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TATA INSTITUTE OF FUNDAMENTAL RESEARCH

Prelude to the Film on Dr Homi Bhabha

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ICTS-TIFR

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The Film

Homi Jehangir Bhabha, who made visionary and historic contribution to institution and nation building, is one of the leading figures of science in India. On the occasion of his birth centenary in 2009 the Tata Institute of Fundamental Research (TIFR) made a film on his life and achievements. The film traces his early life in Bombay, his student days in Cambridge, his scientific work, his return to India leading up to the establishment of TIFR and the atomic energy

establishment (now named after him). The narrative is mainly told by people who knew Bhabha well including M.G.K Menon, B.V. Sreekantan, Govind Swarup, Obaid Siddiqui and others.

This talk is a brief prelude to the film. We will highlight some aspects of Bhabha as a scientist and an institution builder especially some of his views on science, scientific excellence and the administration of scientific institutions, which are of great value even today.

Bhabha's view on the social function of science

Bhabha's ideal of science was profoundly intertwined with the ideal of a better world based on his conviction that science is an enabler of social transformation. He knew that science had the potential to transform lives.

“The pursuit of science and its practical application are no longer subsidiary social activities today. Science forms the basis of our whole social structure without which life as we know it would be inconceivable. As Marx said, “Man's power over nature lies at the root of history”...Science has at last opened up the possibility of freedom for all from long hours of manual drudgery and today we stand at the beginning of an age in which every person will have the fullest opportunity to develop himself spiritually to his fullest stature.”

A thoughtful and deeply humane vision.

Speech at the inauguration of TIFR on 1st June 1945.

The value of pure research

“Today we all know of the great importance of fundamental research and... how entirely new avenues can be opened up by fundamental research, namely the study of nature for itself unhampered by any preconceived practical ends... The progress of science has also been of great philosophical importance in widening our mental horizon and showing the limitations of commonsense ideas based upon the world immediately perceived by our senses.” –Bhabha

e.g. Quantum Mechanics, Computing (early 20th century)
→ all electronic devices, lasers, WWW and in turn also led to new eyes on the universe, discovery of elementary particles, gravitational waves etc.



L to R: Albert Einstein, Hideki Yukawa, John Wheeler, and Homi Bhabha at the lawns of IAS, Princeton

Discover in India, Make in India?

Bhabha on Science Policy

“The key to national prosperity, apart from the spirit of the people, lies in the modern age, in the effective combination of three factors, technology, raw materials and capital, of which the first is perhaps the most important, since the creation and adoption of new scientific techniques can, in fact, make up for a deficiency in natural resources, and reduce the demands on capital. **But technology can only grow out of the study of science and its applications.**”

-Opening statement of the GOI’s Scientific Policy Resolution, 1958, of which he was one of the principal architects.

Bhabha’s approach to science policy in the words of M.G.K. Menon :

“His aim was not to bulldoze and plant science and technology as a shining imported item and to create a uniform faceless society- but to grow science indigenously, as a way of life in the midst of all that was good and great from the past, a science which would bear the imprint of the traditions, the culture and natural gifts of the Indian people.”

Government support vs Government control

In the letter to the Dorabji Tata Trust, proposing the founding of TIFR, he found it necessary to emphasize:

“Financial support from Government need not, however, entail Government Control” and quoted Prof. A.V. Hill for the British practice, where, “a buffer of some kind is interposed to prevent Government support from becoming Government control”

Bhabha on Science Administration

Oct 1963 issue of International Science and Technology

- Q: What is your most serious problem?
- A: “An answer which may surprise most people – the right administrative set-up. Our administration is not adapted to the requirements of the technical age.”
- “We have inherited administrative services capable of dealing with all the types of administration which had to be dealt with before independence in **what was intended to be a static and underdeveloped country**. Consequently experience of the type of administration needed for industry and for science and technology has been lacking”
- “To apply existing administrative and financial procedures, devised for an entirely different purpose, to scientific institutions, is largely to defeat the purpose the government has in view, by letting the tail wag the dog.”

