

A few years ago, grants to IITs from the Central Government were nearly frozen at the then-prevailing levels. Fortunately, at the same time, bureaucratic difficulties in encouraging, generating and accepting donations for IITs were removed. Thus, it became possible to secure substantial donations from alumni, some of whom have prospered particularly in the fields of finance, information technology (IT) and biotechnology.

The Prime Minister recently stressed the need for doubling the allocation for research and development to 2% of Gross Domestic Product (GDP), for giving adequate recognition to active scientists and technologists, and for motivating them to give their best to their country. Hopefully, these ideas will be implemented soon in spite of claims of financial stringency. In addition, some serious problems on the ground need to be addressed. Important decisions are taken by a small number of influential scientists and/or their protégés who continuously dominate the committees deciding research grants and awards.

Reasons for non-approval/rejection of a research proposal are rarely, if at all, given and large projects are not always decided on the basis of transparent and objective criteria.

The IIT brand has by now acquired tremendous 'market' value. Students educated at great expense by the Indian taxpayers settle abroad and contribute only to the 'brain bank', as evocatively described by some influential policy makers. In a sense, the IITs succeeded so well in one of the originally allotted tasks that this very success has perhaps given rise to some major problems, at least in the short term.

Sometimes one hears a criticism to the effect that the IITs have not contributed adequately to research and development efforts judged as outstanding and relevant by national/international standards. Perhaps it is not realized that research funding is not adequate by international norms, generally less than a few thousand dollars on the average per institute faculty member per year. Thus the research students and staff members are not able to show

major breakthroughs and lose motivation at least to some extent. There is no strong tradition of support from industry and/or large government-funded laboratories for research work in universities or institutes. Active steps from the Prime Minister will be helpful in correcting some of these deficiencies and the nation will then also be able to demand accountability from the IITs on the research front as well. Of course, adequate funding is only one of the prerequisites for a successful research programme. Imaginative formulation and execution of the research effort by dedicated workers is equally necessary for competitive output. Indeed, we have a long way to go before actual results will be visible even after improvements in the research environment.

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Jagadish Chandra Bose: The first modern scientist

In his otherwise engaging review of the book *Jagadish Chandra Bose: The First Modern Scientist* written by Dilip M. Salwi, the reviewer has questioned Salwi's calling J. C. Bose the first modern scientist¹. He adds 'P. C. Ray and young Ramanujan are other equally familiar names'.

Though Salwi has said nothing² about the subtitle of the book, one can assume that he (Salwi) has rightly labelled Jagadish Chandra Bose as the first modern scientist, considering the period of the important research work carried out by these three scientists, keeping aside their dates of birth, period of their foreign recognition, etc.

Though Jagadish Chandra Bose (born in 1858) was elder to both P. C. Ray (born in 1861) and S. Ramanujan (born in 1887) age alone should not be considered while labelling someone first in any field.

As far as foreign recognitions are considered P. C. Ray was not elected as Fellow of the Royal Society. He had gone abroad in the pursuit of higher study in the year 1882 and returned in 1888, while J. C. Bose journeyed for the same purpose in 1879 and returned in 1885. The major contribution of P. C. Ray³ to chemistry is the discovery of mercurous nitrite in 1896, while J. C. Bose demonstrated his world-famous experiment on wireless communication (which was also the first in the world) in 1895.

Although S. Ramanujan was elected Fellow of the Royal Society, London, earlier to J. C. Bose, it must be remembered that S. Ramanujan was not even born when J. C. Bose was appointed as a professor in 1885. J. C. Bose demonstrated his experiment in 1895 when S. Ramanujan was a mere 7–8 year-old.

The first Indian FRS was Ardaseer Cursetjee⁴ (elected in 1841). So the hon-

our of being the first modern scientist should perhaps go to Cursetjee. But he was a shipbuilder and an engineer. Why, then, should we deny the honour to J. C. Bose?

1. Bhattacharjee, S. K., *Curr. Sci.*, 2002, **82**, 1492–1493.
2. Salwi, Dilip M., *Jagadish Chandra Bose: The First Modern Scientist*, Rupa and Co, New Delhi, 2002.
3. Ray, P. C., *Life and Experiences of a Bengali Chemist*, Chakrawarti and Chatterjee and Co, Calcutta, 1932.
4. Kochhar, R., *Curr. Sci.*, 2001, **80**, 721–722.

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