

Would scientists be willing to write anonymous papers?

A lot has been written over the last decade about whether science is broken¹⁻⁶, including insightful editorials in this journal^{7,8}. Horton⁵ succinctly pointed to various problems with the publication-oriented manner in which research is being carried out, among which are: (1) manipulating data to fit a story/hypothesis, (2) undue importance to significance tests, (3) unhealthy competition to publish in selected journals because of the importance given to impact factors, (4) assessing scientists using reductive metrics, and (5) incentivizing scientists to be productive rather than being right. Fanelli³ reported that over one-third of scientists surveyed admitted to questionable research practices. Among the solutions suggested by Horton⁵ are: (1) removing incentives, (2) pre-registering protocols, (3) promoting collaboration instead of competition, (4) promoting intensive rechecking of data by the research community, (5) rewarding good pre- and post-publication review, and (6) improving research value, research training and mentorship. Other solutions recommended in response to the problems of publication-oriented research have been to self-publish on the web and allow for open commenting (see ref. 9), or to use a hybrid system such as allowing public commenting on submitted work for a fixed period, followed by revision and peer-review^{10,11}. However, an open-peer review trial conducted by *Nature*¹² elicited poor participation by authors and reviewers, possibly due to excessive competition in research¹³. Colquhoun¹³ suggested that the deluge of papers needed to be stopped, and limits imposed on the number of grants held as well, so that committees might actually read the smaller number of papers instead of merely counting them. Following this line of thought that we seem to be swamped by too many papers, most of which do not advance our understanding¹⁴, I suggest a drastic measure, which will likely not be received well, but which I hope will at least have the effect of inducing some of us to reflect on the current system.

I suggest that all papers be anonymous. This goes back to the basics of why papers should be written at all. Writing serves the purpose of communicating findings and recording them for

posterity. However, in the words of Allen Bard (quote from ref. 14), 'In many ways, publication no longer represents a way of communicating with your scientific peers, but a way to enhance your status and accumulate points for promotion and grants'. I think science should focus primarily on ideas rather than on people and, therefore, not much would be lost if author names and affiliations were to disappear from papers. In fact, I argue below that there is much to be gained by making this shift.

If we reflect upon the glories of ancient and more recent civilizations, there are not many names that persist across time. For example, while the names of some kings remain, we do not know who designed various Egyptian temples or sculpted the beautiful statues at Ellora or Thanjavur, or painted at Ajanta, yet anonymity does not detract from the splendour of the work. We do not know who wrote the *Epic of Gilgamesh* or, indeed, parts of the *New Testament*. Thus, a quest for eternity through name is likely to be a futile endeavour. In science too, few names are remembered, but good works are crucial as they serve as the basis for further inquiry. Since science is a collective endeavour temporally, in the sense that it builds upon previous work, we have an enormous responsibility to prevent obfuscation of the scientific record by meaningless or erroneous papers so that future researchers are not led astray. In a scenario of anonymous papers and no material credit given for papers, I expect that the number of papers written will fall drastically because the only impetus to write a paper would then be to communicate exciting findings, the original reason for publication. This will allow the next generation of researchers to 'stand on the shoulders of giants' (as proclaimed by Newton), rather than being buried under avalanches of inconsequential papers.

Roosendaal and Geurts¹⁵ have often been cited for listing out the functions that should be fulfilled by scholarly communication as: (1) registration, (2) awareness, (3) certification and (4) archiving. A system of using anonymous papers will continue to fulfil all these functions. Papers can be identified using a number instead of names, which can be used in citations. Researchers wishing to

contact the author can do so through the journal (or platform such as ArXiv that hosts the paper) or, if something akin to an ORCID ID is used, through that database. The point is not to ensure that the author names are never available (as, even with double-blind peer review, author identities may be evident to some degree depending on the field of work), but to not make them obvious. This might reduce citation biases and peer-review biases based on certain authors/groups/places and facilitate focusing to a greater extent on the ideas being communicated. However, the advantage of anonymity will be restricted to reducing these biases, unless anonymity is also coupled with a policy of not using papers to reward researchers.

