

## Homi Bhabha and Reflections on the Administration of Science

1966 was an unhappy year for India. The 'green revolution' was still to materialize and food shortages were a difficult reality. A war with Pakistan had just ended. The Prime Minister Lal Bahadur Shastri died suddenly at Tashkent, on January 11, a few hours after signing a declaration that was to herald an uneasy peace on India's borders. A few days later, on January 24, Homi Bhabha, the head of India's Atomic Energy program died, when an Air India flight crashed on Mont Blanc. I was reminded of that turbulent year when a senior colleague drew my attention to a lecture delivered by Bhabha at a meeting of the International Council of Scientific Unions (ICSU), held at the Tata Institute of Fundamental Research (TIFR) in Bombay. The lecture entitled 'Science and the Problems of Development' was presented on January 7, Bhabha's last major appearance before his tragic end. The copy I received was a version, presumably distributed on that occasion, printed at the Onlooker Press in Bombay. But, in these days of the Internet, it was not long before I discovered that the entire text had indeed been published in *Science*, almost immediately in the February 4 issue (1966, **151**, 541–548), with a footnote by Frederick Seitz, the then President of the US National Academy of Sciences. Seitz noted that Bhabha 'addressed the assembly on the role which science can and should play in a developing country such as India. To those of us who knew Homi Bhabha and his dynamic nature it was apparent that he was undertaking the task with even more than his normal vigor. During the address he spoke with a species of intensity that was unusual even for him'. Reading Bhabha's lecture over four decades later, I am struck by how much of it is relevant even today; although the world has transformed in a manner that could hardly have been anticipated in the 1960s, at the height of the Cold War, which was a major driver in the growth of science and technology in the West.

Homi Bhabha viewed science in India from a unique perspective. By 1966 he was clearly the most remarkable builder of scientific institutions in India. The TIFR was formally conceived by him in 1943 and quickly came into existence in 1945, supported by the Sir Dorabji Tata Trust and the Government of Bombay. He was quick to

persuade Jawaharlal Nehru and the government of newly independent India to set up the Atomic Energy program in 1948; an initiative that came in a surprisingly short time, after the military applications of atomic energy were demonstrated in horrific fashion at Hiroshima and Nagasaki. Between 1940 and 1945, Bhabha was at the Indian Institute of Science (IISc), Bangalore. In his biographical memoir, Lord Penney quotes M. G. K. Menon as describing this time as 'the period when he [Bhabha] found his mission in life; when he became aware of the role he would play in the development of India' (*Biographical Memoirs of Fellows of the Royal Society*, 1967, **13**, 78–97). One of the most readable accounts of Bhabha's role as an institution builder is by R. S. Anderson, which describes the contrasting approaches of Bhabha and Meghnad Saha (*Building Scientific Institutions in India: Saha and Bhabha*, McGill University, 1975). Anderson's analysis read over three decades after its publication is still valuable in providing insights into the evolution of TIFR and the Saha Institute of Nuclear Physics over the years. In a thoughtful concluding section, Anderson addresses the problem of 'dual loyalties in a divided landscape'. Here he refers to the competing demands of 'the necessities of organizing scientific institutions to do research of international standards' and 'the political needs of the people and their government to the development of the nation' (p. 98).

Bhabha's 1966 address to the ICSU General Assembly is particularly relevant today as we worry about the growing bureaucratic stranglehold on scientific institutions and the problems of dramatically expanding the science and technology infrastructure in the country. Even as we contemplate the problems of creating dozens of new institutions and raising significantly the output of scientific research, Bhabha's presentation, made over 40 years ago, merits re-reading. He describes the different paths taken by the Department of Atomic Energy (DAE) and the Council of Scientific and Industrial Research (CSIR). Bhabha notes that the device of setting up CSIR as a 'Society with a Governing Body' freed it 'from recruiting its staff through the Union Public Service Commission, whose methods are both time consuming and inappropriate

