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SLEEPING BEAUTIES AND THE GRIND OF SCIENTIFIC COMMUNICATION

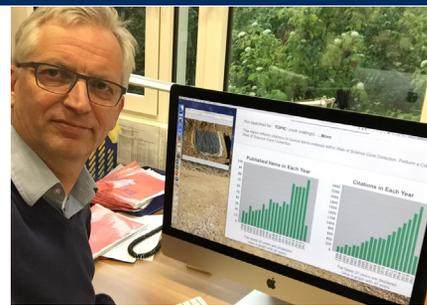
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An article on the “sleeping beauties” in science (Ke et al. 2015) recently appeared on my desk (or more accurately, on my desktop). “Sleeping beauties” in science have been defined by van Raan (2004) to be publications that go unnoticed for a long time and then suddenly attract a great deal of attention. The “sleeping beauty” concept prompted me to review whether their existence is a component of our current publication practices. Do we have the incentive to develop risky ideas or the time to put together significant, paradigm-shifting papers?

Neither “sleeping beauty”-style publications nor the incentives to develop them seem to be fashionable today. Rather, we find ourselves in an ever-accelerating publication grind. The growth rate of new publications was 9% for the time period between 1950 and 2010 (Bornmann and Mutz 2014). What this means is that the scientific literature doubles about every 10 years! One reason for this increase is, of course, the general growth of the global science enterprise. Another is the shift from hardcopy to digital publications, which has removed all physical limits to the size of the pool. A third is the increase in new journals and publications fueled by the commercial interests of publishers. The final one is our career incentives: funding agencies fund and university departments hire, pay, and promote scientists based on their exposure, mostly measured by the number of publications and their citations. We cannot escape the grind.

A faster “attention decay” is a consequence of the accelerated publication rate. After an initial peak in citations, the citation rates of most papers decay away within a few years. Today, the “citation half-life” in the sciences is only about 5 years (Parolo et al. 2015). The attention decay arises because scholars have only a finite capacity to keep track of, let alone actually absorb, the increasing volume of scientific literature. Evidently, findings become ignored faster as successive papers crowd them out in a researcher’s mind. Bibliometrics cannot reveal whether the newer papers make earlier papers obsolete because they represent real growth of knowledge, or whether the fast turnover is due to a combination of reiteration of previous findings and “salami slicing”: scientists splitting up papers for career advancement. My personal impression is that the latter effects are dominating. Geosciences do not renew paradigms every half decade.

How do we master this flow of information? One means is to travel. Attending two large conferences and several specialised workshops per year is standard for many of us to stay abreast with potential developments. Another is to make use of communication technology. Alerts to new publications arrive daily into our email accounts. Graphical abstracts and one-sentence summaries enable us to gather the essence of an article without the need to actually read it. Twitter, Facebook, and Research Gate all help us to communicate easily digestible soundbites of scientific information in real time. Being permanently online is the key to staying on top.



Selfie of a scientist watching the publication grind on the rise.

In their provocative article “Science in the Age of Selfies” the two applied mathematicians and brothers Donald and Stuart Geman (2016) bemoan this development. The easy access to communication and to interaction results in “scientists working in the same direction, rather than towards a diversity of ideas”, and “papers become mere progress reports”. Prolonged periods of focus on a topic become rare during the constant external stimulation by modern scientific communication. These prolonged periods of focus however are required “for finding organised explanations for the world around us”. Explanations that provide the basis for the publication beauties.

Still we cannot, and we may not wish to, reverse this development. Thus, each of us needs to make a choice on how to operate in this daily grind. Is your goal to write “fast attention” or “sleeping beauty” publications? Having read this far, you will have guessed that I would recommend shifting your personal balance towards writing more of those papers that warrant a long attention span. To get there, one avenue is to read widely enough and deeply enough to capture the context of what previous researchers have done and what you yourself are doing. Another is to spend more time generating ideas than promoting soundbites of them in the various forms of progress reports. Eventually we may work towards changes in incentives: funding agencies that limit the numbers of allowed self-citations in a proposal, and search committees that actually read, rather than count, publications of applicants to gauge their depth of thought. But what about the “sleeping” part of the beauty recommendation? Just don’t be too concerned if the citation breakthrough does not emerge immediately. A delay before breakthrough is the hallmark of a true classic that is ahead of its time.

Friedhelm von Blanckenburg
Principal Editor

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