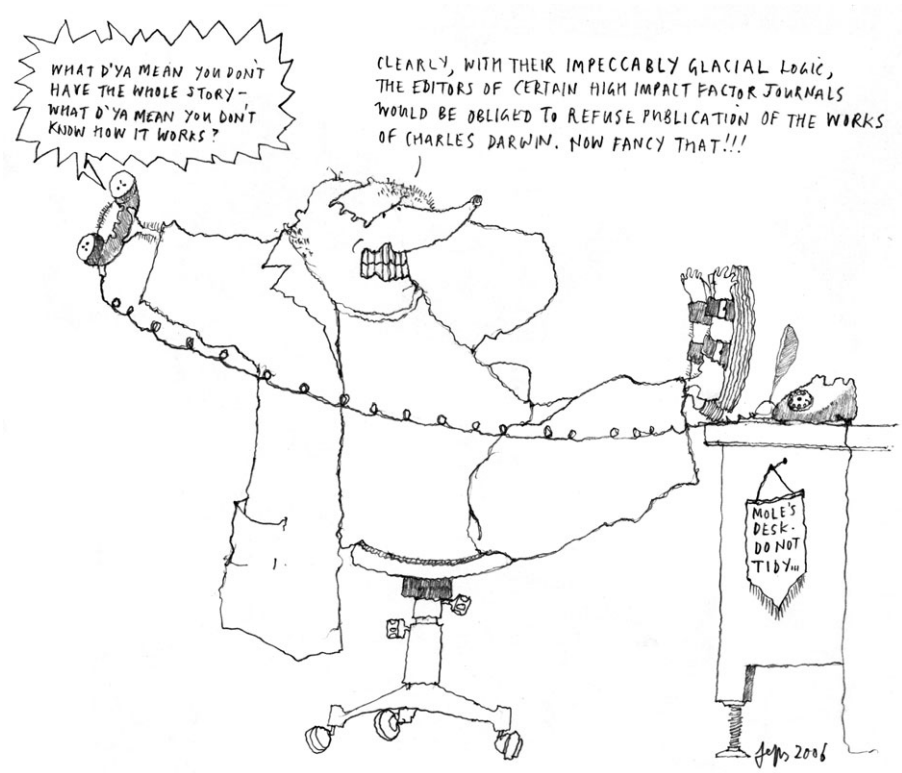
Journal of Cell Science

An occasional column, in which Mole, Caveman and other troglodytes involved in cell science emerge to share their views on various aspects of life-science research. Messages for Caveman and other contributors can be left at **mole@biologists.com**. Any correspondence may be published in forthcoming issues.



Tell me a story

Okay, this is all my fault. Faithful readers know how I feel about telling stories – this idea that science is a process where we can, at best, approximate some sort of construct of reality that is ultimately little more than a parable, an ‘as told by, based on actual events’. In telling the story we propose how things ‘really’ are, hopefully fully aware that this has as much to do with actuality as an eye-witness account. But the stories are often satisfying, and some of the best ones are serialized so that we can be thrilled by each new installment. We value the tales, and we pass them down to the succeeding generations by our oral and written traditions.

Little did I know that this idea would cause such problems. I should have known, of course, that the myriad who read and are influenced by what I’ve written would take the message to heart and change things to ensure that science strictly adheres to the principles of good story-telling. Okay, I’m drifting into fantasy. Maybe it isn’t my fault. But I think we need to clarify the story idea, because it’s definitely becoming a problem. Let me back up a bit here, and tell you what happened.

Yesterday I had tea with my friend Weasel. Remember Weasel? He and I are the best of friends, despite rumors to the contrary (rumors we promote, in the hope that we will be asked to review each other’s grants and papers, which unfortunately never happens, perhaps because we hug each other in public). Oh, and we don’t actually drink ‘tea’.

Weasel, who is much smarter than I am, had submitted a paper that is utterly revolutionary. His findings are so astonishing that I’m still marveling at what he found and secretly hating him for being so good. I had no doubt that this was stuff destined for the glossiest sort of publication. The data he shared with me are rock-hard, completely new, and certainly important. More than that, they open up all sorts of new avenues to contemplate and, I suspect, furiously work on.

