

late, whether useful to the community or not, the ethno and traditional medicinal data-mining and compilation have been given top priority. They are seen preaching in the fora to cash in on the traditional/ethno value in the name of Intellectual Property Rights. If so, why cannot there be some consideration for astrology, as our traditional way of belief. With such an argument we are not blindly supporting the subject, but would

like to point out that even with most of our advanced scientific efforts, we fail to predict correctly natural disasters like the cyclones, earthquakes, etc.

Accepting astrology as an Indian art/science of predicting nature, would result in development of quality astrologers, at least to satisfy the mass and to get rid of spurious practitioners and quacks from the arena. This would also pave the way for advancements in this discipline. If not

successful, this would also die in due course.

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Research impact vs economic impact

The letter by E. Vivekanandan (*Curr. Sci.*, 2001, **80**, 118–119) makes a very important point about differentiating between research impact as reflected in journal impact factors, and the economic impact of particular research projects.

He points out that certain research reported in the *Indian Journal of Fisheries* has led to significant impact on the Indian economy. He does not provide the evidence that would be needed to demonstrate the long path from the research reported to the actual technological accomplishments in the Indian fishing industry.

In his letter he cites nine relevant publications but due to *Current Science's* unfortunate policy of omitting the titles of cited papers, it is extremely difficult for the reader to determine exactly what discoveries are involved. One would need access to the original articles just

to begin to determine the connection between the research cited and the activity in industry. Research impact (meaning impact on the scientific research community) is quite different from economic impact, a subject which is of great interest to the US advocacy organization called Research!America. This has played a significant role in gaining support for biomedical research from the US Congress. Edwin Manfield and other economists have demonstrated the economic impact of research^{1,2}. This type of information ought to influence legislators in every country.

Vivekanandan refers to the 'philosophy of Garfield' – presumably an essay published in 1979. The citation's documentation is ambiguous. I believe he intended to cite my essay in *Current Contents*³ (<http://www.garfield.library.upenn.edu/essays/v4p313y1979-80.pdf>). I think this

further illustrates the potential confusion that arises from the archaic policy of omitting titles from cited references.

It is marvellous that your journal is now available on the web. Hopefully this means you can correct this inadvertent error – in the web version, at least.

1. Mansfield, E., *Res. Policy*, 1991, **20**, 1–12.
2. Salter, A. J. and Martin, B. R., *Res. Policy*, 2001, **30**, 509–532.
3. Garfield, E., *Current Contents*, #46, 12 November 1979, pp. 5–10; Reprinted in *Essays of an Information Scientist*, 1979–1980, vol. 4, pp. 313–318.

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Facts that are ignored in academic recognition-making

One would fully agree with the correspondence 'Recognition of contribution of a person should be one-time affair' (*Curr. Sci.*, 2001, **80**, 321) of Bharati Mittal and add that all is not well with the mechanism of recognition or award-making for academic excellence by different institutions. The exercise is not simple, but there is lot of scope for improvement in the mechanism by which the recognition is made. Since the number of areas in a subject in which research is being done in the country is very large, there is a likelihood that one or more

committee members of recognition-making bodies may not be aware of the top workers in a particular field who may deserve to be recognized. The mechanism is subjective too because which area attracts the attention/interest of the award making or committee members, also matters. Thus many scientists escape (I emphasize 'escape') recognition because their areas of research are not appropriately recognized.

There is yet another aspect of the mechanism of recognition-making. Outstanding or extraordinary work is well

known and people seldom fail to recognize it, but the quality and recognition of the work, which is good but second to top ranking, is always a matter of opinion. In such a case, if the person and his work have to be considered for recognition, at least one member of the committee has to know the person and be familiar with his work. This can happen only when the member works in the same area or belongs to the same department of the institution in which the person works. If one is permitted to stretch the point a little further, recogni-

tion depends on the quantum of publicity made about the person and his work.

