A Fine Balance

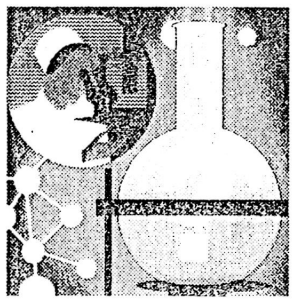
Creativity as Cornerstone of Science

By J V Narlikar

The dawn of Indian Independence saw the beginning of a new scientific infrastructure. Homi Bhabha founded the Tata Institute of Fundamental Research from which emerged India's atomic energy programme, while Shanti Swarup Bhatnagar initiated the CSIR which has mushroomed into a string of sophisticated laboratories serving as links between science and industry.

This development saw also the beginning of a new creature, namely an autonomous research institution (ARI). An ARI ideally was meant to be an autonomous body whose functioning was optimised with respect to its scientific output. That is, its rules and by-laws would be such that they would help rather than hinder scientific creativity. Today, more than five to six decades later, with a large number of ARIs around, where do we stand with respect to this basic requirement?

An ARI is typically funded by a department of the government, more often the Central government than a state government. It has its own rules and by-laws to decide how it is run. To set it apart from a government department, its hierarchical framework has a governing board or a council to manage its major programmes while its day-to-day running is looked after by a director. It makes a five-yearly projection for each plan period and gets its budget approved annually by its apex body.



However, nice though all this may read on paper, the reality is not exactly matching. A look at the grades and pay structure of the scientists of an ARI would show that they run parallel to those of the administrative services. Thus the scientist can find identical grades of the secretarial ladder with rungs like deputy, joint, additional, etc. This presupposes that the career development of a scientist is similar to that of a bureaucrat. This assumption does not include the early rapid rate of creativity of a young scientist, which slows down with age. Thus our pay and promotional structure should be such as to reward the highly productive young scientist in contrast to a plodder.

Scientists are meant to have an informal style of functioning with the canteen coffee table the place for scientific gossip and free exchange of ideas. But those who take the above grade structure seriously immediately become formal.

In fact, the way the finance people look at the functioning of an ARI, the rules are of no relevance where they dare to differ from what operates in the government. And so the original vision in creating these institutions is getting blurred with time.

To be really autonomous, an ARI should be given considerable flexibility of operation within a specified budget. The flexibility relates to pay structure, promotions and the freedom of decision-making where scientific projects are concerned. As indicated earlier, the pay structure must be such as to encourage a high level of creativity with rapid promotions while at the same time keeping a non-achiever in a stagnant mode. The director should be able to delegate a lot of responsibility to junior colleagues. Since different scientific institutions attack different research problems, their modus operandi need not be exactly similar.

Lest I appear Utopian, let me also add some dos to the other side of the balance. The purpose of providing flexibility and autonomy is to enhance the creativity of the scientists working there. This has also objectively to be gauged. How many ARIs today have external scientific monitoring? One of the few exceptions, is the Inter-University Centre for Astronomy and Astrophysics, which has an external scientific advisory committee visiting every 18 months. Such monitoring should help weed out deadwood and move from unproductive to productive lines.

If I were to create an ARI today, I would eliminate the peon or other class IV staff. A bit of self-service by the scientists and senior administrators (routinely practised in the advanced countries) will do no harm. In the days of self-drive, why must we still retain fleets of staff cars? Let staff members drive their own cars and if on official duty, they can be recompensed.

Another thing I would do away with is directors with many hats. The director's is a full-time job. Even though he be an NRI of the Nobel laureate class, having him as part-time director while the rest of his time is spent abroad, does not help the institution. Nor does it help if the director is also holding other responsibilities in the country that take him away from the institution for extended periods.

Likewise, one should avoid creating an ARI to please the ego of some senior scientist, when otherwise there is no rationale for creating the institution. And, finally, I would not create an autonomous institution if it did not have an intimate link with the local university or college. Scientists in such an ARI would not be appointed or promoted if they did not teach at least one course in the local college or university. The self-imposed isolation of the existing ARIs from the vast student population in the country is depriving the latter of exciting glimpses into frontier science while the former are running short of new talent.

I believe we need seriously to rethink the entire scientific and research framework in the country to see how it can be made more creative. And a beginning should be made by taking a second look at the existing ARIs.