

“There Are a Lot of Wonderful Papers Out There...

... , more than perhaps ever before in the history of science, and it is very helpful to chat about *why* they're good; and there are a lot of really terrible papers out there, more than perhaps ever before in the history of science, and it is very helpful to chat about *why* they're bad.”

That's a quote from a 2004 essay in the *Journal of Cell Science* that defended the good old but somehow dying tradition of debating papers in departmental 'journal club' seminars. No discussion on that point, however. 'Journal clubs' are definitely necessary and worthwhile instruments in higher scientific education.

In fact, we were reminded of this quote by another, much more recent, comment that we had read only last month in the *Chronicle of Higher Education*. The title, “We Must Stop the Avalanche of Low-Quality-Research” (<http://chronicle.com/article/We-Must-Stop-the-Avalanche-of/65890/>). So our topic here should rather be about paper quality.

The logic of this comment is very simple (we'd even say 'over-simplified'). The number of researchers has increased tremendously during the last decades and, no wonder, so has the number of publications. “The last few decades have seen astounding growth in the sheer output of research findings and conclusions,” the authors thus write. “Just consider the raw increase in the number of journals. Using *Ulrich's Periodicals Directory*, Michael Mabe shows that the number of “refereed academic/scholarly” publications grows at a rate of 3.26 percent per year (i.e., doubles about every 20 years).”

Well, no problem with that, so far. At first hand, more publications could well mean more discovery and more knowledge. However, the authors don't believe this is true. “While brilliant and progressive research continues apace here and there, the amount of redundant, inconsequential, and outright poor research has swelled in recent decades, filling countless pages in journals and monographs,” they write. And they further claim that proof for this statement is provided by certain citation analyses. “Consider this tally from *Science* two decades ago: only 45 percent of the articles published in the 4,500 top scientific journals were cited within the first five years after publication. In recent years, the figure seems to have dropped further. In a 2009 article in *Online Information Review*, Péter Jacsó found that 40.6 percent of the articles published in the top science and social-science journals (the figures do not include the humanities) were cited in the period 2002 to 2006.”

Therefore, the conclusion of the authors is a relentlessly radical one, “As a result, instead of contributing to knowledge in various disciplines, the increasing number of low-cited publications only adds to the bulk of words and numbers to be reviewed. Even if read, many articles that are not cited by anyone would seem to contain little useful information. The avalanche of ig-

nored research has a profoundly damaging effect on the enterprise as a whole. Not only does the uncited work itself require years of field and library or laboratory research; it also requires colleagues to read it and provide feedback, as well as reviewers

to evaluate it formally for publication. Then, once it is published, it joins the multitudes of other, related publications that researchers must read and evaluate for relevance to their own work. Reviewer time and energy requirements multiply by the year. The impact strikes at the heart of academe.”

Phew! Let's take a deep breath first. Of course, the authors go on writing a lot more about the deeper reasons for such an aberrant development and, of course, they propose even more potential actions to alter course again. However, are they so unquestioningly right with their pre-assumptions?

First of all, does all research that is barely cited during a certain time period really have no impact? Or, conversely, does an increasing number

of citations necessarily have to correlate with importance and quality. Think of McClintock's mobile DNA elements, Margulis' endosymbiotic theory, Prusiner's prions, Blobel's signal peptides, Marshall's *Helicobacter* story, ... All of them weren't cited for years and even decades after publication – only to become major discoveries later. And on the other hand, how many 'citation blockbusters' have turned out to be plain wrong or even flawed?

No, the assumptions of the authors do form too weak a basis to go on painting such a dark scenario of the future of research. Although admittedly there is a grain of truth in their complaint. The number of 'bad papers' has definitely been increasing in the last decades – as already stated in the initial quote. But maybe the chain of causation is actually leading us in the opposite direction: the number of 'bad papers' has been increasing *because* ever more new journals have been founded.

The following quote from a blog comment at least provides anecdotal evidence for an underlying mechanism, “I've been the reviewer myself on multiple occasions where I pointed out problems and a paper was rejected, and soon afterward, the same paper appeared, with the same problems, in another journal.”

Apparently, journal space is no longer a limited resource. The consequence being that, in these days, when scientists need nothing more urgently than publications to boost their careers, every manuscript – as 'bad' or 'good' as it may be – has a very high chance of being published 'somewhere', at least.



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