Under such a situation the subjectivity in recognition-making is large. The quality of publications of a person has not been given due weightage in the mechanism in respect of the reputation of a journal in which the publication is made, because it is the journal which determines the quality of work. Incidentally, this could be one of the criteria for recognition even for a non-expert, provided the journals are categorized by a committee of experts with appropriate weightage in each category. By this one does not mean that this should be the sole criterion, but that this could be a foolproof criterion to some extent. Hence, attention with due weightage to the journals of publication should be given for making the recognition. The impact factor of a publication, which is given weightage presently for any consideration of recognition, is objective, but this also suffers from the prejudice of current popularity/demand or like/dislike of a subject rather than depending on the quality of work based on ingenuity, precision, critical analysis

and thoroughness. The impact factor of a publication does not necessarily reflect the true quality of work. All that one can say is that it has credibility under the circumstances. Hence undue weightage to impact factor overplays the quality of work, so that one can say that if at present any consideration is being made for publication, it is not truly objective.

The number-factor has its role too in determining the quality of work. How is one going to make an assessment of the quality of work when the number of committee experts is fewer and the number of areas of research is much larger? It is then the quality or reputation of the journals and the number of publications in them that determine the quality of work. Several workers in Chemistry (I know of this subject only) with several good publications have been left out in comparison to those recognized with lesser publications. To elaborate the point further, persons with three/four publications in the journals of *American Chemical Society* or *Chemical Society, London* or equivalent journals, have been recognized in preference to or in absence of

knowledge of persons with sixty/seventy publications in the same journals. Can difference in the area of work matter to such an extent for the quality of work?

Apart from research, one area which has so far been ignored for recognition, is scientific education. One who spends his life in spreading, propagating or creating an awareness of science in masses or in innovating science education at secondary/undergraduate level, should also be considered for recognition by the highest scientific body in the country. Bharati has rightly pointed out this fact in her letter. It is therefore necessary that all awards/recognition-making institutions or bodies should strike a balance amongst various areas of recognition in a subject, including that of scientific education and adopt some objective criteria, e.g. the quality of publication in terms of category of journals to compensate the subjectivity of the mechanism of recognition.

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Improving research in India

Y. K. Gupta (*Curr. Sci.*, 2001, **80**, 808) has given some suggestions for improving research in India through spiritual 'Karma'. His solution can prove to be helpful in a limited way, e.g. at the project level dissertation in a professional course. Peer review is always helpful for budding researchers. There is no substitute for general facilities and infrastructure for carrying out research at the international level. An up-to-date library, laboratory and workshop are necessary for experimental research. But the competence of the investigator-in-charge or the research supervisor cannot be ignored. What we need the most for promotion of

research in Indian universities is networking of research groups with national laboratories where library, laboratory and other infrastructure facilities are available in abundance. DST and other funding agencies must evolve a strategy for networking the research centres. A lot of money can be saved in this way by joint collaborations. All major research projects should be sanctioned only after a thorough survey is made about the infrastructure facilities available with the principal investigator.

It is also pertinent that Indian journals should improve the standards of peer review as suggested by Gupta. I feel that

there is a lot of personal bias which discourages young researchers to publish in Indian journals. There are no competent reviewers in some emerging areas of research. As a matter of fact, when an Indian reviewer rejects our paper, we publish it in a foreign journal of repute as its quality is improved in the review process.

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Need for popular science books

Popular science books play a crucial role in kindling the scientific attitude, outlook and perception towards pursuing a scientific career. I fully agree with Dilip Salwi's views (*Curr. Sci.*, 2001, **80**, 331–332) that in India popular science books have still not caught on among the young

as well as the general readers. A lot is desirable in this front to popularize reading as well as publishing of quality popular science books.

In general, these books can be classified into two categories – one which caters to the young readers between 6 and

17 years and the other for general readers of any age. Scientists like Feynman, Paul Davies, Stephen Hawking, Penrose, Capra and many more have benefited millions by their books, as they had visions to popularize science among the laymen and understood the importance of populariza-