of its individual makeup or audience, the technical journal must be edited by skilled technical writers.

One of our former students, for example, is an assistant editor of *Theriogenology*, an international journal of animal reproduction. She is responsible for editing (including visual aids) all articles submitted. Many manuscripts, especially some submitted by foreign authors, require extensive revision. She also indexes the volumes of the journal, compiles the front matter, and corresponds with authors and reviewers.

Commercial Magazines

Commercial magazines are found in technical libraries in every country. McGraw-Hill publishes several technical, scientific, and business magazines, including *Aviation Week and Space Technology*, *Engineering News-Record*, and *Architectural Record*. Penton Media Inc., another well-known publisher of technical magazines, produces *Electronic Design* and *Ward's Auto World*, among others.

Most editors of commercial technical magazines are interested in interviewing qualified technical writers for staff positions. These editors realize that their competitive journalism field requires fresh

talent, which means hiring new people with good technical training and the ability to write.

But you should realize that there are differences between working on journals and working on commercial magazines. The latter are money-making concerns, employing large editorial staffs. For this reason, the chances of obtaining a job with a McGraw-Hill or Penton magazine are greater than with such specialized publications as *Journal of Nuclear Materials* or *Neuroscience*.

Company Magazines

As previously mentioned, one particular form of technical magazine, the *house organ*, is put out by a company's publications department. House organs usually fall into two classes: those for outside readers and those for internal readers. The *RCA Engineer*, published by the Research and Engineering Division of RCA, is a highly technical publication. On the other hand, Oak Ridge National Laboratory publishes *Review* largely for internal readership, and it is distributed to employees and others associated with the laboratory. The staff writes and edits a variety of articles: some deal with interesting people employed by Oak Ridge National Laboratory; others with work in progress in the research area. A magazine like *Review* could offer an opportunity for a writer with a combination of training in technology and journalism.

Trade Journals

Another class of magazine is the trade journal. While it can be a little difficult to define, a trade journal bears the same relation to a technical magazine that a trade bears to a profession. It features down-to-earth articles on how things are done, methods of pro-

duction, and tips to readers in various trades. There are trade magazines for a variety of occupations, such as *Restaurant Report*, *Women's Wear Daily*, *National Jeweler*, and *Mortuary Management*.

Books

Although we've been talking about magazines, we shouldn't forget book publishers as potential employers. John Wiley and Sons is one of several large publishers of engineering and science textbooks that require editing by highly qualified people who act as liaison between the company and its authors. The *McGraw-Hill Encyclopedia of Science and Technology* is a twenty-volume work containing over seven thousand articles contributed by five thousand internationally known researchers. A graduate of Rensselaer Polytechnic Institute's master's program in technical writing worked as a staff editor on the most recent revision, handling most of the field of physics, plus aeronautical and nuclear engineering and space technology.

More and more publishing houses that produce technical and scientific books are looking for specialists, technical editors who can help authors and who are familiar with the content, vocabulary, and audiences of technology.

Support Companies

There is a growing industry of small businesses that might be called *support companies* and that produce technical brochures, manuals, and other publications and materials under contract with larger manufacturing firms. They generally fall into two groups: those that serve as consultants and help promote company products and those that act as contractors by doing the actual writing.

An example of a consulting business is industrialpublicity.com, a business-to-business Internet publicity service. With a staff of experienced technical news writers and editors, the company serves its clients by reaching the publications, industrial newspapers, Internet news sites, and electronic media that correspondingly reach a customer's market base.

An online publicity service, industrialpublicity.com was founded by Allan G. Hall, who has worked in industrial publicity for over twenty years. He has a degree in manufacturing engineering from Miami University and completed the General Electric Manufacturing Management Training Program. He is a member of both the Society of Manufacturing Engineers and the Society of Automotive Engineers. He also has written hundreds of technical feature articles in the industrial and metalworking industries. He is joined on the editorial staff by a full-time freelance writer who specializes in the automotive industry; a manufacturing engineer who has written and presented technical papers and is a past editor of *Tooling and Production Magazine*; the current editor of *Powertrain International*; a professional in production, account services, and public relations who specializes in industrial publicity; and an experienced copywriter who works on advertising, brochures, mail kits, newsletters, videos, and websites.

Based on the collective experience of the staff of industrialpub licity.com, you can get a sense of the various opportunities for technical communicators with small companies.

Although the line between consulting companies and contracting companies in technical writing can be blurry at times, some distinctions can be made. A contractor is essentially a specialized organization that handles publication projects for larger companies

that either don't employ a publication staff or are too busy to complete the work in-house.

Suppose that Radio-Electronics Company has received a large order from the government for a fire control system on a line of navy ships. Radio-Electronics is prepared and able to manufacture the system, which will require operating and maintenance manuals. Rather than overtax its publications department, the company contracts with Roberts Technical Writing Service to prepare the necessary manuals. This outside company now adds Radio-Electronics to its list of clients for this job only. Perhaps it will be the only job on which the two companies will ever work together, or it might be the beginning of a profitable professional relationship.

A successful technical publication contracting firm must be able to provide specialized services in the preparation of catalogs, brochures, or training manuals, and it must be able to work in any media, including print, electronic, and video. The company can hire additional staff on a temporary basis for large projects, which helps to keep a lower overhead.

A contracting writing service will plan the entire publication effort for a particular project, doing all the necessary writing and editing. It will offer a complete illustration and graphics service and will either do the printing or have it done. It will deliver the final product to the client or distribute it as contracted. In the long run, the contractor supplies a complete communications package to its client, with little responsibility on the client's part beyond the necessary input and final approval.

Higher Education

Many colleges and universities are engaged in industrial research and development, particularly those with strong science and engi-

neering faculties. Just think of Stanford University's Research Institute, MIT, and CalTech.

There are hundreds of institutions throughout North America whose teaching staffs are active in either government- or industry-sponsored research. As the number of academic discoveries and inventions increases, so does the need to convey information to industry and government, as well as to the general public. This policy of sharing results is known as "technology transfer."

