

## Trendy science research communications\*

T. Ramasarma

Curiosity of the natural phenomena motivates inquiry. Observations recorded created knowledge banks with access generations after. Scientific research flourished at an exponential pace since 1960s in the world and India. Journals and conferences multiplied matching growth of funding, laboratories, scientists and publications. Adding new information to the scientific literature gives satisfaction for research efforts. No incentive matches passion to discover as the driving force in scientific research. Publishing in journals and presenting in symposia are the means. Wanting to be noticed is natural.

### Early model of science communication

In the early years, when the scientists were few, results of research studies were recorded in their own treatises and exchanged in personal contacts. As the numbers grew and as printing became available, findings were reported in bulletins usually published by academic societies. Modern scientific research expanded initially in Europe along with awareness of the benefits thereof. Coinciding with this, scientific journals, as now popular, started in the second half of the 19th century in German, French and English. Papers used to be written in personalized styles, described experiments in detail that allowed reproducing them and thus built trust in printed works. The presentation of data in the papers evolved through the next few decades into the present form of introduction, materials and methods, results, discussion, acknowledgments and references. Sometime along, opinions of established workers were sought in the decision-making process that morphed into the currently feared 'peer-review system'. Those helpful editors/reviewers appeared to see the good in the paper to take it in rather than pick a fault to keep it out. Rejections must have been there, but journals rarely advertised.

\*This note is based on the remarks made at the inaugural of TRendys-2013 meeting in University of Hyderabad on 22 November 2013.

### Air-mail post era

Bulky packets of typed manuscripts in duplicate along with artist-drawn figures were air-mailed at considerable expense to the journals. Communications were slow even after airmail service. It took 2–3 months to know the response from the editor, and at least a year to see the accepted paper in print. It was usual in the early 1950s to receive scores of reprint request cards. It made you feel good to know that many saw your paper and wanted to possess a copy. Occasionally these included a compliment. Invariably they first gave the reference of the printed article before the journal arrived. Coming unexpectedly from Eastern Europe, Latin America and countries you never knew, it was a virtual stamp collection. Reprint exchange became a 'lost pleasure' after the advent of xerox machines. It is difficult to know who read your paper or copied it. That was in B.C. – Before Computers.

### Computer era

Personal computer changed the accessibility and dissemination of printed information. This saved paper, and gratefully the trees. Typewriters disappeared. Communications through e-mail dramatically decreased transit time from months to minutes and also the burden on postal service. The rapidly proliferating scientific literature is now made available on-line at your desk. Journals are now received on your monitor screen as fast as they appeared anywhere in the world, a welcome change compared to the three-month wait before. And you can download instantly the article you want. Scientists virtually deserted libraries. A few current journals on display in libraries carry fingerprints of only their staff. Yet, I still crave to browse journals to know randomly who is publishing and to discover things I am not looking for.

### Enter citation phenomenon

Citation index appeared in late 1950s and caught the imagination, and the vanity, of authors as a popularity measure. Citation of an article in another paper is an

indication that it was seen and helped in some way. It assumes if more authors consider it worthy of referring to a paper, it must have something good. Reviews and methodology papers receive large citations. Citation can be valued appreciation or annoying criticism. Citations depend on author density of a field of research. Even the best work in fields with only few workers and publications, naturally receives poor citation, but nonetheless important. World over grants and evaluations came to depend on the citation index of an author or a journal and other related metrics. Citation index is useful information but of limited value in India.

