Indian science?

by Jayant Narlikar

While looking towards the future, it helps to look backwards first, to see how Indian science has fared during the 20th century. What were its top 10 achievements? Could our overall performance have been better? Were any crucial decisions taken wrongly? Can we use the pointers from the past and trends at the present to plan for the future?

There has been, it will be noticed, a shift since Independence from the individual to the organized science. Leaving aside the hype of ‘third largest scientific manpower’, Indian scientists have individually done well, even excelled in their chosen fields at international level.

Nevertheless, there is no room for complacency. We could have done better, given the pool of talent and intelligence we started with at Independence, given the first prime minister who understood and appreciated the role of science and was willing to support its advance wholeheartedly, given the respect science enjoyed amongst the bright young students of the time. But we didn’t. Why?

It is easy to pretend to be wise after the event. After all we realise that a wrong turning has been taken only after we go down the road some distance. So here are my answers to the “Why?” with the disclaimer that, right or wrong, I am speaking only for myself.

The significant step taken around the time of Independence, to increase the ambience of science in the country, was to set up autonomous research institutes (ARIs) in various research areas. The Tata Institute of Fundamental Research (TIFR), set up in 1946, set the tone. The TIFR initially sent scientists for training abroad, in the West, but with the aim that subsequently the institute will be self-sufficient in this respect. This aim was fulfilled, and eventually the TIFR provided the intellectual material for the country’s atomic energy programme. The CSIR society also worked in the direction of self-reliance by creating advance laboratories in different fields all over the country.

Today, we have a large network of ARIs created by the various scientific departments of the Government of India, the DAE, DST, DSIR, DOS, DRDO, DOE, DBT, etc.

Looks good? But here is the catch: none of these ARIs has any integrated link with any university, even if the university is in the same town. So, except for their very limited research scholars, these ARIs have no exposure to the student population. Contrast this with research in several advanced countries where top-class research is carried amidst the ambience of a university with the distinguished scientists sometimes lecturing to the undergraduates. Being lectured to by high achievers can be very inspiring and motivating to a student: even seeing the distinguished scientist on the same campus as you can have a salutary effect. I can speak from personal experience, having attended lecture courses, by Paul Dirac and Fred Hoyle at Cambridge and seen G.P. Thomson on the river toepath or Max Perutz chatting in a café.

While creating the ARIs the primary consideration must have been to provide a hassle-free environment for dedicated research, far from the madding crowds of university dons and rowdy student masses. It was like the Indo-Pak test match at Calcutta’s Eden Gardens from where all spectators were banished.

By and large students do not find a scientific career attractive because they know that if they opt for a bachelor of science stream, there is no excitement, no motivating teachers anymore. Simultaneously with the creation of the ARIs, the downgrading of our once excellent university system also began. Take any old university of today and compare its academic and scholarly ambience with what it was 60-70 years ago. The difference is too obvious to comment. As opposed to the ARIs who were divorced from teaching, the successive acts ruling universities made them more and more teaching factories where the workers’ hours are counted by bureaucrats each time a pay revision takes place. When merit, as a criterion for selection, goes out of the window, we have no reason or justification to demand that a university should produce quality output.

Looking towards the coming centuries, if we were to learn from our past mistakes, the following operational changes are necessary. First there should be a close interaction between the ARIs and universities, with the scientists from the former lecturing to the students from the latter, and the faculty and students from the latter being given opportunities for participating in frontier research at the former. Second, scholastic merit must be seen to be reassessed in the university evaluation. And third, which I did not so far touch upon in this article, our scientific institutes should depart from the pay structure which parallels that of administration and an evaluation scheme which is not adventurous enough to recognize and encourage merit at a young age. For, the evolution of a scientist is markedly different from that of a bureaucrat. In short, we have the talent, we see the goals clearly, what is needed is a change of environment.

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