An independent study of several such college research groups shows a trend toward hiring technical writers to prepare reports. Over half of the respondent groups employ one or more writers. Most of the technical writers work in public relations, a small number work in research, and some are employed by the university press. Many of the writers are graduate students studying communications; others have come from industries that have publications departments. The variety of qualifications required include five or more years of professional writing experience, a B.S. or B.A. degree, an interest in science and technology, and a flair for technical writing.

The results of this study show that there are many places in academic life for technical and scientific communicators. For example, the Child Development Institute at the University of North Carolina at Chapel Hill employs a writer and editor who collaborates with other technical communicators and develops programs for assistance in using media devices.

Teaching Technical Writing

More and more colleges are offering communications courses for students whose major fields of study are engineering, sciences, and liberal arts. At the University of Florida, for example, all future engi-

neers are required to take basic technical writing. This alone has increased the enrollment in the course by some four hundred students a year.

We mention this to indicate that colleges teaching technical writing need more teachers. Some of these teachers have already prepared themselves by obtaining special degrees at such schools as Rensselaer, Carnegie-Mellon, and Colorado State. Others are branching out into what is a completely new field for them.

Schools of journalism recognize that their graduates may get jobs in science writing for newspapers and journals. They also may end up in publicity or advertising with a heavy science slant. All of these students of technical journalism must be instructed by qualified teachers, which creates more opportunities for technical communication instructors.

You will find that most positions require an M.A. or Ph.D. degree and that administrators favor applicants with some experience in teaching technical writing. So how can you qualify for these positions, especially if you are coming from a traditional English department?

Some universities offer English courses, particularly at the graduate level, in the practice and teaching of technical writing. A typical graduate-level course of this kind would offer instruction in business and technical communication, providing you with basic texts, study outlines, and assorted assignments and exercises.

If departmental courses are not available, you have other options. Several universities offer week-long institutes and seminars. These present opportunities to network with many people, trade ideas, and get a real feel for the discipline. The institutions and seminars regularly cover useful classroom topics, such as types of technical writing courses, designing objectives for technical writing courses,

report writing topics and assignments, evaluation and grading of student papers, and computer-assisted instruction.

Frequently these programs will include information about resource material available to technical writing teachers, areas of needed research, and consulting possibilities. Most of the programs include workshops in which the participants practice various technical writing skills to give them a better understanding of some of the problems their students may face. Any technical writing teacher will gain valuable experience and acquire much useful information by attending such a program, and the teacher seeking a technical writing teaching position will enhance his or her credentials by participation.

The annual conference of the Society for Technical Communication (STC) is also an excellent source of information. What better way to learn than to talk with professional writers and well-known teachers? You also may learn about the prevailing job market and meet with potential employers. In addition, associations such as the Modern Language Association and the Popular Culture Association have begun to include panel sessions on various aspects of teaching and research in technical writing in their national and regional meetings. This is concrete testimony of an increased awareness of the importance of technical writing teaching at a time when there are many cutbacks in other teaching areas.

Teacher Resources

The new teacher can draw on a variety of resources. A basic exposition syllabus, coupled with a reliable technical writing text and any supporting materials gathered from the sources already mentioned, is a starting point. *Technical Communication Quarterly*, a journal published by the Association of Teachers of Technical Writ-

ing, provides many useful suggestions contributed by experienced teachers. In the same category is the *Journal of Business and Technical Communication*, which includes articles by both teachers and industrial writers. You can easily carry over into your classes many of the ideas suggested by practicing writers.

The STC provides much useful information through its magazine *Technical Communication* as well as a series of specialized collections including *Teaching Technical Writing* and *How to Teach Technical Editing*. The National Council of Teachers of English has put out several pamphlets on teaching technical writing, and its journal, *College English*, publishes some fine articles on technical writing that the new or experienced teacher will find useful. A bibliography of references for many areas of technical writing, as well as a list of periodicals and journals, is included in the Recommended Reading section at the end of the book.

Consulting and Freelance Writing

Much has been written about the possibilities of consulting in technical writing—going into a company to help it solve its writing problems, perhaps through a series of in-house training courses or through individual work with the company's writers and editors. Other articles discuss possibilities as a freelance technical writer. *Technical Communication*, for example, has explored consulting in depth.

If working as a consultant in technical communication interests you, first consider the amount of competition in the field. You'll need a reputation or some recognized affiliation, with a university for example, to get work. It is very difficult to develop a lucrative consulting business when several large communication consulting

firms already exist and many highly experienced technical writing instructors offer their services as consultants. Consulting has long been seen as an added benefit of college technical-writing teaching, but recently we have seen numerous advertisements for consultants to work with national companies. Usually these positions require some teaching background, most require a Ph.D., and all require extensive travel. In such positions, your duties would include offering intensive short courses for various industries and organizations throughout the country and, possibly, in foreign countries. This is demanding work, is usually high paying, and may represent a career choice for those unable to gain secure university teaching positions.

Freelance technical writing may offer more possibilities for the newer professional. Often small organizations that cannot afford permanent full-time technical writing personnel will hire others on a temporary basis or will have work available for writers to do at home.

For several years, one of our students supplemented her income by documenting computer programs at home, using a terminal supplied by the company. Another student gained valuable experience writing and editing study guides for the Certified Public Accountant exam and the LSAT. Part of her job was to design reading comprehension tests (for the LSAT), which included selecting relevant passages and making up reading questions that were followed by the correct answers and explanations of the answers.

This can be a good way to begin if you are still a student or are new to the field and wish to develop some credentials. For the experienced professional who prefers on-call work or to work in his or her home on a variety of projects for a variety of clients, freelance technical writing offers worthwhile possibilities.

Summer Employment

Opportunities for students to find summer employment in technical writing generally vary according to the national economy. Nevertheless, well-trained students who are willing to look for work should be able to find summer positions. A technical communication student who worked during the summer for IBM described his work as follows:

> Our first big project was to edit and revise a manual describing the testing process used to warm up a computer for full-on operation. . . . As it was essential in this writing project to become thoroughly familiar with the equipment, we visited the site where the equipment had been designed and built and was being tested. We talked with the engineers on the project in order to completely understand the equipment. Finally, we took the existing manual, deleted much of the material from it, and added quite a lot of new material.

