

Indian journals: Scope for improvement*

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The *Science Citation Index* of Eugene Garfield considers the number of citations of a paper in subsequent journal literature as a reliable measure of its importance/influence in contemporary research. Depending on how often papers in a journal are cited, it is assigned an impact factor (IF). Leading or top journals have therefore high IFs. Even Garfield would not have expected that those who distribute money, positions and awards would resort to evaluate scientists not by the intrinsic merit of their scientific contributions, but by proxy indicators of performance like IF of journals containing their publications. Instead of fighting this insidious development, scientists the world over have caved in and become increasingly desperate to publish in a few top journals. In an incisive and timely article in a recent issue of *Nature*, Lawrence¹ sums up the situation tersely and succinctly. 'If we publish in a top journal we have arrived, if we don't we haven't The result is an audit society in which each (proxy) indicator is invested with a specious accuracy and becomes an end in itself. . . . Although there are good reasons for publishing papers where they are more likely to be read, when we give the journal priority over the science, we turn ourselves into philistines in our own world.' In India, a small minority of scientists (mainly in physics and chemistry) publish in top journals, while a majority settle for any foreign journal equivalent to or a shade better than a corresponding Indian journal².

Lawrence¹ analyses how authors, editors and reviewers are forced, often beyond their best intentions, to grapple with the chase for top journals. Fearing their work being scooped, authors do not wait until a piece of research is finished and can carry a convincing message, but submit it at the earliest possible moment. Findings are sliced as thin as salami and submitted to different top journals to either produce more papers or increase the success rate of a few. Other strategies include hyping the results to make them look topical,

tenuous links to a feared human disease, futuristic technology or wonder product, oversimplification for appeal and compression of results into a much shorter format than required for easier comprehension. With his experience to present the work in the best possible light, the group leader writes up the work done by a junior scientist, who in the meantime toils away in the laboratory bench increasing productivity rather than learning to write-up results himself.

With too many submissions to send out for peer review, editors are forced to prune the list themselves. 'In this they play safe and favour the fashionable, familiar and expected over the flaky and unexpected – or original. Inevitably mistakes are made.' They also tend to delegate many of their responsibilities to reviewers.

Reviewers/referees, unlike referees/umpires in sports, are not neutral, non-playing judges, but working scientists themselves. With too little time to assess many manuscripts comprehensively and natural tendency to protect one's own interests, there can be conflicts, as referees too are after all, human. Authors are often at the receiving end of their interaction with editors and anonymous reviewers, and hence some 'resort to charm offensives' with editors.

Alarmed at the undesirable consequences to obsession with top journals, Lawrence¹ appeals to authors, reviewers and editors to act to protect the quality of research and prescribes some remedial measures. What struck me about his appeal is its striking similarity to Ramaseshan's appeal about a decade ago to scientists, editors and reviewers to act to protect Indian science – at a different level³.

The issue of established and top Indian scientists publishing their best papers in foreign journals has been discussed in different fora³⁻⁵, and hence need not concern us here. What I think has not been discussed sufficiently is why a vast majority of Indian scientists (of all ages) prefer foreign journals which are no better or only marginally so, compared to Indian journals. The articles of Lawrence¹, Ramaseshan³ and Arunachalam⁴ set me thinking about any deliberate steps that might attract a sizable fraction of Indian

papers that now seek foreign journals. As a result I have the following suggestions.

The Indian Academy of Sciences, Bangalore; Indian National Science Academy, New Delhi and National Academy of Sciences, Allahabad together publish 15 core journals, excluding *Current Science*, *Resonance* and *Indian Journal of History of Science*, which is quite large – perhaps exceeding those published by science academies of any other country.

The first task is to promote academy journals in overseas libraries for wider readership, even if sporadic or casual initially. Arunachalam⁴ suggests that academy journals could be sent to carefully chosen libraries around the world for two or three years with the cost underwritten by DST or DSIR. It may also be necessary to increase frequency of their publication to not less than six per year, to ensure rapid publications of accepted manuscripts. Most libraries abroad will be persuaded to subscribe to core journals of science academies of a large country like India, if they are a reasonable number – say 5 or 6 and not 15. It should be feasible for the three academies to form a mutually supportive alliance or consortium only for the purpose of bringing out 5–6 core journals as publications of the Science Academies of India.

Each academy can take full responsibility for the publication of one or two of the core journals through an editorial board for each. The most salutary outcome of this arrangement could be a friendly and healthy competition among the three academies and attendant subtle, but sustained pressure on Fellows belonging to each of the core subjects not to be found wanting in their efforts to promote the respective journals to international visibility and reputation. Fellows may opt to publish at least one of their better papers each year in the core journals. *Current Science* can carry the contents page of each journal for the benefit of Indian scientists.

