



## Communicating science to popular and academic audiences

by Jo Whelan

“What are the differences between the writing in biomedical journal manuscripts (generally exceedingly boring) and the sort of things we read in BBC Focus, New Scientist or Scientific American (generally fascinating)?” This was my brief from the *TWS* editor, who went on to say that “more and more science journals are going in the direction of magazines because people would prefer to read something more readable than biomedical journals, which are hardly read anyway.” I can’t pretend to have any scholarly insight into this, but as a writer who has earned a crust doing both types of writing I will try and pull together a few observations.

I don’t suppose many of us read original research papers at bedtime (unless we have a really serious insomnia problem). Similarly, I imagine that few people read biomedical journals from cover to cover. Most are likely to cherry pick one or two articles that draw their interest, either from an electronic or printed table of contents or through a Medline search. The proportion of papers that get read in anything like their entirety after a glance at the abstract is likely to be smaller still. This isn’t to denigrate the writing in biomedical papers or journals. The reason they are not read from cover to cover is not that the writing is boring but because they describe many individual pieces of research, each of which, in isolation, is only of interest to a small number of people.

Would more people read original research papers if the writing was more compelling? My guess is probably not. To communicate their research to a wider audience, institutions, journals and sponsors increasingly produce press releases at the time of publication. These are placed on news services such as Medwire (<http://www.medwire-news.md/default.aspx>), AlphaGalileo (<http://www.alphagalileo.org>) and Eurekalert (<http://www.eurekalert.org/>), all of which are good sources of serious and original medical and healthcare news. They sit at the top of a whole chain of websites which feed on and digest the original stories (e.g. the BBC News site), or digest the digests. The lower down the chain, the more likely it is that a Chinese whispers effect will come into play and distort the original story, and the less reliable the data on which some of the stories are based (non-scientific surveys carried out by PR companies, for example).

*Few of us read original research papers at bedtime*

There are problems with this approach. Over-eager press officers often introduce interpretations that go beyond what is justified by the study. It appears that some authors either don’t insist on approving press releases, or else feel unable or unwilling to challenge what has been written. Alternatively, researchers may feel that it’s OK to say things in a press release that you wouldn’t say in a journal article. Press releases also offer the chance for researchers with large egos to grandstand without peer review and make inflated claims for the significance of their work.

*Is explaining research to a general audience ‘easier’?*

More serious is the situation where research findings are communicated directly to the media in the absence of a peer-reviewed publication. In his book *Bad Science* (Fourth Estate, London, 2008), Ben Goldacre describes how this was the case with several of the key scientific claims in the MMR vaccine scare in Britain. Supposedly important scientific claims “were being reported in newspapers and magazines, at meetings, in fact anywhere except proper academic journals where they could be read and carefully appraised,” Goldacre notes. He also stresses the importance of ‘publication in full’. If full details of the methods used and the data collected are not published, readers are not in a position to critically appraise the research.

From a writer’s point of view, is explaining research to a general audience ‘easier’ than writing a manuscript for an academic journal? In my experience, the answer is “no”.

*Speak to the people at the centre of the story*

Good popular science articles (ones that get the science about right and manage to tell an interesting story in the process) can be as or more challenging to write than the average academic review or clinical paper, although they don’t take as long. The writer must create a narrative that acknowledges the background issues, the different approaches, the conflicting research results and the links to other findings and ideas that make up real-life science, and then explains them to the general reader. It is this element of giving an overview of a complex subject to a non-specialist audience that is demanding, especially when the writing must be both engaging and concise as well.

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Einstein said, “If you can’t explain it simply, you don’t understand it well enough.” While Einstein-like levels of understanding are fortunately not necessary, a good grasp of the topic is.

Journalists who have written medical stories for both high-end and mass-market publications will often say that writing for the mass market is more difficult. For higher-level readers we can write in the way that we ourselves think, which is not so far removed from the way in which research is presented. Writing for the mass market requires writers to present the subject using a very different type of discourse from its source material. Similarly, the challenge of popular science writing is to translate the subject matter from its native scientific style of discourse into the narrative and stylistic requirements of the popular form.

Popular science writers must give the big picture, but can skimp on the detail – both on the page and in their own understanding. In scientific writing it’s often the detail that’s important. Unless the paper contains groundbreaking new concepts (and most don’t), we can assume a greater level of knowledge in our readers and the need for explanation and context-setting is less.

What are the differences in writing style between scientific and popular science writing? An important part of writing a science feature is interviewing. It’s not enough to search and summarise the literature, as you would for a scientific review. You need to speak to the people at the centre of the story. Editors will usually expect quotes from at least two experts, including people from opposing points of view if opinion is divided. For me this is the most rewarding part of the job; it is a tremendous privilege to be able to ring up top people in their field and get them to talk about their work. Most are happy to talk to writers from the science press. Their insights and anecdotes will usually supply most of the material you need to bring the article to life.

Popular science pieces must be written in a clear and direct style, so that any hard work by the reader comes from understanding the concepts, not fighting their way through the sentences. I think scientific writing can learn from this. Popular writing uses colourful and idiomatic language to create interest, and often adopts a semi-conversational style. For scientific writing that is not necessary or desirable. Nevertheless, the aim of scientific writing is fundamentally the same – that is, to communicate with the reader. It achieves this better if we state what we mean as simply and directly as we can. Complex language can also be a way of fudging, perhaps unconsciously, to hide the fact that we aren’t sure exactly what we mean.

Clearly, both scientific and popular writing have their place in the communication of science and medicine. Each type of writing can learn from the other. Editors who commission stories should perform the function of peer reviewers and point up flaws, ask for evidence and request clarification of arguments. Science editors will usually do this. Unfortunately the average generalist editor won’t, and the woeful results can be seen in some of the medical stories

that make the national newspapers, at least in Britain. Scientific writing can perhaps take on board the fact that readers like narrative, and can learn from journalism’s use of plain language.

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### Some emotions absent from modern scientific articles: Sand hoppers

In Cladaigh Chonamara Seosamh Mac an Iomaire, [1] an Irish fisherman in 1926 describes the sand hopper: “The tonachan tra ia always working at ebbing tide, making small holes under the sand. He raises his hard pointy head from time to time to look around and see how the labour is going. He does not live in his holes. Usually there is a huge crowd of them together, helping each other loyally and stoutly.”

The English Archdeacon W.Paley wrote in the early 19<sup>th</sup> century in *Natural Theology* [cited in 2]: “walking by the sea side, in a calm evening, on a sandy shore, with an ebbing tide, I have frequently remarked the appearance of...young Shrimps, in the act of bounding into the air from the shallow margin of the water or from the wet sand. If any motion of a mute animal could express delight, it was this; if they had meant to make signs of their happiness they could not have done it more intelligibly.”

C.M. Yonge wrote in *The Sea Shore* in 1949 the sand hopper [2], “...[it] may occur in immense numbers: “not millions but cartloads” was the comment of one observer. It burrows in sand under weed and other debris along the strand line”.

Ed Ricketts wrote in *Between Pacific Tides* in 1938 about sand hoppers; “Observers with a trace of sympathy for bohemian life should walk with a flash light along a familiar surfy beach at half tide on a quiet evening. The huge hoppers will be holding high carnival—leaping about with vast enthusiasm and pausing to wiggle their antennae over likely looking bits of flotsam seaweed [3].

A similarity in opinion between a 19<sup>th</sup> century Church of England clergyman, a Californian biologist and an Irish fisherman suggests a worldview of a fairly universal appeal. However science has conquered this universal appeal. These authors expressed feelings the animal inspired in them but feelings are absent from modern scientific articles.

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#### References:

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