period of the award. Thus the 'growing emphasis on impact factor' and 'other considerations' rather than the 'citation counts' is abortive and suicidal even if 'it signals a new trend in India'.

Non-emphasis on 'citation counts' in selection and other matters and also the domination of science in India by the persons who have more skills in the 'politics of research' rather than the original research and also do not have the needed courage to stand up to the authority and speak their mind like C. V. Raman, have resulted in research of inferior quality in India. Thus only when quality is preserved by emphasizing the 'citation counts' will our coun try produce many original scientists like Raman, and only then will the future of science in India be assured.

D. K. BASA

Department of Physics,
Utkal University,
Vani Vihar,
Bhubaneswar 751 004, India
e-mail: basa@iopb.res.in

Teaching research students, and scientific career vs engineering

The editorial 'Teaching research students' (*Curr. Sci.*, 2000, **79**, 262) highlights three points in particular, (1) The number of top-quality students available for research specially in physics and chemistry is declining, (2) The research institutes and universities in general have no pre-Ph D training programmes, and (3) Admission to research for a Ph D degree is solely managed by the supervisor. The editorial very rightly points out that Ph D work is a logical extension of M Sc with subsidized student life which provides time for finding a suitable job. One would have appreciated if the editorial had suggested ways and means to improve the credibility of Ph D starting from admission to its evaluation for a degree.

There is no pre-Ph D course for study perhaps in any Institute or University in the country and whatever, wherever student learns, is through informal teaching by the supervisor during the period the student works for his Ph D degree. Although M Phil is not equivalent to pre-Ph D course, in absence of the latter, UGC may consider a suitably modified M Phil course compulsory for taking admission to Ph D. UGC must also ensure that for the teaching of M Phil syllabus there are appropriate facilities of library, laboratory and faculty in the department. It would be academically safer not to permit colleges to run M Phil courses. Normally such facilities are not available in a college. Whether it is running of M Phil or of supervising research, both can be operated to some degree of success only when there is a group of teachers actively engaged in research.

It has been rightly mentioned in the editorial that of late the number of top-quality students joining the scientific career and research has been decreasing. Students always preferred the engineering and medical careers which ensured them a decent life and earning, and what was available for the scientific career was third/fourth rate stuff. To make things worse, the engineering colleges have multiplied several times. Another avenue for better and bright prospects is finance and management. It is, therefore, the academics and research that suffer. It has already been mentioned earlier (*Curr. Sci.*, 1999, **77**, 1227) that unless through a highly competitive procedure the talent of the country in required number is not picked up right after Intermediate/Twelfth standard with assured jobs after obtaining Ph D, in a cadre, say Indian Scientific Service (ISS) like IAS, future of Science in the country is not bright. Although such talented stuff may not have the research aptitude, the situation would be better than what we have at present. 'Teaching of research students' is a must even for top-quality students.

Another grey aspect of Ph D research today in our country is the admission to Ph D which is more a matter of convenience between the supervisor and the student than any academic criterion. This can be stopped to a large extent if each student for research is recruited in a funded project through selection committee. The M Phil and funded research together will eliminate/reduce the less meritorious admissions. Thus there will be two streams of research career, one by an integrated programme with an assured scientific career and a job for the top brains, and second for the less fortunate ones doing graduation, PG and research on their own.

Finally one should recognize that scientific research career suffers from one great disadvantage compared to an engineering career. The scientific career would require almost nine years (3 for B Sc + 2 for M Sc + 1 for M Phil + at least 3 for Ph D) before the student will have a settled life, whereas for the engineering career only four years are enough to secure a job and settle. Thus only the determined ones with scientific aptitude would opt for the scientific career, and the latter would not be able to attract the talent in general, unless the proposed Indian Scientific Service (ISS) has super pay-scale, perks and national recognition. This is not unreasonable since the future of the country is shaped by the scientists.

Y. K. GUPTA

J/5, Phase II
Shivalik Nagar
Hardwar 249 403, India