Ask yourself a few questions to determine whether you should pursue summer employment. Has your educational background prepared you to handle the products of science and technology? Are you a good enough writer to handle the communication phases? Do you live in or near an area that needs technical writers, or are you willing to relocate temporarily?

Some people argue that summer employment in technical writing is a waste of time; that in such a specialized job, a major part of the summer may go by before you can really become productive. Despite this opinion, if you can find a summer job in the field, by all means take it. It will offer you the chance to get your foot in the door, giving you a decided advantage over other applicants with no experience who must start from scratch after graduation.

A summer job will also give you a chance to see if you are really suited for a technical writing career and whether the working conditions are what you expected them to be. Most employers will give you on-the-job evaluations of the work you have been doing and will let you know whether there will be a permanent job available after you graduate.

No organization, however, is willing to give you a free ride for the summer. You must demonstrate ability to get the work done, enthusiasm, and a desire to learn. Among the principal academic requirements today are a sound science background, competence in writing, and computer skills.

Working Overseas

In addition to the United States and Canada, there are technical writers working for companies in South America, England, Europe, Israel, India, Japan, and other countries all over the world. If you speak or write a language other than English, you may be qualified to work in one of these countries.

The best place to start to locate overseas jobs is on the Internet. A search will reveal databases of job listings, employment agencies, and many free job-placement services.

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Related Fields and Growing Trends

Technical writing is only one part of a larger picture of professional writing and that encompasses the skills applied to such professions as medicine, pharmaceuticals, public health, and business.

The two kinds of professional communication that bear the greatest resemblance to technical writing are medical writing and business writing. Each has its own professional society: the American Medical Writers Association (AMWA) and the International Association of Business Communicators (IABC), both of which serve members in the United States and Canada (addresses are given in the appendix). Some writers belong to both of these organizations, as well as to the Society for Technical Communication. Because of their common characteristics, what we have already said about technical writing can certainly be applied to medical and business writing.

Medical Writing

Medical writing is a wide-ranging field that covers the many different areas of medicine, including the science and allied health professions. Medical communicators may work on a variety of documents and projects specific to the field. Like their counterparts in technical writing, they also have the option of working in different areas of communication.

Duties of Medical Editors and Writers

According to Dr. Eric W. Martin, past president of AMWA and author of the association's code of ethics, the duties of medical editors and writers may include the following:

- **Clinical brochures.** These publications contain the all the data gathered by a company from years of research on new drugs.
- **Case report forms.** With these forms, medical writers help clinical investigators report on the medical histories of patients.
- **Clinical research reports.** Medical writers prepare these summaries of research and clinical data that are important in determining whether drugs will be available for patient use.
- **Clinical papers.** In the preparation of these papers, the medical writers give editorial and writing help to busy scientific investigators.
- **Physician brochures.** These brochures specify dosages, side effects, and other pertinent information that doctors must have to safely and effectively treat patients.

- **Official brochures.** These are commonly known as package circulars or package inserts, again for the benefit of the physicians.
- **Abstracts.** Medical writers screen hundreds of important journal articles and condense them for scientists and researchers.
- **Guides.** The manufacturers of medical products must follow strict federal and state government regulations. Medical writers frequently prepare manuals to interpret these controls for company employees.
- **Media preparation.** Medical writers coordinate the preparation of motion picture scripts and digital presentations.

If you have a strong background in chemistry or biology, investigate the possibility of working in the pharmaceutical rather than the chemical industry. If the ultimate consumer of the company's products is the public, then as a communicator for such a firm, you would be classified as a medical writer.

Medical Journalism

If you visit a medical library, you will be overwhelmed by the number of journals available there; a trip to the stacks will find you surrounded by thousands of volumes covering every possible aspect of medicine. Perhaps you'd like to contribute to this incredible wealth of information. What we have already said about technical journalism in previous chapters pretty well applies to medical journalism. If you join the staff of the *Journal of the American Medical Association* or a more general magazine such as *Today's Health*, you

will be writing articles, editing other people's work, and acting as a liaison with artists and production personnel.

Freelancing

Many freelancers work in medical writing. The majority work from home offices on manuscripts and reports originally written by doctors and researchers who are too busy or lack the writing skills to produce a final manuscript. Frequently these freelancers are highly qualified scientists who wish to do only part-time work. If you are trained in biology, chemistry, or in one of the more specialized sciences, you may wish to consider this very important kind of medical writing. It may be just the right kind of employment for you.

Medical Advertising

You may find a niche in medical advertising. Just as there are many technical advertising firms and public relations firms, there are also many advertising companies that specialize, at least in part, in drawing the attention of the public and of physicians to the availability of new drugs.

Medical Writers at Work

To illustrate some of the opportunities in medical writing, here are brief accounts of two professionals working in this field.

A young woman who earned a B.A. in psychology and English and an M.A. in psychology was hired by a large army medical center as a technical publications editor. The center was issuing an increasing number of scientific papers and was about to publish its own journal. This position led to a more challenging one in an army research institute. In addition, this medical writer has been made

an associate editor of a journal of sports medicine and an editorial consultant to the Eisenhower Medical Center.

Another writer who has a B.A. in journalism worked briefly as editor of a trade publication and later became an editor for a publishing firm that produces technical books and pamphlets. He then joined a state health department as an editor of its monthly magazine. His current duties include writing and editing pamphlets, booklets, and brochures for all units within the department; preparing the annual report; and preparing news releases concerning department activities and providing information for the press. When asked to classify his position, he describes himself as a public health writer.

Many physicians have become medical writers, just as many engineers have become technical writers. For example, one writer received a degree in pharmacology from one college, a B.S. degree from another, and a medical degree from a third. He has been both a practicing pharmacist and a physician and has also served as medical director and director of research for a large chemical manufacturing company. He is now employed by a New York advertising firm as medical director in charge of clinical research. It is the job of his department to delve into the research and manufacture of the drugs and chemicals of his client firms so that they may be advertised intelligently and accurately in the medical journals.

