

## Drama in research papers

### Denys Wheatley

Editor in Chief, *Cell Biology International*; *Cell Biology International Reports*; *Cancer Cell International*; *Oncology News*; Chairman and Director, BioMedES; Leggat, Keithhall, Inverurie, Aberdeen AB51 0LX, UK; 3232dnwd@gmail.com

Is science a theatrical business? Many would say that experimentation is down to earth, most investigations being routine and rather mundane. Drama in science does surface in the excitement that surrounds momentous occasions, such as the discovery of the double helical structure of DNA or proof that the Higg's boson exists. By contrast, some heightened emotion might arise when an unexpected result is found that questions a well-established hypothesis, or light dawns on a new hypothesis never previously considered. While scientific life might be seen as quite unemotional, there is nevertheless excitement in the creative action of research, as workers test their cherished hypotheses. This is only human, and it frequently spills over into their papers. However, this practice has been discouraged for many decades. The question is whether we should discourage it today or let authors have greater liberty to express themselves in a more emotive way. Otherwise we will find:

"there is nothing more tedious to read as a scientific paper" - Francis Crick

It is clear that some air of excitement (drama) is present in current communications. Perhaps even some humour might be tolerated, but as yet there is little evidence of it, except perhaps by subtle innuendo. In previous essays, I have ranted on about conventional primary research articles being frankly boring. An increasing use of more theatrical words and expressions can lighten the tedium somewhat. Some are here to stay, having become standard vocabulary.

Let me reveal a few of my favourite examples – well, I have just done so! I am going to *reveal* to you, not just *give* or *show* you a few examples. To reveal is more than just to show; it is to uncover something "before your very eyes" in a dramatic way, eg Poirot might say "I am now going to reveal who is the true murderer!" Everything in science today, however, is being "*revealed*". In previous articles I have dwelt a lot on choosing exactly the right word for the context, and English is rich indeed in these choices. Depending on the context, the word revealed can be correct, but another word is needed in other contexts. The less emotive words that can be used are much simpler in most research papers - to *show*, *tell*, *indicate* or *find* - each of which has its rightful place as the context demands.

But this is the tip of the iceberg. In yesteryear the parlance would be that *we experimented* on a rat, but today it has become "*we performed an experiment* on a rat", as though the researcher mounted a stage in front of an audience to carry out this "act". The same goes for "*sacrificed*", as discussed in a previous essay, and this certainly has a very emotive ring to it (where's the altar?). I have yet to read that animals were *executed*, but it could come into use! This theatricality goes much further. "Factor 8 *plays a significant role* in..." is pure theatre. This expression means "*functions, is involved in, or acts*" in some process.

Take a look at emotive words now commonplace in today's literature: *Unexpectedly*, we revealed that... Surprisingly, this did not happen...*Interestingly*, the evidence was... *Astonishingly*, we did not observe...The effect was *remarkably* elevated... *Importantly*, we noted... This procedure was shown to *dramatically* increase the level of... The images were captured with an Olympus S2 camera...At confluence, the cells were *harvested* with...The mice were *subjected to* an intravenous injection of...It will be *enormously important* to examine...*Excitedly*, simultaneous inhibition with... This treatment caused a *drastic* decrease in... Our results *display new and exciting* evidence of... *To further testify the specificity of the remarkable* effect of... Therefore we were *very keen to ameliorate our knowledge*... SNP insults induced H9c2 cell death as a dose-dependent manner... Caspase-3 is one of the *key executioners* of apoptosis... and so on (these are actual examples).

A frequent and annoying phrase in a primary research article is "We have revealed *for the first time*..." While this may be true, it conjures up a moment of real drama, the authors hailing themselves as true pioneers by making prior claim, when the whole purpose of a primary research paper is to communicate *new* findings.

Let me return to phrases mentioned earlier that abound in the literature, eg the word *perform*. I have no quibble with it when it is used in the appropriate context, but surely it is not suitable when used in almost all scientific papers. To perform connotes a quite strong element of *exhibitionism*, and is a function carried out by a person. To say that estrogen performs better than progesterone in eliciting a response from the ovary transfers the action from the investigator to the hormone when the word *is* would be shorter and perfectly adequate. You will also have seen this with the word *exhibited*, used far too liberally in almost every paper, as in eg "this cell type *exhibited* an unusual phenotype...". The simpler word "had" is preferable.

In conclusion, two issues arise. First, the examples I have given are words that are far too limited in their connotations to be used so frequently and almost exclusively, often inappropriately, and are lacking in precision - so necessary in science, no less in its communication than in its execution. And second, most of them have become so hackneyed and commonplace (ie jargon) that they have lost their force. The question is, do we editors leave these elements of drama in papers or should we weed them out and use simpler English words (back to good old Anglo-Saxon)? Whatever transpires, we ought to stop the repeated use of some of these words within the same article while also considering sensible and more appropriate alternatives.