

EDITORIAL

THERAPY FOR DEBILITATED SELF-EXPRESSION: OR, HOW TO WRITE AND MAKE SENSE

ALL of us know that it has become important for scientists to be able to talk to the general public, whether the scientists like it or not. The final confirmation came when the American Medical Association hired a public relations firm and started sending out press releases, just like M-G-M. But we are not concerned here with how to say things simply for popular consumption. A more important problem, it seems to me, is that of scientists being able to communicate clearly and effectively with each other. There are cases every day where scientific knowledge suffers, where research is handicapped, because of the way somebody wrote down what he had to say. In some places they are tackling the problem directly.

A bright ex-student of mine who took his master's degree in journalism a few years ago is now working for a firm which does extraordinarily complex research in missiles. His job is to help researchers prepare reports—not for popular consumption, not even for the men in the Pentagon who pay the bills, but *for each other*. He helps scientists write confidential memoranda, in effect, for other scientists down the hall. He was, I repeat, a journalism major; he had no scientific training, and he tells me that he still doesn't know what most of the big words mean. But he knows how to communicate; he thinks sharply and clearly. He is paid well by the company and taken out for coffee often by the scientists.

We are concerned here with anesthesiologists talking to other anesthesiologists: the stuff that is loosely and inaccurately called "medical" writing. Since all of us like to feel like frontiersmen of the intellect, I wish I could let you in on some sensational new, easy, revolutionary technique that would solve all your writing problems. I cannot. There's some solid research going on in communications, but we're at about the stage your specialty reached with W. T. G. Morton or Crawford Long. I suggest that you request a paper from a communications specialist about twenty-five years from now. He may have some startling things to say.

I won't. I shall have to deal with a few eternal verities which have been staples for teachers of writing since Aristotle, in one form or an-

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other. This time, suppose we put them in the form of four questions which every writer of medical articles—or any kind of articles, for that matter—ought to ask himself before he starts writing. If he can answer these questions clearly and concisely, he's well on his way.

The first question is this: *what's it really about?* It's not enough to answer "why, it's about this new piece of apparatus"; that gets us nowhere, and it's reminiscent of those high-school English teachers who assign essays on "motherhood" or "the flag." But if the writer goes further and says to himself "it's about the way this new piece of apparatus performs under certain conditions," the planning of the piece is much ahead. This means that the article will not be about earlier pieces of apparatus which behaved poorly, unless there's some directly relevant factor in the reasons for their failure. The article will not be about the problems the instrument maker had in machining the valves, and will contain no digressions about high-temper alloys, even though the writer fancies himself as something of a metallurgist. It means that, if there's a familiar drug used in the experiment, the drug will be discussed only if it has a unique relationship to the conditions imposed by the apparatus; no little lectures on general pharmacology. Incidentally, the same standard applies to illustrations as well as text; photographs which show something consequential about the apparatus belong in, by all means, but photographs which are included just because they came out well do not.

This kind of sharp-edged answer to the question "what's it really about?" cuts down a lot of bulk. There's a great glow of satisfaction, we all know, when you have to use six or even nine cents postage to send a reprint to a colleague. But the reader is bored, at best, by wandering and digressive writing which is not about the subject in point; more commonly, and more seriously, he is confused or misled.

All this is very elementary, of course, and I would be embarrassed to bring it up except for the fact that manuscripts with this basic flaw are received every week in the offices of ANESTHESIOLOGY—and, without doubt, in the offices of *The Journal of Pharmacology and Experimental Therapeutics* and the *Archives of Surgery* and the *American Funeral Director* as well. Two manuscripts submitted to ANESTHESIOLOGY in the last few months come to mind. One, which was published, dealt basically with a kind of statistical review of several hundred cases in which an experimental surgical technique was used. It was apparently the first time the material from all these cases had been pulled together, and it added up to a massive amount of very informative stuff. But the author had done a little research in this kind of operation himself, and he couldn't resist dragging in as a kind of afterpiece some tentative observations about a particular drug he had been testing. The drug had not been mentioned in the main part of the article; it did not enter into the statistical summary of cases at all.

What the author had, of course, was two articles; one concerning

the figures on the several hundred cases, and one about his own research, assuming it was significant enough to stand by itself. The piece as it was offered, however, was as illogical as an analysis of the frequency of traffic accidents in the United States concluded by an account of how the author had almost had one on his way to the office the other day.

While we're on the subject of traffic accidents, that's what the other manuscript to which I referred was about. There were grounds to suspect that this was a writing assignment forced upon the author by his membership in a medical team devoted to investigating all aspects of the problem, with the understanding that when the project was finished everybody was going to write a paper about traffic accidents and his own specialty, come hell or high water. This may not have been the case, but the whole piece had a strained tone which indicated it had been done under duress. The author's problem lay in the fact that there seem to be no unique implications for the anesthesiologist in the fact that a surgical patient was banged up in an automobile crash as distinguished from, for example, an industrial accident. The author gave it a good try, but he was in a position rather like contending that an appendectomy performed by a surgeon in a green apron is a different operation from one performed by a man in white.