American Medical Writers Association

The aim of the American Medical Writers Association is to bring together all North Americans who are employed in the communication of medicine and allied sciences in order to maintain and advance high professional standards. Its purpose is educational, sci-

entific, and literary. At an annual meeting addressed by distinguished authors, editors, and teachers, members have the opportunity to keep informed on the progress being made to maintain and advance high professional standards and thus to aid in general medical advancement.

The association publishes the *AMWA Journal*, which is delivered quarterly to members and subscribers. It is an authoritative, comprehensive source of information about the knowledge, skills, and opportunities in the field of medical communication worldwide.

AMWA offers an extensive continuing education program that allows professionals in the medical and allied scientific communication fields to explore new areas of expertise in order to enhance their skills. More than one hundred educational sessions are offered during a three-day annual conference, including curriculum workshops that can also be applied toward AMWA's certificate programs. Earning an AMWA certificate is considered part of a career path in the field and is required by some employers.

Workshops are also offered at AMWA chapter-sponsored conferences presented at various times during the year, and approximately twenty workshops are available for on-site presentation at companies' facilities. There are also a number of self-study workshops available that include a combination of a workbook and CD-ROM. Two examples are *Basic Grammar and Usage* and *Punctuation for Clarity and Style*, which can be ordered through the AMWA website.

AMWA Certificate Programs

AMWA offers three certificate programs: core, advanced, and science fundamentals. Participants in core workshops can learn how to improve editing, writing, communication, and bibliographic

skills; how to develop and manage a freelance business; learn the skills necessary for writing for the pharmaceutical industry, public relations/advertising/marketing, or Web/multimedia; discover the latest methods for educating writers and editors; and brush up on statistics. Advanced workshops provide experienced medical communicators with in-depth consideration of issues in writing, editing, management, bibliographic research, education, and other topics of interest. Workshops in science fundamentals offer participants an opportunity to deepen their understanding of basic concepts in science and medicine. This curriculum is designed for medical communicators who do not have a university background in science and for those educated in science who wish to learn more about areas outside their specialties.

Core Certificate

Participants can earn a core certificate in one or more of five specialty areas: editing/writing, educators, freelance, pharmaceutical, and public relations/advertising/marketing. To receive a certificate, participants must successfully complete four general workshops and four additional workshops from the specialty area of their choice. Participants may also earn a multidisciplinary core certificate by successfully completing four general workshops and six specialty workshops chosen from three or more of the specialty areas.

Multiple Certificates

After earning their first core certificate, participants can earn additional certificates in different specialty areas. For each new certificate, participants must pay an additional enrollment fee and then complete four more workshops from the new specialty area. The work for each new certificate must be completed within four years.

Science Fundamentals Certificate

Participants must successfully complete four general science workshops and four additional workshops from specialty areas such as body systems, diseases, or diagnostics and therapeutics.

AMWA Advanced Certificate

The advanced workshops are designed for those who have earned AMWA core certificates or have a minimum of five years of experience in the topic covered by the specific workshop. Earning an advanced certificate requires the completion of eight advanced workshops. Some advanced workshops require core workshop prerequisites that cannot be waived. Therefore, in choosing core workshops, participants should consider which advanced workshops they may eventually want to take.

Business Writing

If you choose a career in business writing, you may be dealing with readers ranging from business managers to the general public and with such topics as human resources to consumer relations.

In planning a career in business writing, you should study business and the communication of business. Since business writing is highly specialized, it is important to carefully select the kind of writing or editing you will train for. It's one thing to write repair manuals, but something else altogether to write training materials for the sales personnel. You should assemble a portfolio of samples of your work, and you should learn to write good letters of application to accompany your professional portfolio.

Types of Business Writers

Business writers fall into a number of classifications, including the following, which are adapted from the IABC.

- **Informal auditor.** Performs operational reviews and reports on recommendations for management
- **Financial analyst.** Does analytical reporting
- **Accountant.** Writes company policies and procedures
- **Researcher (advertising).** Gathers, organizes, and writes final reports; makes formal presentations of findings to clients
- **Product advertiser.** Plans and coordinates product development; composes literature and sales aids
- **Community planning specialist.** Writes, edits, and reports on community concerns
- **Planning director.** Oversees and prepares copy for promotional literature
- **Publications specialist.** Prepares original copy, graphic arts, and layouts
- **Corporate relations officer.** Writes news releases and edits materials
- **Proposal specialist.** Plans, writes, and produces contract proposals

This is only a partial list of the possibilities for business writers. In all the descriptions, you will find that, once again, there is an overlapping of job duties among business, medical, and technical communicators.

International Association of Business Communicators

IABC is the professional organization for business writers. Its more than fourteen thousand members are from seventy countries, and they work in every aspect of business communication.

The aims of IABC are similar to those expressed by STC and AMWA: to promote professional standards and provide a forum for its members. IABC carries out its purpose through an annual national convention and regional meetings and seminars offered throughout the year by individual chapters.

IABC publishes *Communication World*, its magazine for members that offers articles written by leaders in the field of business communication. *CW Bulletin* is an e-newsletter supplement to the journal that is sent to all members every month.

The association also sponsors Student Connection, a variety of resources and opportunities for students who plan to enter the communication profession. It allows students to gain insights from leaders in the profession, make valuable contacts, and supplement their academic education with practical training.

IABC Training

The IABC offers training opportunities ranging from in-depth conferences and seminars to convenient distance-learning sessions delivered directly to your office. The options in distance learning include teleseminars, Web seminars, and online seminars. Teleseminars are sixty-minute telephone sessions led by IABC conference speakers and include downloadable handouts. Web seminars are ninety-minute telephone sessions with visuals presented on the Web. Online seminars consist of ten hours of training taken dur-

ing a two-week period. Members who complete four seminars earn a professional certificate in strategic communication management.