Using published papers for assessing researchers is just an accepted method of shifting the responsibility of assessment to the peer-reviewers of the papers. Given that the standard peer-review system leaves a lot to be desired¹⁶⁻¹⁸, this is not very heartening. Since reviews themselves are usually not published, there is tremendous scope for undesirable practices such as rejecting papers from competing groups or papers challenging pet beliefs, stealing ideas and delaying reviews, insisting on citations of one's own papers, and favourably reviewing papers from the 'old-boy network'. There have also been other conflicts of interests ranging from the political to religious to financial considerations (see ref. 16). I suggest that papers be left unsullied by the politics of publication (see ref. 19) for the current and future generations to use, and researchers be judged by other outputs. Ph D students, postdocs, candidates for faculty appointments and PIs can be judged by their doctoral thesis or reports of their work and their scientific understanding, as well as teaching and mentoring ability, when applicable. Funding agencies can evaluate the proposal and capability of a PI to carry out the proposed work based on previous projects, reports and expert committee interviews, and do not really need to rely on the number of papers published. In the current system, Ph D students are forced to try to publish what may not be interesting and faculty are judged based on their Ph D students' publications, which then, depending on the first few

students who joined them, can make or break careers. The focus for faculty then changes from training students to become good researchers to either finding students who do not have to be trained or will simply be a 'pair of hands' (see ref. 20) to execute well-laid out problems.

It has been suggested that a limit be imposed on the number of papers each researcher is allowed to write every year in order to check the problems associated with the burgeoning number of papers¹³. However, I think this would be an excessive restriction on the personal freedom to write. Another point to ponder about is whether anonymity of authors would still be necessary if papers were not used to assess them. Not using the number of papers published by them to assess researchers could get rid of several problems such as the proliferation of meaningless papers and journals, bad practices, including plagiarism to increase the number of papers quickly, and rewards based on such papers. However, I think anonymity of authors would still be desirable because it would disincentivize other problems that relate to the ego of a researcher. For instance, increasingly, researchers do not cite relevant previous work in an attempt to showcase their work as being novel^{21,22}. Such 'citation amnesia' may be lowered by implementing anonymity of authors in papers²³. This might also help bring down bad practices such as irreproducible experiments and data fabrication in order to gain fame. While it is nice to be the centre of attention because of good work, the ultimate reward for a scholar comes from intellectual understanding rather than external recognition (Perelman had posted a proof of Thurston's geometrization conjecture on arXiv in 2002 rather than submit it to a journal, and refused the Fields Medal, although unfortunately, external recognition is usually spurned only after bitter experiences). Moreover, anonymity does not stand in the way of a work becoming popular or notorious – Malthus' first edition of *An Essay on the Principle of Population*²⁴ comes to mind. Removing authorship in papers to focus on intellectual growth is analogous to the idea of Pirsig²⁵ of getting rid of grades in order to obtain a real education, which is now gaining some ground in the West.

Is it possible to actually have anonymous papers and assessments that are not

based on papers in this day and age? In the civilization that gave us '*Karmanye vaadhikaaraste maa phaleshu kadaachana...*' (the concept of *nishkam karma* or 'action with involvement but without the desire for reward') and in the time of the open movement, I would submit that the answer is 'yes'. The paper publication mode is very recent in human history (scientific journals as we know them date back to 1665, scientometry only began in the 1960s, and there seems to have been increasing corporatization of academic research since the 1980s, see ref. 26) and we have made a lot of progress in understanding the natural world without the recently standard method of doing science. Therefore, this cannot be the only or best mode of doing science. Moreover, this is an era of open movements, of open software, and Wikipedia, which is edited by thousands of volunteers. I would like to think that there are bright students for whom the politics of science has not yet worn-off the sheen of doing science and who would like to be part of the scientific process for the right reasons. The present academic scenario is demoralizing for many students, resulting in many a blog listing reasons to not go to graduate school, and there is an urgent need to improve the situation. I, therefore, think the question is not whether it is possible to actually implement anonymity in authorship and assessments that are not based on scientometrics, but whether we want to. Would scientists be willing to write anonymous papers? I would dearly like to know and, towards this end, have set up an on-line questionnaire (please go to the website <https://www.surveymonkey.com/r/6JJTLVB>), which I invite readers to fill out.

