

The following article is a reproduction of an article published in-"Science Reporter"(February 2000) published by National Institute of Science Communication (NISCOM)

J.C. BOSE: The Inventor Who Wouldn't Patent
Prof Rajesh Kochhar

A 100 years after Jagdish Chander Bose, India seems to have come to the painful realization that it is unlikely to make any worthwhile scientific inventions any more. It has therefore decided to invent a J.C. Bose that did not exist before. This Bose cannot be patented internationally but can certainly be put to good use in the domestic and NRI market.

Bose is one of the founding fathers of radio-physics, whose research acted as a bridge between the original discovery by Heinrich Rudolf Hertz and practical use by Guglielmo Marconi.

Marconi shared the 1909 physics Nobel prize. Had Hertz been alive (he died in 1894), then he would probably have been similarly honoured. **Did Marconi cheat Bose?** A story in **The Telegraph** (December 1997) carried the rather sensational title "**Bose invented Marconi's wireless**". The story was based on a recent report by some US-based Indian engineers that the detecting device (or coherer as it was then called) that Marconi used, the so-called Italian navy coherer, was modified from an instrument invented by Bose two years previously.

The story asserted rather ingeniously that "so far, his (Bose's) reputation has rested on his botanical work." It quoted a scientist associated with the project as saying, "A combination of factors like naivete about patenting, plain misfortune and politics of the contemporary times weighed against Bose."

This assessment is unhistorical and an exercise in time-warp. It presents Bose as a victim of circumstances and conspiracies which he was not. It seeks to assign to Bose and his associates motivations and aspirations that did not exist then, but are an after thought. It attempts to evaluate Bose in a time-frame that came into being later and which Bose could not have anticipated.

It is on record that Europe's encouragement to, support for and recognition of Bose's pioneering research were unstinted and spontaneous. He was offered a professorship at Cambridge University. **He was the first professionally trained mainstream Indian scientist to be elected a fellow of the prestigious Royal Society of London. He was fully aware of the commercial implication of his radio work and conscientiously wanted no part of it. As for Marconi, he was literally on a different wavelength.** From 1894 till about 1900, Bose studied the optical properties of radio waves. Value of his work lies in his experimental innovations. He modified old detectors and made new ones. In addition, he tested a wide variety of materials for the purpose because metals would get easily oxidized "in the warm and damp climate of Bengal". **As early as 1895, Bose demonstrated to an excited Calcutta audience the wireless Transmission of radio waves over a distance of 75 feet (25 m) through masonry. Bose's waves were microwaves with Lengths in the millimetre range.** For travel through long distances in space one needs longer radio waves. Their study was initiated by **A.S. Popoff in Russia and profitably taken up by Marconi. For his detectors, he**

like every body else, made use of Bose's researches which were already published and therefore common property. It would be unfair to grudge Marconi his practical and commercial success. After all, both he and Bose achieved what they aspired for. Bose presented his first results before the Asiatic Society, Calcutta, in May 1895. According to the pioneering Indian chemist, Prafulla Chandra Ray, who was colleague and close friend of Bose, "It appears that he had not then realised the importance of the new line of research he had hit upon."

Bose sent copies of his research paper to his former teacher Lord Rayleigh and to Lord Kelvin, both of whom immediately saw its worth. Bose went on a lecturing tour of England and Europe during 1896-1897 and then again during 1900-1902 when he visited the US also. After his public lecture in 1897 at the Royal Institution in London, he expressed **"surprise that no secret was at any time made as to its (coherer's) construction, so that it has been open to all the world to adopt it for practical and possibly money-making purposes"**. An early admirer of the Bose coherer was the British navy, which used it to establish effective radio link between a torpedo boat and friendly ships. In May 1901 he wrote to his friend Rabindranath Tagore: "...the proprietor of a reputed telegraph company...came himself with a Patent form in hand...He proposed to take half of the profit and finance the business in the bargain. This multi-millionaire came to me abegging. My friend, I wish you could see that terrible attachment for gain in this country, that all engaging lucre, that lust for money and more money. Once caught in that trap there would have been no way out for me."

Exasperated by Bose's "quixotic" approach towards money, two of his lady friends, British-born Margaret Noble (better known as Sister Nivedita) and American-born Mrs Sara Bull on their own initiative obtained in 1904 an American patent in Bose's name (for his "galena single contact-point receiver"). Bose, however, remained unmoved and refused to encash the patent. The irony of the situation seems to have gone unnoticed. Here in Nivedita we have a spiritualist advocating the cause of patents and royalties and a physics professor dismissing the idea. The reason must be sought in their backgrounds: Nivedita was a product of industrial Europe while Bose was a child of the orientalisised East. There can be no doubt, as P.C. Ray reminded the audience assembled in 1916 to greet Bose on his knighthood, that **"If he had taken out patents for the apparatus and instruments which he had invented, he could have made millions by their sale"**. More importantly, he would perhaps have become an Indian role-model for production of wealth through science. As it is, Bose abandoned radio waves altogether, there were no trained students to continue the research; and India's tryst with technical physics came to a premature end.

Bose's anti-patent position is explained in his authorised 1920 biography written by his close friend **Patrick Geddes**, "Simply stated, it is the position of the old **rishis** of India, of whom he is increasingly recognised by his countrymen as a renewed type, and whose best teaching was ever open to all willing to accept it." Bose carried on his shoulders the full weight of his country's defensiveness. He was the proof, because proof was needed, that Indians could do modern science. As Tagore wrote to him, Bose was God's instrument in the removal of India's shame. Bose did not want to make hay for himself in the European sunshine.

It is not often realised that the European recognition won by J.C. Bose and P.C. Ray on the scientific front was the first tangible proof that Indians could be equal to, and

command respect from, the Europeans. It thus had a political dimension. Bose illustrates Henry David Thoreau's aphorism: "A man is wise with the wisdom of his time only, and ignorant with its ignorance", with the added proviso that the same calendaric time can denote different cultural times. **For Europe (modern) science was the key to prosperity. To India, science was the cause of its misery and humiliation. Industrialisation artisanised the European society. In contrast, in India, since the new middle class was derived from upper castes, science itself was Brahmanised.**

Insistence on the addition of Bose's name as a foot-note in Marconi's biography will be an exercise in historical nitpicking. There may be some solace in the invention of an unhistorical J.C. Bose who would mirror our current economic and technological frustrations. But what is needed is the positioning of J.C. Bose in a temporal context and the discovery of a new J.C. Bose who would be active and relevant in the present context.

Prof Rajesh Kochhar is Director, National Institute of Science, Technology & Development Studies (NISTADS) and Director-in-Charge, National Institute of Science Communication (NISCOM).

Originally published in The Economic Times (18 March 1998) under the title- "Time warp as an escape from the future"