Accreditation

Accreditation is an IABC professional development program that allows communicators to demonstrate their ability to think and plan strategically and to successfully manage the skills essential to effective organizational communication, which could include internal communications, media relations, crisis communications, and external relations.

To earn the designation of accredited business communicator (ABC), you must be a professional communicator with a minimum of five years of experience in business communication (organizational communication, public relations, or communications management) and a bachelor's degree or a total of nine years of combined postsecondary education and/or experience.

There are three steps to the accreditation process, each of which must be successfully completed before proceeding to the next. The steps are an application, qualification (the portfolio), and written and oral examinations. Each portion of the process contributes to your score—the portfolio grade counts for 25 percent of the total, the written exam counts for 58 percent of the total, and the oral exam counts for 17 percent of the total.

- **Application.** Your application should be a comprehensive summary of your professional experience and qualifications; it will be used to determine your eligibility to proceed with the accreditation process. Several IABC chapters offer accreditation workshops and local mentoring programs to help candidates present the most compelling applications.

• **Qualification: The portfolio.** Your portfolio must include two work samples, with work plans to demonstrate the range of communication projects or programs you've been responsible for and your ability to plan and work strategically. Candidates must receive a passing score of 4.0 or better (using a 0–7 scale) on the portfolio to qualify to take the examination.

• **Examination.** The examination tests your knowledge of communication and management skills. The exam is four and a half hours long and includes a written and oral test.

Visit www.iabc.com for complete information about the accreditation process and the dates and locations of upcoming exams.

Trends in Professional Education

More and more colleges, universities, and technical schools are offering courses and programs in technical communication, making it easier than ever for you to find the curriculum you want in a school near you.

Another trend in professional education is employers' increasing interest in graduates with master's degrees. An advanced program of this sort will give you the time to acquire more skills and is frequently a step toward a supervisory or management job. Human resources interviewers are always looking to the future—do the candidates for a job have the characteristics and skills that will favor promotion into managerial positions?

Global Information

Companies also are looking for applicants who can handle worldwide documentation systems. Technical writing students must be

trained in the operation of these communication systems and on procedures in sorting out data and dealing with foreign countries that need the data.

If you examine the course listings of most colleges, you will find classes that address the subject of global information. Communication systems are now standard in many colleges, and courses in technical German, French, and other foreign languages are available, too.

Machine Translation

If you have knowledge of one or more foreign languages and are skilled in technical writing, you should be well equipped to work with translating equipment to convert foreign languages into English and vice versa.

Machine translation (MT) is a subfield of computational linguistics that investigates the use of computer software to translate text or speech from one natural language to another. At the most basic level, MT performs simple substitution of words in one language for words in another. Using advanced techniques, more complex translations may be attempted, allowing for better handling of differences in phrase recognition and translation of idioms.

Current machine translation software often allows for customization by domain or subject area, which improves output by limiting the scope of allowable substitutions. This technique is most effective in domains where formal or formulaic language is used. For example, machine translation of government and legal documents more readily produces usable output than conversation or less standardized text.

To give you some idea of how translators and technical writers may work in machine translation, we contacted William L. Ben-

zon, a renowned expert in technical communication. Dr. Benzon is associate director of the World Development Endowment Foundation and a former assistant professor of communication at Rensselaer Polytechnic Institute. He said:

> As high technology spreads across the globe, the need for rapid, reliable, and relatively cheap translation of technical documentation grows proportionately. Translation, however, is slow, boring, but highly skilled work, which adds up to its being very expensive work as well. On the other hand, computers are fast and they don't get bored. If they can be programmed with skills sufficient to the task, then fast and cheap translation may be possible.

Whether translation can be done by machines depends on the fact that most of the decisions to be made in translation are, in principle, as routine as the multiplication tables. Those decisions can be made quickly and accurately by a computer with the requisite software. However, many of those decisions depend on prior decisions of a different class, decisions that cannot be specified by some routine procedure. These decisions concern the meaning of the text and seem to require encyclopedic knowledge of the text's content. Current software provides literal, not idiomatic (everyday) language translations, so its use is restricted. Translated text must be converted into good idiomatic language, and there is an ongoing effort to solve this problem.

To illustrate the difficulty of idiomatic versus literal translation, consider the phrase, "the coast is clear." In Spanish, the equivalent phrase is *no haber ningunos moros en la costa*, whose literal translation is "there are no Moors on the shore!"

At present there are more practical machine aids to human translators, called MAT (machine-aided translation). Several MAT systems are in use by government agencies and private corporations,

and this subfield of technical communications should grow rapidly. Machine translation is an exciting employment possibility for translators—those people gifted in more than one language and with the ability to write well.

You may be more familiar with CAT, computer-aided translation. To aid in the usage of CAT, companies are approaching translation in stages. First a glossary, or vocabulary, of the most common technical terms used by that company for foreign translation is drawn up for the translators as well as for other writers. This glossary is entered into the database, followed by, for example, a page of a manual. This is pre-edited and then applied to the glossary. Words in the original piece of work are now transformed by the glossary, or *glossarized*, and the piece of writing is returned to the translator for its completion and final editing. Of course, this is an oversimplification of the process, but it may provide you with some idea of what is meant by CAT and machine translation. This development is by no means foolproof, but it does show the direction translation efforts are taking.

Systems of oral dictation to the computer also are being developed for translation purposes. Eventually, words spoken in one language may be computer processed and translated into another.

Computer Documentation

Computers are certainly no longer novel, but their increased use in every area has presented a challenge for the technical writer to produce clear and usable computer-related documents. Lack of adequate documentation, that is, the written form of all the available information about a particular computer, computer program, or set of programs, is a major problem in modern industry. Documenta-

tion in its many forms, such as operating instructions, troubleshooting and repairs, user guides, and so forth, is essential for management information on systems development and for proper coordination of subsequent phases of systems development and use. This documentation is often not thorough, nor is it done at the same time that the system is developed. Sometimes it is never done at all. The technical writer must be able to step into the complex documentation process and quickly and accurately prepare such forms as the job run manual, the job control language manual, the balancing and control manual, the key processing manual, and the job scheduling manual.

