

Technical Writing As a Tool — An Art

By Jim Wood

Editor's Note: Amen!

The need for high quality in research papers has never been more evident than in today's fast-paced, complex technological age. Our minds boggle from the accelerating expansion of research and all the publications resulting from it. The practicing scientist, manager, or administrator has only limited time to keep abreast of the voluminous literature. His problems multiply and intensify when that literature is verbose, vague, and boring. He deserves to read articles that are technically sound, informative, well-organized, and a pleasure to read. He must be able to grasp information and ideas at a single reading, without having to re-read sentences or puzzle over ambiguities.

Although I believe the writing of many NPS scientists is of high quality, as an editor I have seen no manuscripts that could not be polished and improved. Some have been prepared so poorly and in such careless, sloppy language that they fell far short of the high standards on which the Service must insist. It was impossible to judge their scientific worth until they were translated into reasonably acceptable English.

Some of the best (and some of the poorest) written English I have seen is the work of technical men and women — biologists, geologists, social scientists. Technical writers, whether they realize it or not, start with an advantage. Their basic material is concrete facts and events. Their main object is to describe such and show the relationships between them.

In my judgment, the best technical writing is being done by persons at the top of their professions. They have done important work, understand its meaning, and write about it with confidence. They are bold and sure enough to write simple, direct English.

Too many others, who lack experience and assurance, tend to write with an uneasiness that leads to fog. They smother their meaning in qualification and jargon. Still others are so engrossed in their work that its "special language" has become second nature to them. They overlook how awkward and puzzling this gobbledygook can become when allowed to clot on paper. The scientist who is sure of himself includes, of course, qualification and specialized technical terms when required. But he also recognizes the surplus that can be safely shed. This is an important part of wisdom and essential to clear communication.

I find it ironic that:

1. Most scientists do very well in oral communication, talk simply and

clearly, and can explain to a layman what they are doing. But once they begin to write they shun simple English and slip into an odd jargon they consider "traditional" and "safe." They are afraid that if they did otherwise, their writing might seem "unprofessional." It is *never* unprofessional in the sciences to make oneself clear!

2. Although many technical and professional people are poor writers, they read no better and are no less confused by fog than laymen. This is easy to judge from the lively oral discussions often printed following the scientific papers of technical meetings. Many scientists habitually skim the articles, then read closely the oral discussions!

All the foregoing doesn't mean scientists should write their reports for grade-schoolers. Neither should they write their papers as "all things to all people." What I want to emphasize is — *any piece of writing should revolve around the intended reader.* The report should be related to the reader's experience. It should prepare him for what he is about to read. It should be presented in a rational, logical manner and enable him to gain facts and their relationships in the shortest possible time.

Any scientist who writes a paper has spent time gathering facts and contemplating their meaning. The interpretation of meaning is usually the most important part of the paper. The author owes it to the reader to make clear the meaning he has been able to draw from the facts — *without* neglecting to underline points that are still unclear or unsolved. This is especially important for scientists working for public land management agencies like the National Park Service — they have a clear obligation to park managers charged with the stewardship of these lands.

When a scientist writes for those outside his field he should take care to avoid or explain technical terms that are not commonly familiar. In writing for people within his own field, he should review his technical writing self-critically and ask himself: Am I using these words to express or to impress? Am I using them because they are necessary to make my ideas clear? Or am I using them merely to signal that I am an expert?

Four guidelines will help:

1. **Arrange the material logically.** Organize your writing in logical order. Don't begin your report in unknown specifics rather than familiar basics. It is much better to start with something the reader is familiar with and then one section and "meters" or "kilometers" in another. If for some reason we need to use both systems, ordinarily we give the familiar one first, then use parentheses to convert the figures into the other system.

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2. **Prefer the active voice.** Technical writers should make a special effort to avoid a monotonous series of passive constructions; active ones are shorter and more readable. Example:

PASSIVE:

The melting point of the alloy was lowered 50 degrees by adding 10 per cent of aluminum.

ACTIVE:

Adding 10 per cent of aluminum lowered the melting point 50 degrees.

3. **Don't make nouns out of good, strong "working verbs."** Making nouns out of verbs tends to smother the meaning of sentences. Example:

SMOTHERED:

Authorization must be received from the Research Director before utilization of new methods can be incorporated in this project.

IMPROVED:

The Research Director must authorize new methods before they are used in this project.

(Why not "utilize"? Isn't that the verb form of "utilization"? Yes, it is. But "use" is shorter, crisper, and less stuffy.)

The main trouble with smothered verbs is this: anytime you change a working verb to a noun, you must add another verb to complete the sentence. Also, you can see from the above examples that smothered verbs and passive constructions frequently go together. In fact, they are almost inseparable. If you can "unsmother" a verb and, at the same time, change a passive to an active construction, you'll cut sentence length by a third and increase the chance for interest and understanding.

4. **Be concise — cut out excess baggage.** Technical writers should strive to eliminate unnecessary complexity by reducing sentence length. Example:

ORIGINAL:

Comparison of data obtained with these paints using Barco with those using Lenol revealed that use of Barco solvent slowed the drying appreciably (approximately doubling the time in most instances) but had very little effect on the viscosity characteristics obtained.

REVISION:

The data showed paints using Barco were no more viscous than those using Lenol, but dried only about half as fast.

The above guidelines do not cover every possible "poor writing" situation — just a few of the more common ones. For those who wish to learn more, I suggest this paperback: *Writing with Precision* by Jefferson D. Bates. Published by Acropolis Books, Ltd., Washington, D.C. 20009; \$6.95

per copy.

In these days, more than ever before, the reading time of a scientist is precious. Few of them like the task of writing. But writing is the chief means (and permanent record) of handing on what they have learned.

Remember — write for the reader, not the filing cabinet! And most of all, write to *inform* — not to prove that you're smarter than your readers!

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