

## In this issue

### Reflections on research careers

Every year the arrival of the monsoon coincides with the annual admissions exercise, which selects students for doctoral degree programmes at national institutions and universities across the country. While the monsoons in recent years have generally been classified as 'good', the quality and quantity of students aspiring to enter scientific institutions appear to be declining. Rationalizing the behaviour of monsoons may require simultaneous consideration of a large number of parameters. On the contrary, explanations for the falling yield of research students may be easier to achieve. Rajagopal *et al.* analyse the factors that influence the choice of research as a career (page 326). The authors have a unique vantage point – the human resources development cell of the CSIR, which funds research students and post-doctoral associates across the country. The authors begin with a question – 'Do our young researchers make a determined effort to enter the portals of our R&D institutions with research as a career in their minds or do they gravitate there buffeted by circumstances beyond their control?' They employ a questionnaire and analyse 315 responses. (Interestingly, the response rate was ~40% out of a total of 766.) Such sociological studies are restricted by the limited sample size and the design of questions. Nevertheless, the authors conclude that 'our young researchers are fired with enthusiasm to work for the betterment of mankind and/or bring out something fruitful through their research efforts'. In their conclusion, the authors suggest that we must search for 'missing links that influence the mismatch between motivation and performance'.

There is little doubt that science as a career has become increasingly unattractive, despite the many schemes that are discussed in institutions and

committee rooms across the country. Ironically, even announced schemes are rarely implemented efficiently. The decline in the value of scholarships and the absence of rudimentary facilities at most institutions are hardly a good advertisement for science. Even more serious, is the lack of a sense of excitement in science and a general atmosphere of despondence that prevails in most universities and national laboratories. Conflicting signals put out by science administrators, who bend with every gentle political breeze, have left many active researchers wondering whether potential 'applicability' of a research area is the sole criterion for determining allocation of scarce resources or whether 'excellence' (a much abused term; 'proven performance' may be a more pragmatic alternative) is a dominant factor. The sight of laboratories flush with money, based on promise and not performance has led to distortions in the way in which science is perceived from the outside. Prospective entrants to this profession can hardly fail to be influenced. The inability of science departments of government to move decisively, and most importantly in concert, to improve scholarships, contingencies and post-doctoral fellowships reflects a crisis of leadership. Even the authors' own organization, the CSIR, starts post-doctoral associates on a stipend that is calculated to repel rather than attract the best. The bureaucracy which has so successfully advanced its own interest in successive Pay Commissions is the major stumbling block in improving conditions in other areas. Self-congratulation has become a way of life in our better-endowed institutions, an attitude that is hardly conducive to thinking about improvements for the future.

In the last few weeks, nostalgia has reigned supreme and rightfully so, since the 50th anniversary of Independence is indeed a major milestone in the passage of time. Science and technology have been developed in

great measure in India over this period, but difficult days lie ahead. Ramanna (page 319) considers one sensitive issue; the availability of adequate electrical power and champions the cause of nuclear energy. There is probably no other area of science and technology which attracts greater debate than nuclear energy. Irrespective of which side of the nuclear fence that one stands, many of the author's remarks have a general bearing on the process of decision making, that limits purposeful action in any chosen direction. The author has had a ringside view and his comments on matters 'oscillating between Finance and the Planning Commission' are a sharp reminder of the minefield of bureaucracy that has to be negotiated even before a project begins. His view, 'that this is done as a part of the governance that you have two bodies always at variance, to postpone the issue when the government is unable to take a decision', will strike a chord in all those who have participated in multiple committees, which keep us apparently active but generally stationary. The execution of many critical (and inordinately delayed) projects in diverse areas, requiring inputs of highly trained technical manpower will be jeopardized if there is a continual fall in the quality of scientists and engineers entering national institutions. The flight of engineering students of all disciplines to financial and marketing management and software industries is a reflection of the times. The declining entry to all programmes, even well established ones like the DAE's training school must be a cause for concern.

The articles by Rajagopal *et al.* and Ramanna in this issue, although unrelated, should stimulate thinking on future directions in both research and education in all areas of science and technology.

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