Obviously, special training is necessary for the technical writer to function effectively in preparing systems documentation. Some schools offer training programs that train technical writers for the computer industry. Most such programs offer computer science courses and training in writing operating instructions and programming reference manuals. This is just the beginning of the experience a technical writer must accumulate to function effectively in the area of systems documentation.

Many technical writers today are deeply involved in computer programming and able to analyze databases, while they are also familiar with software psychology, human factors, and ergometrics (the study of the ability of humans to adjust to their environment). The preparation of manuals for people unfamiliar with data processing and programming is a continuation of what has long been a major role of the technical writer, bridging the information gap between the technical and the nontechnical person.

Some professionals feel that technical writers are well suited for program design because they are best qualified to design the information package for the beginning user. For instance, IBM hires

technical writers to produce user manuals for their personal computers. The writer must learn what kinds of documents best fit the needs of the home computer buyer and what form would be best for these documents. This may require analyzing existing documents, interviewing users and designers, and generally converting technical and highly specialized language to language that the nonspecialist can understand.

Looking Ahead

The need for technical writers should remain steady because technical writing is not a routine job. As you have seen, new developments in communication are continually occurring, and it is widely accepted by industry that communication is the pipeline to global business.

You now know about the training and qualifications you'll need to pursue a career in technical communications and the many areas in which you might find work. If this is the profession that interests you, be confident that the opportunities are there for a serious, well-trained technical writer.

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Appendix

Professional Associations

Following is a list of associations that serve the field of technical communication.

Society for Technical Communication

The official society of the technical writing profession is the Society for Technical Communication (STC). Members have opportunities to exchange ideas, express their views, and utilize programs that benefit them in the advancement of their careers. Some regional chapters have been very active in their industrial communities in bringing business and education together, presenting important speakers, and developing writing workshops.

Whether you are a student or a practicing technical writer, you should plan to attend the annual conferences of the Society for Technical Communication, which is held each spring in various locations around the country. Conferences generally attract thousands of members and feature speakers from around the world. Presentations are made on every aspect of the profession, and you will

have the opportunity to learn firsthand from experienced technical communicators.

For complete information on membership and other society information, contact:

Society for Technical Communication
901 N. Stuart St., Ste. 904
Arlington, VA 22203
www.stc.org

Other Professional Associations

There are a number of professional societies devoted to more specialized forms of technical communication, as well as others that cover more general aspects of education.

Accrediting Council on Education in Journalism and Mass Communications
Stauffer-Flint Hall
1435 Jayhawk Blvd.
Lawrence, KS 66045-7575
www2.ku.edu/~acejmc

American Advertising Federation
1101 Vermont Ave. NW, Ste. 500
Washington, DC 20005-6306
www.aaf.org

American Agricultural Editors Association
P.O. Box 156
New Prague, MN 56071
www.ageditors.com

American Association for the Advancement of Science
1200 New York Ave. NW
Washington, DC 20005
www.aaas.org

American Association of Advertising Agencies
405 Lexington Ave., 18th Fl.
New York, NY 10174-1801
www.aaaa.org

American Chemical Society
1155 16th St. NW
Washington, DC 20036
www.chemistry.org

American Medical Writers' Association
40 W. Gude Dr., Ste. 101
Rockville, MD 20850-1192
www.amwa.org

American Society of Indexers
10200 W. 44th Ave., Ste. 304
Wheat Ridge, CO 80033
www.asindexing.org

American Society for Information Science and Technology
1320 Fenwick La., Ste. 510
Silver Spring, MD 20910
www.asis.org

American Society of Journalists and Authors Inc.
1501 Broadway, Ste. 302
New York, NY 10036
www.asjamail.org

American Society for Training and Development
1640 King St., Box 1443
Alexandria, VA 22313-2043
www.astd.org

American Translators Association
225 Reinekers La., Ste. 590
Alexandria, VA 22314
www.atanet.org

Association of American Publishers
50 F St. NW, 4th Fl.
Washington, DC 20001
www.publishers.org

Association for Business Communication
P.O. Box 6143
Nacogdoches, TX 75962-0001
www.businesscommunication.org

Association for Computing Machinery's Special Interest Group on the Design of Communication
2 Penn Plaza, Ste. 701
New York, NY 10121-0721
acmhelp@acm.org
www.sigdoc.org

Association for Educational Communications and Technology
1800 N. Stonelake Dr., Ste. 2
Bloomington, IN 47404
www.aect.org

Association of Teachers of Technical Writing
http://cms.english.ttu.edu/attw

Association for Women in Communications
3337 Duke St.
Alexandria, VA 22314
www.womcom.org

Authors Guild Inc.
31 E. 32nd St., 7th Fl.
New York, NY 10016
www.authorsguild.org

Canadian Association of Journalists
Algonquin College
1385 Woodroffe Ave., B224
Ottawa, ON K2G 1V8
www.caj.ca

Canadian Association of Teachers of Technical Writing
http://cattw-acprts.mcgill.ca

Canadian Authors Association
www.canauthors.org

Canadian Science Writers' Association
P.O. Box 75, Station A
Toronto, ON M5W 1A2
www.sciencewriters.ca

Council for the Advancement of Science Writing
P.O. Box 910
Hedgesville, WV 25427
www.casw.org

Council for Programs in Technical and Scientific Communication
www.cptsc.org

Council of Science Editors
CSE Headquarters
c/o Drohan Management Group
12100 Sunset Hills Rd., Ste. 130
Reston, VA 20190
www.councilscienceeditors.org

Dow Jones Newspaper Fund
4300 Route One North
South Brunswick, NJ 08852
http://djnewspaperfund.dowjones.com/fund

Editorial Freelancers Association
71 W. 23rd St., 4th Fl.
New York, NY 10010
www.the-efa.org

Health and Sciences Communications Association
39 Wedgewood Dr., Ste. 1A
Jewett City, CT 06351
www.hesca.org

Human Factors and Ergonomics Society
P.O. Box 1369
Santa Monica, CA 90406-1369
www.hfes.org