If the author of the first manuscript mentioned had asked himself the question "what's it really about?", he would have had to answer "it's about the implications of information now available from several hundred case reports on this new technique," and he would have postponed the observations on his own research to a later article. If the writer who wrote about anesthesiology and traffic victims had asked himself "what's it really about?", he would have had to answer "It's about something that doesn't exist," thus saving himself the aggravation of reading a letter of rejection.

The second of the four questions which every writer should ask himself—"what am I trying to say about it?"—is most directly related to organization. The word "organization" was a favorite of the ladies who taught us all freshman composition, and you may still remember models of organization—model outlines to fit any subject matter. There are some model outlines for "scientific" articles; probably the most familiar is the one that begins with the bald subhead "statement of the problem" and a couple of paragraphs later has an even balder one, "history." Actually, forcing the strait-jacket of an all-purpose outline on your material may get in the way of what you want to say. A good outline—or, better, let's call it a good structure—is organically related to the material.

To continue with the hypothetical writer of the article about a new piece of apparatus: having answered the first question, "what's it really about?", he now asks himself the second: "what am I trying to say about it?" If he answers "I want to say that, in the main, it

works, although there are a couple of drawbacks," the organization of the article is almost automatic. He's going to start out by saying that a familiar problem is now close to a solution because of a new piece of apparatus. He's going to describe the apparatus. He's then going to prove that it works, by a listing of its virtues and an account of its performance under test conditions. He will then mention the problems which remain to be worked out and indicate the probable direction of the solutions. He will then write his summary and quit.

Once you know what you're writing about, and what you want to say about it, the process of structuring the article becomes almost as simple as sorting lengths of lumber. The pieces that are the right size—the ideas and the chunks of material which fit—you save; the rest you discard. If your research has led you into an examination of related literature and you've found some interesting bits and pieces of stuff which are almost, but not quite, directly connected with what you have to say, be firm and discard them. If the surgeon has been trying something different in the cases you're writing about, but without affecting the anesthesiological procedure in any way, resist the temptation to digress. If it does not fit the purpose defined by the answer to "what am I trying to say about it?", it shouldn't be used. Besides, the surgeon is probably planning ways to pad it enough to write an article himself.

Again, we are dealing here with a notion so simple that it would be naïve to bring it up if there weren't so many bad examples appearing constantly in specialized journals. Perhaps the quickest way to check the structure of an article, either as author or reader, is by the summary. The summary of a well-put-together article should almost write itself. If, as author, you find it slow and difficult going, the trouble probably lies in the definition of the topic (what it's really about) or the selection of material (what you're trying to say about it). The cure does not lie in trying to write another summary; it lies in rethinking the article. Observe I did not say rewriting the article, I said rethinking.

Question three: *who is it for?* (Never mind the grammar; ours is a resilient language; it can take a certain amount of violence for the sake of emphasis.)

Every publication, regardless of how specialized, has a variety of backgrounds and levels of understanding represented among its readers. Commercial magazines with mass circulation go to great expense to get an accurate picture of their audiences, but the scientific publication has seldom bothered. Expense is a factor, of course, but there have been other reasons. Thirty years ago most scientific publications had a much narrower subject matter than they have today; the audience was defined by the fact that the magazine was for everybody interested in bacteriology, or whatever the subject might be. I suspect every article in the first few issues of ANESTHESIOLOGY, your own jour-

nal, could be understood and used without difficulty by almost every member of the Society. As you well know, this is no longer the case. Scientific knowledge has exploded in a kind of geometric progression; subspecialties develop in what were once considered very narrow specialties in themselves. Today, an anesthesiologist who is interested most in respiration may find the schematic diagrams of molecular structure of the pharmacologist-anesthesiologist somewhat confusing. And the reader whose job is standardized clinical practice in a small hospital may find that neither of them writes articles intelligible to him. Subject matter has grown, and both the number and variety of readers have grown with it.

You still will have to answer the question, however: who's it for? You may well decide that it's for the fifteen percent—or even five percent—who have, say, an elaborate background in biochemistry. Then write it for them. You have neither the room nor the time to teach biochemistry in your article, even if it would be nice to enlarge the audience. Write it for the people to whom it will have meaning. The editors will then have to decide whether or not they want to carry material which appeals to only a small section of the audience, but that's their problem, not yours.

Similarly, you should write the clinical article for the man who wants useable information. The meticulous, straight-forward clinical report can be a real contribution. It does not need apologies. Nor does it need to be hooked up with a pseudo-profound tone in the attempt to make it what it's not. The reader who has little interest in things clinical won't be deceived for long, and the readers who are your real audience will be irritated.