### Bias in citation

Citation practices are biased and unfair to work from India and some other countries. Indian names appeared in the index of the prized *Annual Reviews of Biochemistry* regularly before and became rare in 1970s and after. By this time, ironically, the quality of work from India noticeably improved. Papers from India are often ignored, what with unfamiliar names and absence of fear of retaliation as potential reviewers. Many deserving Indian papers are brushed aside. I refer to an example that many would have experienced. Our paper with an original finding is cited by a 'peer' in his short paper, essentially reproducing our experiments, feigning being unaware. Amazingly, it slipped through editorial filter. Ignoring our later work delineating the many steps involved in the pathway, the peer cites his paper in his second claiming the effect is explained. From then on the whole lobby cites the peer as the discoverer. Identifying the original finding and the author is a forgotten grace in the current craze of grabbing credit. 'There is a bias in citation practices, particularly for the papers from laboratories from developing countries even when they are published in leading international journals.'<sup>1</sup>

### Journal impact factor

Quantitation of quality of journals is rubbed in by the metric of journal impact factor (JIF). The impact factor (IF) is the

number (0 to >40 with decimals) of total citations divided by the number of papers published in a journal for a period. More citations of its papers mean higher JIF and higher notional rank for the journal. JIF is good for the journals implying their papers influenced the progress of research. Some elated editors declare that their journal achieved a higher IF. Other journals, with not so high IF, highlight their publications that won distinctions. It is recognized that all papers in a journal are not equal. Regardless of quality, one uncited paper can bring down the IF number. A paper on a new phenomenon may remain unnoticed until other workers realize its importance and citations zoom. For some with initial high visibility, citations vanish after failed claims. Schekman<sup>2</sup> in a critical appraisal on IF states remarked: 'A paper can become highly cited because it is good science – or because it is eye-catching, provocative, or wrong.' He finds that some of the top journals 'distort scientific process', calls them 'luxury journals' and vows not to send papers to them any longer. Relevance and reputation of a journal in the discipline of research are important, and there will always be valued journals. They owe their exalted status to the perception of the authors and this keeps changing like quick-sand. Ultimately, quality stands out wherever it is published. Remember the haunting words of Goldstein<sup>3</sup>: 'An ounce of creativity is worth a ton of impact.'

### Publication fads

It is natural for an author to seek a good journal to publish a paper. The more difficult it gets to a paper published in a journal, higher is its rank. Some journals immodestly declare their high percentage rejections, a new phenomenon of self-assessment. At the risk of joining the statistics, authors pursue reputed journals because of the associated glamour. Unconcealed exuberance of such authors is revealed by inserts in their talks such as 'this is published in *PNAS*' and 'this is accepted in *Nature*'. This situation is further compounded by benefits provided for high-profile publications in doling out appointments, promotions, awards, academy memberships and other recognition factors. A step further, it is reported that the Chinese Academy of Sciences pays huge bonus to the author

for publishing in a major journal, and in its wake, cases of 'authorship for sale' is promoted by unscrupulous companies<sup>4</sup>. No wonder research and publications are reduced to business. In the local context, membership of academies or getting awards attracts additional sum in monthly salary, and according to Desirazu<sup>5</sup>, all is lost on 'equating science with cash'. That the expected outstanding output came out of special awards (e.g. Swarnajayanti), and that quality improved after these incentives, is yet to be established.

### Journal-driven research

Such publication fads lead to journal-driven research. Scientists unconsciously start planning a project to fit with the image of high-impact journal they admire. This becomes obvious in the choice of problems, instrumentation, test parameters, experiments done and willingness to do more which referees invariably ask, and conclusions drawn that fit with hypotheses, theories or myths sustained by peers. They submit to English improvement for a fee by journal-approved specialists, pay page charges and, sometimes, hefty publication fees that are now common. It is true that outstanding work appears in 'top' journals. It is no less true that discoveries also appear in 'ordinary' journals. A combination of good and average journals and papers is natural and necessary. Is it not the presence of the short in the crowd that distinguishes the tall? Common to all is the new, disturbing phenomenon of deliberate misconduct, a form of corruption. Shocks of fabrication of data, and of withdrawing papers often from highly rated journals are increasing. Sad to see Indian names in the list. Confidence is shaken in publications, regardless of JIF. All this can be traced to the greed for easy success.