IEEE Professional Communication Society
http://ieeexplore.ieee.org/iel5/47/29409/01331587.pdf

Institute of Electrical and Electronics Engineers
445 Hoes La.
Piscataway, NJ 08854-4141
www.ieee.org

International Digital Enterprise Alliance
IDEAlliance
1421 Prince St., Ste. 230
Alexandria, VA 22314-2805
www.idealliance.org

International Federation of Agricultural Journalists
www.ifaj.org

International Society of Logistics
8100 Professional Pl., Ste. 111
Hyattsville, MD 20785
www.sole.org

Literary Translators Association of Canada
LB 631 Concordia University
1455, Blvd. de Maisonneuve ouest
Montreal, QC H3G 1M8
www.attlc-ltac.org

Magazine Publishers of America
810 7th Ave., 24th Fl.
New York, NY 10019
www.magazine.org

National Association of Black Journalists
8701-A Adelphi Rd.
Adelphi, MD 20783-1716
www.nabj.org

National Association of Government Communicators
201 Park Washington Ct.
Falls Church, VA 22046-4527
www.nagc.com

National Association of Hispanic Journalists
1000 National Press Bldg.
529 14th St. NW
Washington, DC 20045-2001
www.nahj.org

National Association of Home and Workshop Writers
www.nahww.org

National Association of Science Writers
P.O. Box 890
Hedgesville, WV 25427
www.nasw.org

National Council of Teachers of English
1111 W. Kenyon Rd.
Urbana, IL 61801-1096
www.ncte.org

National Federation of Press Women
P.O. Box 5556
Arlington, VA 22205
www.nfpw.org

National Writers Union
113 University Pl., 6th Fl.
New York, NY 10003
www.nwu.org

The Newspaper Guild
501 3rd St. NW
Washington, DC 20001-2797
www.newsguild.org

Professional Writers Association of Canada
215 Spadina Ave., Ste. 123
Toronto, ON M5T 2C7
www.pwac.ca

Public Relations Society of America
33 Maiden La., 11th Fl.
New York, NY 10038-5150
www.prsa.org

Science Fiction and Fantasy Writers of America
P.O. Box 877
Chestertown, MD 21620
www.sfwa.org

Society of Professional Journalists
Eugene S. Pulliam National Journalism Center
3909 N. Meridian St.
Indianapolis, IN 46208
www.spj.org

Usability Professional's Association
140 N. Bloomingdale Rd.
Bloomingdale, IL 60108-1017
www.upassoc.org

Writers Guild of Canada
366 Adelaide St. W, Ste. 401
Toronto, ON M5V 1R9
www.wgc.ca

Recommended Reading

The following are some suggestions for additional reading on the profession of technical communication.

Society for Technical Communication Publications

Intercom, the Society for Technical Communication (STC) magazine, provides various examples and applications of technical communication that will promote readers' professional development. It includes articles on new tools and technologies, columns edited by technical communications experts, society news, and a calendar of industry-related events. It is published ten times a year and is free with membership.

Technical Communication, the STC journal, publishes articles about the practical application of technical communication theory and serves as a common arena for discussion among practitioners. It includes quantitative and qualitative research, as well as book

reviews. The journal is published quarterly and is free with society membership.

Proceedings comprises more than two hundred papers given at the annual STC conference's educational presentations, known as "technical sessions." Your conference registration includes one copy of that year's *Proceedings*.

The "Business of Technical Communication" is a monthly online column that covers the business aspects of the profession. Articles discuss such areas as employment, salaries, job search techniques, and marketable skills.

The STC also publishes several informational brochures that are geared toward explaining and promoting membership. They can be purchased from regional chapters.

Journals and Periodicals

This is a short list of periodicals that are most likely to feature articles of interest to the technical communicator. You may find additional publications at your public or school library. A list of current articles also should be available. Consult a librarian for sources.

American Medical Writers' Association Journal
AMWA
www.amwa.org

Business Communication Quarterly
Sage Publications
www.bcq.sagepub.com

College English
National Council of Teachers of English
www.ncte.org/pubs/journals/ce

Editor and Publisher
VNU Business Publications
www.editorandpublisher.com

IEEE Transactions on Professional Communication
Institute of Electrical and Electronics Engineers
www.ieeexplore.ieee.org/xpl

Journal of Business Communication
Sage Publications
www.job.sagepub.com

Journal of Technical Writing and Communication
Baywood Publishing Co.
www.baywood.com/journals/PreviewJournals.asp?Id=0047-2816

Library Journal
Reed Business Information
www.libraryjournal.com

Publisher's Weekly
Reed Business Information
www.publishersweekly.com

Technology Review
Massachusetts Institute of Technology
www.technologyreview.com

Writer's Digest
F and W Publications
www.writersdigest.com

Books

Alred, Gerald J. et al. *Handbook of Technical Writing*, 8th ed. New York: St. Martin's Press, 2006.

Ament, Kurt. *Single Sourcing: Building Modular Documentation*. Berkshire, United Kingdom: Noyes Publications, 2002.

American Medical Association Manual of Style: A Guide for Authors and Editors. Philadelphia: Lippincott Williams & Wilkins, 1998.

Anderson, Paul V. *Technical Communication: A Reader-Centered Approach*, 6th ed. Belmont, Calif.: Heinle, 2006.

Beer, David F., ed. *Writing and Speaking in the Technology Professions: A Practical Guide*, 2nd ed. New York: Wiley-IEEE, 2003.

Bennett, Scott. *The Elements of Résumé Style: Essential Rules and Eye-Opening Advice for Writing Résumés and Cover Letters that Work.* New York: AMACOM/American Management Association, 2005.

Blum, Deborah et al. *A Field Guide for Science Writers: The Official Guide of the National Association of Science Writers*, 2nd ed. New York: Oxford University Press, 2005.

Bly, Robert W. *Careers for Writers and Others Who Have a Way with Words*, 2nd ed. New York: McGraw-Hill, 2003.