Bhabha on Science Administration...

- “It is my personal view, which is shared by many eminent foreign scientists, 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.”
- “The administration of scientific research and development is an even more subtle matter than the administration of industrial enterprises, and I am convinced that it cannot be done on the basis of borrowed knowledge. **It must necessarily be done as in the technologically advanced countries, by the scientists and technologists themselves**”
- **He emphasized that it was 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.”

Science Administration...today

Science administration is not a trivial subsidiary activity and its devising also needs a scientific approach and the use of modern technology. Good administration should be a facilitator of growth rather than a hindrance.

e.g. Administrative and financial norms for basic sciences institutions cannot be the same as for other national missions like power, mines, space etc.

Taking cognizance of these differences the Govt should bring out a white paper on science administration and funding, and ensure its implementation. This will be an important enabler for the productivity of Indian scientists, who create an asset called 'knowledge'.

Tata Institute of Fundamental Research

"It is the duty of people like us to stay in our own country and build up outstanding schools of research such as some other countries are fortunate to possess." This was the vision that guided the Tata Institute of Fundamental Research which Homi Bhabha founded. The Institute was founded on 1st June 1945 with support from the Sir Dorabji Tata Trust." - Bhabha

TIFR carries out basic research in physics, chemistry, biology, mathematics, computer science and science education. Research at TIFR is distributed across three schools, working over the mathematical sciences, natural sciences, technology and computer science.

TIFR is a nationally distributed institution of excellence located across the country:

TIFR, Colaba, Mumbai (1945), the cradle that incubated all the Schools and Centers

Homi Bhabha Centre for Science Education (HBCSE), Mumbai (1974)

TIFR Centre for Applicable Mathematics (CAM), Bangalore (1974)

National Centre for Radio Astrophysics (NCRA), Pune (1987)

National Centre for Biological Sciences (NCBS), Bangalore (1992)

International Centre for Theoretical Sciences (ICTS), Bangalore (2007)

TIFR Centre for Interdisciplinary Sciences (TCIS), as part of TIFR Hyderabad (2010)

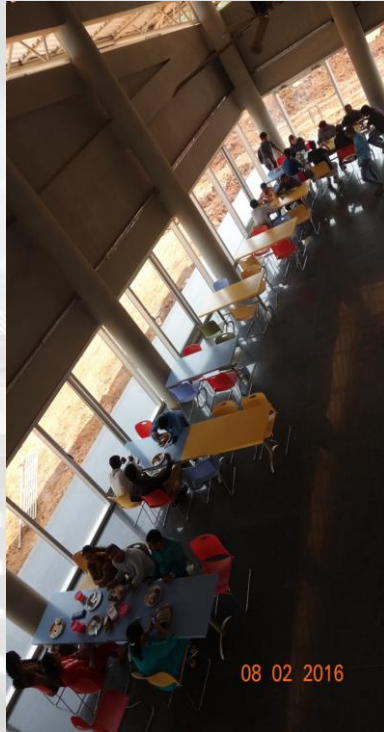
About ICTS-TIFR...



International Centre for Theoretical Sciences-Tata Institute of Fundamental Research, Bangalore

- ❖ Established in 2007, ICTS is an exciting new adventure in Indian science. It aims to catalyze a transformation in research and education in the basic sciences and mathematics.
- ❖ ICTS combines high-quality visitor driven international programs of varying duration with top-notch in-house research in various areas of the theoretical sciences and mathematics, with the aim of creating an interactive and participatory environment of research in the basic sciences.
- ❖ The programs have both educational and research components and contain embedded conferences and there are also short focused discussion meetings and workshops.





“It seemed to me that he was always in a state of hurry, and I’d like to call this a kind of creative or purposeful impatience, that was also singular in him. I would consider Bhabha’s creative energies to be that of this active dreamer that he dreamed big and he wanted to get there very quickly.”

Quote from the film –
Shobo Bhattacharya (Former Director, TIFR)