### Declaration of research assessment

A group of scientists at the San Francisco meeting in December 2012 concerned with improper use of JIF, virtually 'declared war on the impact factor' in the words of Balaram<sup>6</sup>. Recommendations restricting the use of JIF were formulated in the declaration of research assessment (DORA)<sup>7</sup>. The general rec-

ommendation is forthright: 'Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.' DORA gave the wake-up call with memorable statements: 'Cite primary literature in which observations are first reported rather than reviews in order to give credit where credit is due.' 'Scientific content of a paper is much more important.' The problem lies in our inability to understand and evaluate the scientific value. Therefore assessment tends to depend on some imperfect metric, a numeral to compare quality.

### On-line journals – watch frauds

On-line journals were started with the good intention of freely accessing publications, in contrast to subscription journals with ever-increasing costs. One of the earliest, *PLoS ONE*, the journal of the Public Library of Science, retains credibility, good refereeing and editing, and openness. But on-line journals have multiplied beyond imagination, and are now falling prey to money-making rackets. It is revealing to read the article, 'Who's afraid of peer review?' by Bohannon<sup>8</sup>. The sting operation by *Science* with a concocted paper on a fictitious lichen-derived anti-cancer compound, an extremely popular subject these days, disclosed that once the demanded fee is paid the paper is accepted with 'little or no scrutiny at many open-access journals'. And the disconcerting news is that India is the hub for many of these. I have known a case of a journal waited only for the fee and printed a paper, even after being alerted on dubious experiments and misconduct of the author. Concerned scientists have to find mechanisms to promote genuine journals and to eliminate the fraud. Schekman<sup>9</sup>, the editor-in-chief of the on-line journal *eLife* supported by Howard Hughes Medical Institute (USA), Max Planck Society (Germany) and Wellcome Trust (UK), sees 'a solution in open-access journals'. In this model, this on-line journal will accommodate, sans constraint of number of pages, 'all the work that meets the editorial criteria', is 'freely available to everyone' and it will 'cover the costs upfront by a fee levied'. Requirements for acceptance that superficially are no

different from top journals, include: 'the work moves a field forward, provides fresh understanding, corrects established beliefs, or answers a long-standing question, inspires new approaches or opens up areas of investigation'. These ventures must succeed to uphold credible publishing practices.

### The preprint server

The website, arXiv, is working well for some time as preprint server for physics, mathematics and social sciences, wherein scientists can 'deposit papers as soon as they are ready to share them, weeks or months before formal publication'. Several major journals agree to such an arrangement and accept to publish them when found suitable. A similar website site, bioRxiv.org<sup>10</sup>, by Sever and Inglis, 'the preprint server for biology' was recently launched by Cold Spring Harbor Laboratory Press in New York. It serves as open exchange of information between working scientists. It is to be seen how well this is received by the biology community in the present context of imaginary competition, excessive caution and valid fear of losing priority in this digital age. I recall a similar programme, 'Information Exchange', was promoted by NIH, USA during 1960s. Authors used to mail copies of manuscripts to Information Exchange, simultaneous with a journal. These were reproduced and mailed (hard copies, bulky mail) to the members signed for groups formed for selected topics, such as 'oxidative phosphorylation'. The programme assumed honesty of the users to credit the authors, but this was not so always. For example, a new idea in our manuscript was lifted to do quick experiments and publish as a rapid communication without mention of the original manuscript. Uncontrolled exchange of information, some of which was never found in print later, led to confusion, objections and withdrawal of the service.

### International conferences – 'dime a dozen'

It is an honour to be invited to speak in a conference. It is euphoric to present your work at an international conference along with leading scientists. These annual

conferences benefit the participants scientifically and the organizing academic societies monetarily<sup>11</sup>. Now conference organization became a business and feasting on the vanity of scientists. 'Invitations' to speak at conferences arranged in exotic locales (a vacation, if you please) are received in the e-mail every week. You can 'buy an invite' paying a high registration fee, like some on-line journals. And you are 'invited' to chair a mini-symposium of your choice if you gather  $n$  speakers who pay their registration fee, and get your registration free (buy  $n$ , get 1 free). China and Europe are active in this venture and India is catching up. What honour comes with these?

