

llence among its workers and not mediocrity. A scientist's quality is usually assessed based on his publications. But the number of publications alone cannot be an indication of a scientist's capability. One should see the impact of the paper and even of the journals. Certain areas of social importance may not have much potential for publication in reputed journals. In such cases, alternative methods of assessment have to be worked out.

A related problem is that of scientific ethics. While the number of cases of blatant violation of scientific ethics exposed in India is not very large compared to that in other countries, what is suppressed appears to be much more. Favouritism in every aspect, from selection of Ph D students and valuation of their theses to recruitment of researchers and assessment for promotion, often goes without even a whisper of protest. Scientists have to urgently and seriously address the issue of fudging of data and other misdemeanours.

(iii) *Working environment*: Many scientists often feel that the environment in

Indian research institutes is not very conducive to creative work. Money is *not* often the main constraint. Widespread complaints are more about time delays in obtaining materials or getting the work done, overly restrictive administrative practices, low priority given by government officials to matters related to research, and so on. The government should initiate positive steps to attract private funding for research. Regarding job promotions, in spite of the efforts taken by the CSIR in streamlining the assessment promotion procedures, there still exists considerable discontent. Maybe it is necessary to completely recast the system and have a series of discussions at various levels.

(iv) *Attracting talent*: Even premier institutions like the TIFR are finding it difficult to find good staff for their projects. It appears that the younger generation is moving away from science into commerce, business administration and other lucrative fields. C. Subramaniam had suggested that the old Science Talent Programme be resurrected. If selected candidates have to take up science as a

career, there has to be some assurance that they would get employment in the future. It may not be a bad idea to provide jobs for these candidates every year, of course, subject to the condition that they eventually qualify for the post. If we can have selected cadres in Administration, Police, Forest and even Engineering Services, why not for Science also?

I hope the scientific community will consider these suggestions. A committee consisting of senior and young scientists, university teachers, academicians, bureaucrats and management experts could be constituted to initiate discussions at various levels that would lead to a national consensus on these issues. In any case, it is high time something is done about the problems in the S&T sector if India is not to fall far behind the other developing countries.

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## Issues regarding S&T in India

The articles in *Current Science* (2000, 78) by P. Balaraman (pp. 365–366), K. N. Bharadwaj (p. 368), M. Mukul (pp. 368–369), and G. Padmanaban (pp. 381–382) raise the following issues for the *immediate attention* of organizations like DST, UGC, CSIR, ICAR, ICMR, universities and research institutes, industries and researchers themselves.

1. Facilities for research in various disciplines are governed by the quality of scientists recruited for the purpose. As long as equipments are properly used by scientists and students, their maintenance is usually assured by service contracts and funds from projects/institution itself.  
2. It is true that some scientists have denied to share their facilities with other users even when the equipment is almost idle due to various reasons. Joint authorship is necessary wherever intellectual interaction is involved.

3. Funding should be given to deserving scientists and not be based on mere 'contacts with right persons'.

4. Instrumentation centres in most institutions are in a bad state because qualified staff have not been appointed to design new instruments/equipments, and keep the older ones going much longer.

5. Fruitful cooperation between academia and industry can occur only if there are dedicated scientists and the industrialists are willing to use Indian technology for their products. Institutions/departments should circulate brochures mentioning their field of expertise and achievements. In the process, the academics should ensure that their academic commitments are not hindered. Institutional and personal ethics should be developed and fostered, defaulters should be dealt severely.

6. Committed teachers and scientists, and reasonable infrastructure will help to prevent brain drain.

7. Undue priorities and biased/favoured discriminatory funding without regard to quality achievements, and relevancy and just 'right contacts' will not nurture young creative minds.

8. The lack of quality teachers in various science branches in most institutions, has led to a decrease in the number of students taking up basic science for study.

9. Hence, the present system of education should be restructured with course-semester pattern and good teachers.

It is thus time for all those concerned to get together and work for rapid improvement.

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