We might add a footnote: it seems to me that occasionally you might change the question to "*what's it for?*" and give yourself the answer "For the Current Comment section of ANESTHESIOLOGY." There are many items of interest in the specialty which simply do not have the intellectual dimensions of a regular article. The writer's recognition of this will save trouble for both him and the editor of the Current Comment section.

The astute may have noticed that, although this discussion has been underway for some time, there still has been no discussion of writing *per se*, of the process of putting words on paper. We have been talking about thinking, and this is as it should be. Make no mistake: in any specialty, good creative work is done with the head, not the fingers. There is a wonderful little remark attributed—quite incorrectly, I suppose—to Moliere. Supposedly a lady once asked him how his new play was coming along, and he replied: "Splendidly, madam; it is almost finished. All I have to do now is put down the words."

Even so, there is a fourth question which the writer of a medical article might well ask himself: "*shall I write it in English?*" The

answer, it is to be hoped, will always be “yes,” but the reader may not realize it from the end product.

The world is full of witty abuse about the way doctors—and scientists in general—write. I shall forego the pleasure of contributing more. In the first place, some of the carping is unjustified. For example, any specialty has a right to a certain language of its own in naming things and processes. Saying a “compound fracture of the tibia” instead of a “badly broken leg” is an effort to be more precise, not more obscure. Only a few super-purists who worry about such things as mixing Latin and Greek forms actually quarrel about nomenclature.

The real difficulty lies in the belief that there is something called “medical writing” or “technical writing” or “scholarly writing.” If there are such things, there also must be “anesthesiological writing” and “extruded metals writing” and “home economics writing.” This is nonsense, of course. There is writing about things medical; there is writing about technical subjects, and there is writing about extruded metals and home economics. This might seem to be a pretty trivial point, a quarrel about making a noun into an adjective.

The point is not trivial, however, because most doctors apparently believe there is a special prose style for their trade. Apparently it calls for the diligent searching out of the most cumbersome way to say things. A section chief at a medical school I know had to write a note asking the residents on duty to stick a little closer to the phone. It wasn't for publication, but it was going to be pasted to the wall. This apparently brought out the medical writer in him, because he wrote:

“It is imperative that residents maintain themselves in a position to respond instantly to a summons by telephone.”

Observe particularly the phrase “it is . . .” which is very important in all soundly obscure medical writing. Things almost never happen directly (or in the active voice, as a grammarian would say); oxygen does not combine with hydrogen to make water in medical writing; instead, *it is to be observed* that the combination of oxygen and hydrogen produces water.

You might go through the first draft of your next article, underline all the “it is” phrases in red, and see what you can do about them. One of the things you can do is write in the first person, as this paper is written; since most scientific material these days is done in collaboration, you can use the modest pronoun “we” and not appear too vain. There is something much easier in reading the phrase, “On the basis of the experiment, we believe . . .” instead of, “On the basis of the experiment, it is believed that. . .” The former version is also more accurate.

The omni-present “it is” is only one of many characteristics of stiff scientific writing; not only is there no room here to talk about more, but there would be little sense in it. Trying to improve written style

by picking at phrases is like treating acne a pimple at a time. The real problem is a matter of the frame of mind.

When you write, you are writing about your work. Very well, the fundamental rule is simple: keep the work in mind, not the process of writing. Don't try to sound like a fuzzy echo of a thousand badly-written articles produced by men who, if they were as self-conscious in their investigative techniques as they were in putting words on paper, never would have found the door to the laboratory.

A final illustration: I once collaborated on a book with a man who, while not a scientist, was a highly-developed technician of a sort. He had a contract to write a textbook about his specialty. By the time the manuscript was three-fourths finished, he was in a panic. He asked if I would take on the job of rewriting it for a share of the proceeds. Indeed, he said I could have all the proceeds, if I could just get the thing written.

I thus fell heir, for a percentage, to a small haystack of some of the worst manuscript I have ever seen. It was chewed to death by erasures; it was incredibly stiff; it sounded like an intolerably long theme by a freshman who was trying desperately to pass the course but had little hope. Three chapters remained to be written; once I assured the author that I would rewrite these, too, he hastily sketched them out in an evening. I rewrote the first three-fourths of the manuscript—but those final three chapters, “sketched out” after the author was released from the burden of impersonating a writer of textbooks, appeared in the book almost precisely as he wrote them.

Don't try to sound like a writer of medical articles. Be sure of what you're writing about, remembering that the best prose in the world will not make poor thinking better; be sure of what you want to say about it; be sure you know the audience for which you're writing it; and, finally, write it simply and directly. It is the work that is important, not the words. Even if you never win a prize for literature, you may add a new fragment to man's knowledge of the world he lives in. I cannot imagine a more important function for any writer.

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