ate for the selection of scientific and technical staff'. He however notes, with what I must assume as a tinge of regret: 'The opportunity of framing an administrative structure and rules and procedures appropriate for a scientific organization, which this set up was intended to confer on the Council of Scientific and Industrial Research has, however, been lost to a large extent by the omnibus adoption of Government rules and regulations'. Four decades later there are many institutions set up as 'societies' apparently autonomous, which are completely in the grip of procedures intended for institutions with completely different purposes. Today, recruitments, assessments, promotions and even appointments of heads of organizations are entangled in a maze of centralised procedures, a situation that Bhabha seems to have sensed even in the 1960s. Even then he appeared critical of the practice of filling national laboratories by drawing away senior faculty of university departments. Bhabha appears caustic when he says: 'The standard method of planning laboratories and filling posts is often forced on many by the administrative and financial requirements of the Government'. He quotes P. M. S. Blackett: 'We must endow ability whenever it is found, and we must guard against subsidising mediocrity'. To every observer of scientific institutions it must be apparent that this sound piece of advice has been rarely heeded. Bhabha noted: '... it is in Government's interest to study and devise *de novo* the best administrative and financial procedures for scientific institutions and for getting the maximum return on the money spent. To apply existing administrative and financial procedures, devised for an entirely different purpose, to scientific institutions is largely to defeat the purpose which the Government has in view by letting the tail wag the dog'. Over the decades since Bhabha raised these concerns, procedures at scientific institutions have remained frozen in time, limiting the ability of organizations to respond to changing environments. The apparent success of the Atomic Energy Commission, and later the Space Commission, in maintaining a substantial degree of administrative and financial autonomy has led to the formation of other Commissions, in the optimistic hope that this device will lead to administrative efficiency. But, by and large, academic and research institutions in India struggle to cope with the growing pace of scientific and technological change, burdened as they are with cumbersome procedures. There is a growing appreciation of the need for academic institution to build up a corpus of funds that can be quickly deployed for development. Unfortunately, government often adopts an ambivalent and unpredictable

attitude towards these resources. Financial rules are usually designed in a manner that legitimizes inefficiency and delays execution of projects. Decision making is invariably a slow and deliberate process, in which files move at a glacial pace up and down a rigidly hierarchical organizational set-up. The interface between the agencies which disburse funds and the institutions that receive them is usually limited. The processes of raising money and spending it are very slow in government institutions. This administrative ambience does little to facilitate competitive research.

Bhabha, in the concluding section of his address, reflected on the role of administration in science. He was forthright: 'It is thought by many that we are reasonably advanced in administration but backward in science and technology. This statement is misleading. We have fortunately inherited extremely competent administrative services capable of dealing with all the types of administration... in what was intended to be a static and underdeveloped economy. ... The type of administration required for the growth of science and technology is quite different from the type of administration required for the operation of industrial enterprises, and both of these are again quite different from the type of administration required for such matters as the preservation of law and order, administration of justice, finance and so on. It is my personal view... that the general absence of the proper administrative set-up for science is a bigger obstacle to the rapid growth of science and technology than the paucity of scientists and technologists, because a majority of the scientists and technologists we have are made less effective through the lack of the right type of administrative support.' Reading Bhabha's last speech, so many years later, I cannot help noting that little has changed in the administration of science. Indeed, in places it has changed for the worse. Even as we plan for a major expansion of the system for higher education and research in science and technology, we might do well to revisit the issues raised so eloquently by Homi Bhabha. Was Bhabha successful in his time in building scientific institutions that provided an exciting ambience for the pursuit of science? The answer is given emphatically in the Acknowledgements section of G. Venkataraman's book *Bhabha and his Magnificent Obsessions* (Universities Press, 1994). Here the author notes that his book 'is about a man who directly enabled me (and hundreds like me) to pursue a satisfying scientific career in this country'.

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