

howsoever amorphous, and some among them genuinely accepted as natural intellectual leaders, not just as individual scientists working with a laboratory assistant or a few students. The more significant scientific pursuits had already begun demanding group activity then. The apparent decline, therefore, is the inability of the likes of Boses and Ramans of today to lead teams to contribute first-rate work in joint ventures before others do it. We can do it all, though perhaps inefficiently, but only after others have shown us how to work together, that too only in technology, but not in pure sciences. So in spite of successes we lag behind, be it in nuclear, and space science, biotechnology, etc. And in basic sciences excellence is judged purely through global competition, unlike in technology. The point to be realized is that team spirit, that entails genuine appreciation of each other's skills, is not our cup of tea. I strongly feel that the root of the problem is in our basic philosophy that majority live by. It is 'Moksha' (personal emancipation) that we adore and glorify, unwittingly sanctifying selfishness in general, as a great virtue. Tagore had made this point way back in 1934 in a slightly different context and tone, with clarity characteristic of him. I give below a free translation (mine) from the text of the address² that Tagore delivered to a literary gathering outside Bengal, commenting on the reason for excellence in Bengali literature, transformed by the likes of Raja Ram Mohan Roy, Madhusudan Dutta and Bankim Chandra Chatterjee: '...Even today, also in modern literary activity, Bengalis' degenerate mind, eloquent in

slanders, is ever alert to mercilessly inflict painful insults at which they are extremely skillful.... This strange self-degrading zeal of Bengalis would have torn to pieces their own literature, carry her to the great funeral pyre in the cremation ground of dead literature, shrieking abuses to each other on their gleeful march singing the last rites – but *since literature is not a cooperative business venture, nor a joint stock company or a municipal corporation, and since she inspires solitary single travellers, managed to escape all kinds of assaults hurled at her.* The jealousy-prone Bengalis rejoice today because they are witnessing their *only successful adventure*, that is, in literary creativity...'.

The emphasis is mine to draw attention to the fact that Tagore was in regular correspondence with J. C. Bose, and knew the scientific contributions of other Indian stalwarts of his times as well. But he knew what was happening in science in the rest of the world too. That may be the reason why he singled out literary activity explaining the reasons for its success, for Tagore must have been aware of how group-fights were leading to the decline in scientific activities in the country.

Our dominant cultural traits thus continue to limit achievements in all spheres of our activities, not necessarily in identifiable sets of individuals as in sports teams or political groups, but also in amorphous groups of researchers in any discipline. In institutions of the West, one can find a number of great minds moving under the same roof for years, but it would be a miracle if it were to happen in India. Raman's style of science management in

India was a deterrent to Chandrasekhar Subramaniam's return. One must read his biography by Kameshwar Wali³ for more details. Our group activities do not match those of others because of mutual suspicion, rampant sycophancy, meanness, and above all a deep-rooted belief that the means of acquiring personal fame or position does not matter, even if it degrades joint ventures. That has naturally compelled arbitration by outsiders such as politicians and bureaucrats to streamline functioning of institutions of higher learning. Academics should have known better how to manage such institutions, for they, and not politicians and bureaucrats, teach management to young minds. Obvious damage is the lack of respect for academicians amongst students – the first step towards decline! Students do not witness any team spirit worth emulating and rarely, if at all, find a role model while acquiring their degrees.

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 2. Reproduced in *DESH*, Ananda Bazaar Patrika, Kolkata, 2 November 2004, pp. 41–43.
 3. Wali, Kameshwar, C., *CHANDRA: A Biography of S. Chandrasekhar*, Penguin, 1987, pp. 247–307.
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Water resource planning and management

This refers to the article on water scarcity in India¹. The water scenario is going to be the most serious problem that the country will be facing in the 21st century. The total demand for water has been projected as 400 km³. Total annual precipitation in India is about 4000 km³. Ground-water contributes 70–80% of agricultural produce in India, about four-fifths of the domestic water supply in rural areas and about 50% of urban and industrial uses. From the estimated utilizable freshwater

resources of about 1130 km³, only less than 600 km³ has been put to use at present. Climatic changes account for 20% increase in water scarcity and balance 80% is due to population increase and economic developments resulting in water pollution. Demand for freshwater by the industrial sector rose from 3% in 1990 to 4% in 2000 and will be up to 11.5% in 2025. The share of irrigation demand is projected to decline from 84% in 2000 to 73% in 2025. According to the latest census, India's

population is about 1020 million, which is projected to go up to 1333 million by AD 2025 and further to 1640 million by AD 2050. It is projected that the per capita water availability in India may reduce to about 1200 m³/year by 2047. For feeding a population of 1.64 billion, nearly 450 million tonnes of food grains would be required by the year 2050, production of which would be a gigantic task considering the constraints being faced in the irrigation sector, including irrigation water resour-

ces. The agricultural sector had 26.8% share (growth rate 7.2%) in natural GDP in 1998–99, which fell to 25.5% (growth rate 1.3%) in 1999–2000. In 2000–01, this sector recorded only 0.2% growth rate in the overall national GDP of 5.2%. The Government of India, from 1990 onwards, set aside substantial budgetary provisions for the ‘National Watershed Development Programme for Rainfed Areas’, which focused mainly on the delivery of technical inputs through government machinery on agriculture lands. To mitigate the adverse impacts of water pollution, suitable

measures are to be evolved through comprehensive water management studies. The change in human attitude towards water resources is also important as the resources are not unlimited and moreover they must be preserved for future generations. Another important step can be the interlinking of all rivers flowing within the Indian territory. Unless we take into cognizance the intensity of the water scarcity, nothing will happen. States with flowing rivers must behave with a level of maturity and the Centre should act as a mediator. In this way water could reach

every part of the country and droughts may be prevented.

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Impact of lifting ban on sale of non-iodized salt

Iodine deficiency disorder (IDD) is the single largest preventable cause of mental retardation in the world today. In India, surveys conducted in 34 states and 4 union territories have revealed that out of 312 districts, 254 districts are endemic to IDD¹. Government of India (GOI) adopted the policy of Universal Salt Iodization (USI) in 1984 under which the entire population of the country is to receive edible salt with a minimum of 15 ppm of iodine². To ensure the further success and strengthening of USI, the GOI in 1998 implemented a central legislation banning sale of non-iodized salt for edible purposes in the entire country. In the year 2000, due to administrative and political compulsions, the GOI withdrew this central legislation³. Thereafter, the traders started procuring and selling non-iodized salt for edible purposes.

A decline in the production of iodized salt has been documented after the withdrawal of the central ban on sale of non-iodized salt for edible purposes. The country's production of iodized salt decreased from 4.7 million tonnes in 2001 to 3.6 million tonnes in 2002 and then in-

creased to 4.2 million tonnes in 2003 (ref. 4). Simultaneously, an increase in the percentage of population consuming iodized salt with inadequate quantity of iodine has also been documented. The National Family Health Survey-2 conducted in 1998–1999 revealed that 50% of the families were consuming salt with iodine content less than 15 ppm⁵. In 2002, a repeat assessment of iodine content of salt in country under the National Reproductive and Child Health Survey revealed that a higher percentage (63%) of the families were consuming salt with iodine content less than 15 ppm⁶. The epidemiological data indicates that the lifting of the central ban on sale of non-iodized salt for edible purposes is undoing the success achieved under USI programme for elimination of IDD in the country.

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 5. National Family Health Survey – 2 (NFHS-2), 1998–1999, International Institute for Population Sciences and ORC Macro, Mumbai, Ajanta Offset and Packagings Limited, New Delhi, 2000, p. 277.
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