Brasseur, Lee E. *Visualizing Technical Information: A Cultural Critique*. Amityville, N.Y.: Bayville Publishing, 2003.

Bridgeford, Tracy. *Innovative Approaches Teaching Technical Communication*. Salt Lake City: University of Utah Press, 2004.

Burnett, E. *Technical Communication*, 6th ed. Belmont, Calif.: Heinle, 2004.

Camenson, Blythe. *Great Jobs for Communications Majors*, 2nd ed. New York: McGraw-Hill, 2001.

Carlson, Mim. *Winning Grants, Step by Step*, 2nd ed. San Francisco: Jossey-Bass, 2002.

The Chicago Manual of Style. Chicago: University of Chicago Press, 2003.

Coghill, Anne M., and Lorrin R. Garson, eds. *The ACS Style Guide: Effective Communication of Scientific Information*, 3rd ed. Washington, DC: American Chemical Society, 2006.

DeGalan, Julie, and Stephen Lambert. *Great Jobs for English Majors*, 3rd ed. New York: McGraw-Hill, 2006.

Dubinsky, James M. *Teaching Technical Communication: Critical Issues for the Classroom*. New York: Bedford/St. Martin's, 2004.

Goodman, Neville W., and Martin B. Edwards. *Medical Writing: A Prescription for Clarity*, 3rd ed. New York: Cambridge University Press, 2006.

Hancock, Elise. *Ideas into Words: Mastering the Craft of Science Writing.* Baltimore: Johns Hopkins University Press, 2003.

Hargis, Gretchen, et al. *Developing Quality Technical Information: A Handbook for Writers and Editors*, 2nd ed. Lebanon, Ind.: IBM Press, 2004.

Harty, Kevin J. *Strategies for Business and Technical Writing*, 5th ed. Boston: Longman, 2004.

Harvard Business Essentials. *Business Communication*. Cambridge, Mass.: Harvard Business School Press, 2003.

Herrington, TyAnna K. *A Legal Primer for the Digital Age*. Boston: Longman, 2003.

Hirsch, Herbert. *Effective Communication Strategies*, 2nd ed. New York: Wiley-IEEE Press, 2002.

Johnson-Eilola, Johndan, and Stuart A. Selber, eds. *Central Works in Technical Communication*. New York: Oxford University Press, 2004.

Kynell-Hunt, Teresa, and Gerald J. Savage, eds. *Power and Legitimacy in Technical Communication: Strategies for Professional Status*. Amityville, N.Y.: Bayville Publishing Co., 2004.

Lipson, Charles. *Cite Right: A Quick Guide to Citation Styles—MLA, APA, Chicago, the Sciences, Professions, and More*. Chicago: University of Chicago Press, 2006.

Matthews, Clifford. *A Guide to Presenting Technical Information: Effective Graphic Communication*. New York: Wiley, 2005.

Microsoft Manual of Style for Technical Publications, 3rd ed. Microsoft Press, 2003.

Mirel, Barbara, and Rachel Spilka, eds. *Reshaping Technical Communication: New Directions and Challenges for the 21st Century*. Mahwah, N.J.: Lawrence Erlbaum Associates, 2002.

Montgomery, Scott L. *The Chicago Guide to Communicating Science*. Chicago: University of Chicago Press, 2002.

Munger, Roger. *Document-Based Cases for Technical Communication*. New York: Bedford/St. Martin's, 2004.

New, Cheryl C., and James A. Quick. *How to Write a Grant Proposal*. New York: Wiley, 2003.

Oliver, Vicky. *301 Answers to Tough Interview Questions*. Naperville, Ill.: Sourcebooks, 2005.

Pfeiffer, William S. *Technical Communication: A Practical Approach*, 6th ed. Upper Saddle River, N.J.: Prentice Hall, 2005.

Pringle, Alan S., and Sarah S. O'Keefe. *Technical Writing 101: A Real-World Guide to Planning and Writing Technical Documentation*, 2nd ed. Research Triangle Park, N.C.: Scriptorium Press, 2003.

Reep, Diana C. *Technical Writing: Principles, Strategies, and Readings*, 5th ed. Boston: Longman, 2002.

Reinking, James A., et al. *Strategies for Successful Writing with 2001 APA Guidelines*, 6th ed. Upper Saddle River, N.J.: Prentice Hall, 2002.

Rosenberg, Arthur D., and David V. Hizer. *The Résumé Handbook: How to Write Outstanding Résumés and Cover Letters for Every Situation*, 4th ed. Cincinnati: Adams Media Corp., 2003.

Rosenberg, Barry. *Spring into Technical Writing for Engineers and Scientists*. Upper Saddle River, N.J.: Addison-Wesley Professional, 2005.

Rubens, Philip. *Science and Technical Writing: A Manual of Style*, 2nd ed. New York: Routledge, 2000.

Rude, Carolyn D. *Technical Editing*, 4th ed. Boston: Longman, 2005.

Simons, Warren, and Rose Curtis. *The Résumé.com Guide to Writing Unbeatable Résumés*. New York: McGraw-Hill, 2004.

Sun Technical Publications. *Read Me First! A Style Guide for the Computer Industry*, 2nd ed. Upper Saddle River, N.J.: Prentice Hall, 2003.

Taylor, Alan, and James R. Parish. *Career Opportunities in Writing*. New York: Checkmark Books, 2006.

Van Wicklen, Janet. *The Tech Writer's Survival Guide: A Comprehensive Handbook for Aspiring Technical Writers*, 2nd ed. New York: Checkmark Books, 2001.

Weiss, Edmond H. *The Elements of International English Style: A Guide to Writing Correspondence, Reports, Technical Documents, and Internet Pages for a Global Audience*. Armonk, N.Y.: M. E. Sharpe, 2005.

Wysocki, Anne. *Writing New Media*. Salt Lake City: University of Utah Press, 2004.

Young, Matt. *The Technical Writer's Handbook: Writing with Style and Clarity*, 2nd ed. Herndon, Vir.: University Science Books, 2002.

Zobel, Justin. *Writing for Computer Science*, 2nd ed. New York: Springer, 2004.