

## Homi J. Bhabha: the man who visualised India's nuclear capacity

He laid the foundation of India's huge atomic energy establishment almost singlehandedly, nurturing and expanding it with his dynamic vision. Thanks in no small measure to Homi J. Bhabha's dream, India's atomic energy programme has acquired global stature today, capable of designing and testing nuclear weapons and aspiring to meet its growing demands for nuclear energy.

Friday will mark the birth centenary of the physicist.

Born to Jehangir Hormusji Bhabha and Meherbai on Oct 30, 1909, in Bombay (now Mumbai), the young Bhabha led a sheltered and emotionally secure childhood. The very first glimmerings of a keen and inquisitive mind became apparent when a specialist told his very worried parents why he slept little -- a hyperactive brain that kept him awake at nights.

Exposure to music, books and cultural influences made him a well-rounded personality. Momentous events shaped his formative years.

Excellent family ties with the Tatas and their association with national leaders such as Mahatma Gandhi, Vallabhbhai Patel and Jawaharlal Nehru and also with the British imbued the sensitive boy with a sense of nationalism and perspective.

In 1924, Homi Bhabha passed the Senior Cambridge exam at the age of 15. But by then he had grasped the complexities of Einstein's Theory of Relativity as well as the intricacies of classical painting.

His arrival in Cambridge, a fount of nuclear physics, three years later in 1927, permitted his native genius to bloom for the next 12 years, where he obtained his PhD in physics with specialisation in cosmic rays, in 1934. He was just 25 then.

Bhabha met many of the greatest physicists of the time, namely Niels Bohr, James Franck, and Enrico Fermi, who played key roles in the Anglo-American atomic weapon programmes.

The budding physicist also befriended W.B. Lewis at Cambridge, who as chairman of the Canadian energy programme later, became instrumental in the programme to build Cirus, the heavy water reactor for India.

During a short vacation to India in 1940, Bhabha decided to stay back, as World War II had already broken out. He joined the Indian Institute of Science, Bangalore, as a reader in theoretical physics, under Nobel laureate Sir C.V. Raman. Vikram Sarabhai also served there for a short stint.

In March 1944, even before the world acquired a nodding acquaintance with the mighty potential of nuclear energy, Bhabha, then a professor, wrote to Sir Dorab J. Tata, who headed the Tata Trust, proposing an institute for nuclear physics in India.

'When nuclear energy has been successfully applied to power production in, say, a couple of decades from now,' Bhabha wrote with remarkable prescience, 'India will not have to look abroad for its experts but will find them ready at hand.'

Thus the Tata Institute of Fundamental Research (TIFR) came into being on Dec 19, 1945, just four months after Hiroshima and three years before Indian independence.

Bhabha served as its first director, which placed him at the commanding heights of the country's nuclear future, until his premature death in a plane crash in the Swiss Alps on Jan 24, 1966.

Bhabha was very particular about maintaining excellence. Addressing the then National Institute of Sciences, Bhabha said: 'This is a field in which a large number of mediocre or second rate workers cannot make up for a few outstanding ones, and the few outstanding ones always take at least 10-15 years to grow.'

As the new nation's prime minister, Nehru entrusted Bhabha with complete authority over all nuclear-related affairs and programmes. Both of them shared a close rapport. In April 1948 at Bhabha's bidding, Nehru agreed to legislate the Atomic Energy Act in the Constituent Assembly, creating the Indian Atomic Energy Commission (IAEC).

On Jan 3, 1954, the IAEC decided to set up a new facility, the Atomic Energy Establishment, Trombay (AEET). In August the same year, the Department of Atomic Energy (DAE) came into being with Bhabha as its secretary. Till date, it remains answerable only to the prime minister. Prime minister Indira Gandhi renamed AEET the Bhabha Atomic Research Centre (BARC).

Bhabha visualised building an Indian nuclear weapons capability, according to Raja Ramanna, cited by Raj Chengappa in his book 'Weapons of Peace: The Secret Story of India's Quest to be a Nuclear Power'. Bhabha told Ramanna that 'We must have the capability. We should first prove ourselves and then talk of (Mahatma) Gandhi, non-violence and a world without nuclear weapons.'

Bhabha recruited and supported many of the principal players in India's successful efforts to develop and test nuclear weapons. Homi Sethna, P.K. Iyengar, Vasudev Iyer, and Raja Ramanna -- all were appointed by Bhabha in 1949.

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