

mental processes would certainly aid rational development of drugs and vaccines. It is often good fundamental research and a prepared mind that would lead to applications. Furthermore, fundamental research is necessary to thoroughly understand the pathogens in order to combat them on a long-term basis. In countries like India where infectious diseases are endemic, such research becomes a national priority.

Fundamental research on microbial pathogens has been dealt with above only as an example. As R. Chidambaram, the Principal Scientific Advisor to the Cabinet, has indicated in his enunciation of what he describes as directed basic research, similar opportunities can be found in every sector of our developmental agenda¹.

It is often rhetorically asked as to when an Indian working in India would get a Nobel Prize. As Venki Ramakrishnan, a Nobelist of Indian origin, has mentioned, getting Nobel prizes is not the objective. The objective should be to raise the overall standard of Indian science. When the overall level is high, peaks are more likely to emerge. As I had argued earlier, reforms in the structure of Indian science and the educational system are a pre-condition for substantial progress²⁻⁵. But they are not enough. It is important that we develop more self-confidence and become less dependent on the approval of colleagues

in the West for doing our own thing. Undoubtedly, the centre of gravity of modern science is still in the West and we have much to learn from the pursuit of science in developed countries. However, after careful consideration, we have to choose our problems and approaches ourselves and stick to them on a long term basis. Indian scientists who have made a global impact are those who have done so. As a corollary, we have much to learn from non-resident Indians and we need their help. However, Indian science, as it exists today, has been built up by scientists who remained resident, often braving difficult circumstances. What is required is to improve the conditions for the pursuit of science in India so that residents become more productive and non-residents are encouraged to return.

Science derives its strength from plurality in its practice. Ramanujam, the mathematician, was an all-time genius. It is futile to search for a national relevance to his activities. We can only rejoice that India produced a colossus like him. C. V. Raman was among the founders of modern physics. He was also a great mentor. J. C. Bose consciously remained an academic scientist. His contemporary P. C. Ray, on the other hand, made pioneering contributions to Indian industry. All these and many more different strands went into making the vibrant fabric of Indian science in the pre-independent era. The same kind of plurality continued

to be the hall mark of Indian science after independence. Some, like G. N. Ramachandran, concentrated exclusively on excellent research. On the other hand, leaders like Bhabha and Bhatnagar were great institution builders. Bhabha, a distinguished theoretical physicist, stopped his personal research to devote himself fully to institution building and national science leadership. There are many who combine excellent personal research and an effective leadership role. Some consciously orient their research to cater to the national requirements. Such an orientation of effort need not necessarily involve a compromise in quality. If it is perceived by some as a compromise, it is a price worth paying for contributing to the advancement of an emerging country like India.

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Headhunters needed

While commending Gowrishankar's¹ suggestion to consider performance-based funding, I would like to state that a panel of scientists may be set up to spot talent, especially among the youth. This should be done by constant screening of journals, Indian and foreign, to see who is publishing what from various institutions in India. And if found worthy, encourage them to further develop their research through funding and advice. Many a times, just a letter of encouragement may be sufficient to give the initial

push. In my period of stay in a private medical institution in India, I met a young pharmacologist who almost synthesized 'artemisinin' by an alternate route, but gave up due to lack of encouragement from his peers (B. K. Rao, pers. commun.). A young biochemist who found evidence of cyanide-resistant electron transport in amphibian endothelium (and published a couple of papers²) gave up research to take up a bank job because she could not get a teaching job. I think it is time to set things right.

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