Arunachalam and Srinivasan², provided some interesting statistics on India's publications in the four years 1989–92 in *SCI* journals worldwide. In the year 1992, for which much more information is furnished, Indians (from India) published

*Dedicated to Prof. S. Ramaseshan on his 80th birthday.

more than 11,000 papers in *SCI* journals. About 200 papers (mainly in physics, chemistry, material sciences, clinical medicine, biomedicine, but surprisingly not mathematics) were in star journals. If one discounts a large number of Letters to the Editor in *Clinical Medicine and Biomedicine*, the number is close to 100.

It is doubtful whether scientists of any other major country with a long scientific tradition would chase as many as 1600 journals of variable quality published outside the country in just one year. What drives Indian scientists to do this when most such journals are not only mediocre but also would be too scarce in Indian libraries to be read by fellow Indian scientists? Ramaseshan³ aptly describes this as 'instead of attracting a larger (and discriminating) audience, they (Indian authors) are speaking in a larger auditorium in which most of the seats are empty.' According to Ramaseshan³ and Arunachalam and Srinivasan², the main reasons for this could be the conviction of Indian scientists that Indian funding agencies and science administrators rate publications in foreign journals as better than those in Indian journals. To extend Lawrence's succinct description in the Indian context, if you publish in a top journal, you have arrived and conquered; if you publish in any foreign journal, you have arrived, and if you publish in Indian journals, you have arrived in the wrong place.

With increasing migration of Indian papers to foreign journals for whatever reason, one would expect concomitant loss of submissions to Indian *SCI* or equivalent journals, forcing them to grab whatever is submitted to them. But the statistics on the acceptance and rejection of manuscripts by better Indian journals is surprisingly different. For instance, in 1999 ten research journals of the Indian Academy of Sciences among them received a total of 2469 submissions, accepted 1242 (~ 50%), rejected 894 with the remaining 330 still to be decided. Assuming the rejection rate of Indian manuscripts in foreign journals is a modest 30%, it will translate into at least 4000 manuscripts rejected by *SCI* journals worldwide in 1992. Imagine how much effort, time and money would have been spent on these works and what was their eventual fate.

It was noted earlier that a large majority of foreign journals in which Indians publish are of variable quality and reputation, and more importantly would be scarce in Indian libraries, with most of them struggling to subscribe to even better Indian journals. The latter would preclude fellow Indian scientists from seeing and reading such publications, leave alone confirming or disputing the findings and hopefully building on them. This will defeat the very rationale of supporting research projects in India, namely to nurture and develop a scientific culture and temper in the country. If findings of Indian papers in foreign journals are confirmed elsewhere and proved illuminating and influential, Indian scientists would be largely ignorant of the same for the reason stated above. So Indian funding agencies and science administrators (managers) should not give undue weightage to foreign publications, but try to assess the intrinsic merit of one's research work.

A more important issue is whether a more responsive or proactive review process in better Indian journals could have attracted a sizable fraction of publications which now seek foreign journals, and more importantly salvaged many publications rejected at present by *SCI* journals both in India and outside. Deshpande⁶ recommends that reviewers (Indian) should play the more demanding role of a friend, philosopher and guide to the authors, rather than just a censor or regulator. It may be argued that most Indian reviewers, being busy with their own research work, would be reluctant to devote the time and effort necessary to carefully go through a manuscript, see whether it contains some substance, indicate where it is faulty or unclear, and then suggest specific steps to the author for its improvement and hopefully eventual acceptance. But is not that exactly what is expected of them when the author, often a young and aspiring scientist has put in several months, if not years, of his effort for that paper? Reviewers have a duty to help the authors, help the advancement of science in India, often from grassroots level and help journals publish useful papers.

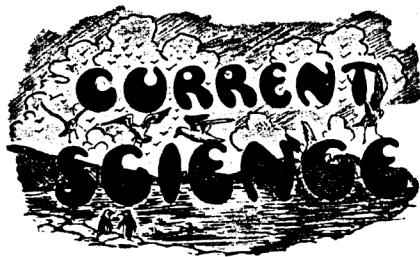
Although academy journals should perhaps retain anonymous reviews for discretionary use, they can take the initiative to encourage open peer review to facili-

tate direct interaction between reviewers and authors. The reviewer will be forced to make an objective, carefully reasoned and courteous review with a palpable intent to help rather than tear down. Rude, patronizing or demeaning remarks will be under check, as will be intentional or unintentional delays in review reports. Quite often, authors refuse to accept any weakness or alternative interpretation pointed out by reviewers. But this should be the sign of a scientific debate. The editor can in such cases use his discretion to publish both the paper and as well as the reviewer's comments (remarks), which should be a stimulating experience for the readership. There can be also other indirect or unexpected benefits. For example, the credentials of the referee mentioned at the end of a paper can be a much better index of its quality than other proxy indicators now used. International scientific community will be curious to watch our new and innovative experiment with open peer review and may even be attracted to feel 'our waters'.

In conclusion, an honest, objective, responsive, proactive and helpful review of a submitted manuscript is hard to do and takes time. It is a commendable endeavour that can be accomplished quite comfortably out in the open. It can then facilitate a friendly and direct interaction between reviewers and scientist authors specially in their early careers, that can go a long way in the nurture and development of science from grassroots level in India.