This paper is anonymous in keeping with the spirit of what it espouses.

1. Ioannidis, J. P., *PLoS Med.*, 2005, **2**, e124.
2. Wager, E., *Nature*, 2006; doi:10.1038/nature04990.
3. Fanelli, D., *PLoS ONE*, 2009, **4**, e5738; doi:10.1371/journal.pone.0005738.
4. Hvistendahl, M., *Science*, 2013, **342**, 1035–1039.
5. Horton, R., *Lancet*, 2015, **385**, 1380; doi: [http://dx.doi.org/10.1016/S0140-6736\(15\)60696-1](http://dx.doi.org/10.1016/S0140-6736(15)60696-1).
6. Gobry, P.-E., *Week*, 2016; <http://the-week.com/articles/618141/big-science-broken>

7. Balaram, P., *Curr. Sci.*, 2010, **99**, 709–710.
8. Balaram, P., *Curr. Sci.*, 2010, **99**, 857–858.
9. Burdett, A. N., *Science*, 2013, **342**, 1169.
10. Koop, T. and Pöschl, U., *Nature*, 2006; doi:10.1038/nature04988.
11. Sandewall, E., *Nature*, 2006; doi: 10.1038/nature04994.
12. Editorial, *Nature*, 2006, **444**, 971–972; doi:10.1038/444971b.
13. Colquhoun, D., *The Guardian*, 5 September 2011; <https://www.theguardian.com/science/2011/sep/05/publish-perish-peer-review-science>
14. Hamilton, D. P., *Science*, 1990, **250**, 1331–1332.
15. Roosendaal, H. E. and Geurts, P. A. T. M., In *CRISP 97: Cooperative Research Information Systems in Physics* (eds Karttunen, M., Holmlund, K. and Hilf, E. R.), 1999, pp. 1–32.
16. Triggler, C. R. and Triggler, D. J., *Vasc. Health Risk Manage.*, 2007, **3**, 39–53.
17. Balaram, P., *Curr. Sci.*, 2010, **98**, 5–6.
18. Seife, C., *Slate*, 1 April 2015; http://www.slate.com/articles/health_and_science/science/2015/04/fake_peer_review_scientific_journals_publish_fraudulent_plagiarized_or_nonsense.html
19. Lawrence, P. A., *Nature*, 2003, **422**, 259–261.
20. Balaram, P., *Curr. Sci.*, 2003, **85**, 701–702.
21. Balaram, P., *Curr. Sci.*, 2000, **78**, 1177–1178.
22. Grant, B., *Scientist*, 2009; <http://www.the-scientist.com/?articles.view/articleNo/27503/title/Citation-amnesia--The-results/>
23. Raloff, J., *ScienceNews*, 2009; <https://www.sciencenews.org/blog/science-public/citation-amnesia-not-good-our-health>
24. Anonymous, but later known to be Malthus, T. R., *An Essay on the Principle of Population, as it Affects the Future Improvement of Society, with Remarks on the Speculations of Mr. Godwin, M. Condorcet, and Other Writers*, J. Johnson, London, 1798.
25. Pirsig, R. M., *Zen and the Art of Motorcycle Maintenance: An Inquiry into Values*, William Morrow and Co, New York, 1974.
26. Lieberwitz, R. L., *Akron Law Rev.*, 2005, **38**, 759–770.

ACKNOWLEDGEMENTS. I thank Prof. Sundar Sarukkai for a brilliant talk, which sparked-off the train of thought that I espouse in this letter, as well as students and colleagues with whom I have had encouraging discussions.