I was therefore shocked that, as it turned out, the editors of said glossy journal did not send it for review – nor did the next, nor the one after that. Weasel is angry and frustrated and, given his carnivorous tendencies, perhaps a tad dangerous. Fortunately, mustelids don’t eat insectivores (at least not insectivores

who are friends), I think. Just in case, I did give him lots of cheese.

All of the editors, *all of them*, felt that there wasn't a story, because he doesn't know how this fundamentally interesting phenomenon 'works'. They all agree that it is extremely interesting, and perhaps they will reconsider some day, in the distant future, when he can explain it – completely. *Then*, they suggest, it will be a story. Unless, of course, somebody else notices it in the meantime.

Once upon a time, we reported observations that we felt would be of general interest to the scientific community. A species of iguana that swims could be of major importance, even if we didn't know how it got to be like this. (I know that this was considered important, because I saw *Master and Commander*, so it must be true.) Description of new things is an essential part of what we do, and sharing careful observations is at the heart of our enterprise. Explaining what we see is another part of the process, but must it always go hand-in-hand?

Weasel and I had more 'tea'.

The problem, as he sees it, is an emerging one. In an effort to make the highest-impact journals more 'impacty', the best-read publications insist on 'completeness'. Make an observation and explain it. Tell a story that has a beginning (we noticed this), a middle (so we did more experiments), a climax (we did the critical experiment, and it worked!), and a satisfying ending (now we know how it all works and we can all do something different with our lives).

But this isn't the only way to tell a story. Sometimes the observation and the climax are the same thing. We saw something remarkable, and we proved that what we saw actually happens. Yes, the iquana swims, and even if I can't bring you to the island where it lives (but I'll tell you how to find it), here is a dead one that has webbed feet. Sometimes a story is a *mystery*, and we don't know who done it.

The insistence that every observation must be fully explained in order to be worthy of our attention is not restricted to the weekly magazines. More and more, we slap down researchers who have inadequately provided every answer we could wish for – we wouldn't even be able to publish an observation of the swimming iguana in *Tropical Reptiles for Fun and Profit*. The first description of a silicon-based life form (*Star Trek*'s Horta doesn't count) would be something I'd want to read about, even if the authors couldn't figure out the metabolic pathways.

There is a deeper problem with the conventional story approach. By demanding that every rigorously observed phenomenon comes packaged with complete explanations, we are begging for pseudo-explanations. And since we're telling stories, these explanations are given as much weight as the phenomena themselves *because we can't tell the difference.* I'll give you an example.

Everyone knows that marsupials live in Australia. I've even met quite a few there, and they are widely known as the local party animals. Now if you ask most biomedical researchers (not *real* biologists) about why marsupials live in Australia, they'll tell you that its because these metatherians don't compete well with eutherians and so found a place where they could be free of this awful struggle to live in peace. The proof is easy: marsupial parties down under have been decimated by the unwelcome intrusions of eutherians, such as rabbits and dogs, who eat all the snacks.

But of course, while it *is* true that there are lots of marsupials in Oz, the explanation is a fiction. Introduced animals often wreak havoc on extant populations, regardless of being 'meta' or 'true'. Marsupials arose in North America, and they migrated down through South America, where they radiated, en route to Australia, by way of (then) balmy Antarctica, where they radiated again. The species in the Americas are doing just fine, thank you, despite all the party poopers they co-exist with. The observations about Aussie pouchers are perfectly true, but the explanation is so much fluff.

As scientists, we *need* to disseminate (and read about) fundamentally interesting observations. If we think we can explain them, then that's very useful. But we must be able to tell one from the other. It isn't always necessary for the explanation (if we have one) to be tacked onto the observation to validate it. Editors and reviewers, take note, please. We love a good mystery.

Let's put the emphasis on what's *interesting*. Sometimes it's the explanation, as in, 'Wow, I didn't think it worked like *that*.' Sometimes, though, it's the observation itself (just 'wow!'). Yes, for it to be scientifically valid, these observations have to be made with sufficient rigor to ensure they aren't simply artifacts. But once that's accomplished, let's let the word get out. Maybe that way someone *will* find an explanation someday. And the observer will get the credit they deserve, for letting us know in the first place.

Believe me, you want to hear Weasel's story.

Mole

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