### ResearchGate

A 'social networking site for scientists and researchers to share papers, ask and answer questions, and find collaborators', named ResearchGate<sup>12</sup> was started recently by Madisch, Hofmayer and Fickenscher (USA and Germany). Bill Gates (Microsoft) joining the site as an investor, enhances the strength of the company. The site includes 'profile pages, comments, groups, job listings'. Members are encouraged to 'share raw data and failed experiment results as well as successes, in order to avoid repeating their peers' scientific research mistakes'. A novel feature provides information on who cited your research, when and where. This comes to your email regularly free of charge. I am pleased to receive this information collected from a wide range of journals which I could not have reached.

### Who is publishing in my domain?

Another welcome feature named 'Who's Publishing in My Domain? (WiPiMD)<sup>13</sup>, an on-line free service on 'citations to peer-reviewed publications' has been introduced by BioMedLib. Two of my publications were picked and valuable information, which would have been difficult for me to gather, is sent periodically to my e-mail on articles citing them, and also on related top-20 articles published in my domain. The WiPiMD journal offers the following periodic services in response to your keywords and queries: 'Updater' will send the most

relevant articles; 'Article Summarization' sends you a concise summary of the latest and most relevant publications; 'You Are Cited', BioMedLib's citation-notification service sends a list of articles citing your publication and 'Free PDFs' sends articles with free full-text PDFs.

Beware of the disturbing trends of the current trendy science communications. Publish you must in appropriate journals and also participate in relevant conferences. It is time to come out of the box, at least out of journal-mania. Quality is always in the contents of the work and a journal enhances its reach to the readership. Modern communication systems, unimaginable two decades ago, such as on-line processing of publication and correspondence, and services like internet access of information, powerpoint and other facilities that improve data presentation, ResearchGate and WiPiMD are indeed of great help to the working scientist. Digital age has overpowered communications and science research has to adapt to the speed and benefits.

1. Ramasarma, T., In *Bioscience Education in Developing Countries* (eds Ramasarma, T., Avadhani, P. N. and Radhakrishna, S.), UNESCO Committee on Science and Technology in Developing Countries, 1978, pp. 44–51.
2. Schekman, R., Guardian News and Media, USA, <http://www.theguardian.com/commentisfree/2013/dec/09/>; also *The Hindu*, 10 December 2013, reports and interviews.
3. Goldstein, S., *Nature Med.*, 2004, **10**, 1015–1017.
4. Munro, M., [mmunro@postmedia.com](mailto:mmunro@postmedia.com); <http://twitter.com/margaretmunro>
5. Desirazu, G. R., *Curr. Sci.*, 2009, **97**, 980.
6. Balaram, P., *Curr. Sci.*, 2013, **104**, 1267–1268.
7. DORA, [www.ascb.org/SFdeclaration.html](http://www.ascb.org/SFdeclaration.html)
8. Bohannon, J., *Science*, 2013, **342**, 60–65.
9. Schekman, R., [www.elifesciences.org](http://www.elifesciences.org)
10. Callaway, E., *Nature*, 2013, **503**, 180.
11. Mervis, J., *Science*, 2013, **342**, 74–79.
12. ResearchGate, <http://researchgate.net/>
13. WiPiMD journal; [mail@BioMedLib-Mail.com](mailto:mail@BioMedLib-Mail.com); <http://wipimd.com>

*T. Ramasarma is associated with Indian Institute of Science, Bangalore 560 012, India and Centre for DNA Fingerprinting and Diagnostics, Hyderabad 500 001, India as an INSA Honorary Scientist. e-mail: ramasarma\_1932@rediffmail.com*