1. Lawrence, P. A., *Nature*, 2003, **422**, 259–261.
2. Arunachalam, S. and Srinivasan, R., *Curr. Sci.*, 1998, **74**, 433–441.
3. Ramaseshan, S., Quality of Scientific Journals in India, Symposium Proceedings, Indian National Science Academy, New Delhi, 1992, pp. 4–17.
4. Arunachalam, S., see ref. 3, pp. 40–51.
5. Gopal, E. S. R., *Phys. News*, 1988, **19**, 61–64.
6. Deshpande, J. V., Quality of Scientific Journals in India, Symposium Proceedings, Indian National Science Academy, New Delhi, 1992, pp. 52–60.

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 Vol. XI] MARCH 1942 [No. 3

Sir William Henry Bragg, O.M., F.R.S.

BRITISH Science loses one of its most distinguished leaders in the death of Sir W. H. Bragg 'full of years and of honours' on the 12th of March 1942. Born in Great Britain and educated in the Isle of Man and at the Cambridge University, he went to Australia as Professor at the University of Adelaide in 1885 and by his work there won his election to the Fellowship of the Royal Society in 1906. He returned to Great Britain in 1909 as Professor at the Leeds University, moving to the University College, London as Quain Professor in 1915. He resigned this chair in 1923 to take up the Directorship at the Royal Institution, a position which he continued to hold till his death at the age of nearly 80 years.

There are many interesting references to Sir William Bragg and extracts from the correspondence which passed between him and Lord Rutherford in Eve's biography of the latter. These throw a vivid light on the scientific interests of both men and their influence on each other. The earliest reference dates to the year 1895 when Rutherford visited Bragg at Adelaide while on his way from New Zealand to Cambridge to join as a research student under J. J. Thomson! Thus, in a sentence, are linked the names of a trio who symbolised British physics in the first three decades of the twentieth century, just as the trio Kelvin, Stokes and Rayleigh symbolised it in the last three

decades of the nineteenth century. One has only to recall the names of these men and their achievements to realise the tremendously rapid development of physics during this epoch and to appreciate their share in creating the objective or experimental basis on which the structure of physics rests at the present time.

The enormous interest excited by the discovery of radio-activity and by the early investigations of the Curies and of Rutherford appears to have been responsible for galvanising the Adelaide Professor into a career of research activity. Indeed, till 1912, the scientific interests of Bragg appear to have centred largely on radioactivity and the ionising radiations produced by it. . . .

The epoch-making discovery of the diffraction of X-rays in crystals made in 1912 by Laue had the effect, not only of convincing Bragg of the error of his views regarding the nature of X-rays, but also of setting his feet on the path of research which earned for him the award of the Nobel Prize for Physics in 1915 jointly with his son W. L. Bragg. In the special number of *Current Science* entitled 'Laue Diagrams' published in 1937, the story of Laue's great discovery and of its subsequent developments has been told in full by the leading authorities on the subject. It is therefore unnecessary here to recapitulate this well-known chapter of modern scientific history. The recognition of the importance of the work of the Braggs in this field was to no small extent aided by the publication of their joint work entitled 'X-rays and Crystal Structure' which appeared in 1915 and went through several editions. A smaller book entitled 'An Introduction to Crystal Analysis' by W. H. Bragg published in 1928 was also a useful treatise of a more popular kind. . . .

My first personal contact with Sir William Bragg was in the summer of 1921 when I visited him at his laboratory at the University College in London. He showed me a model of the naphthalene crystal on which he was then at work and

which he made the subject of his Presidential Address to the Physical Society later in the same year. I next saw him when I was in London in the summer of 1924 prior to the visit of the British Association to Canada in that year. Bragg was then at the Royal Institution, still greatly interested in his organic crystals. He had Muller, Shearer and others with him hard at work preparing the long-chain aliphatic compounds and studying their structure. Bragg seemed to be much happier in the atmosphere of the Royal Institution than at the University College. Possibly he had enough of University teaching and examinations after doing them for nearly forty years! Bragg presided at my lecture on the Scattering of Light to the British Association at Toronto. We were in the same train together travelling across Canada to Victoria and back. My contacts with Bragg on my subsequent visits to London in 1929 and 1930 were very brief.

Sir William's laboratory at the Royal Institution has been for many years a place of pilgrimage to X-ray workers from all the world over. My own personal impression derived from such contacts as I had was that Sir William was a very unselfish and loveable personality, anxious to help others forward in their work. He had, of course, his limitations, one of which was, I think, an insufficient appreciation of the newer viewpoints in theoretical physics. But this was not surprising, seeing that he belonged quite as much to the nineteenth century as to the twentieth.

Like 'J.J.' and Rutherford, he lived to achieve the highest honours which a British man of science could hope to achieve in his own country, namely the Copley Medal, the Presidentship of the Royal Society and the Order of Merit. Curiously enough, his Knighthood was, I believe, given not for his work on X-rays, but for his studies on sound-ranging in the last war!

C. V. Raman