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Jagadish Chandra Bose: Extraordinary man of science

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Why in News: Late last month, a group of researchers from Tel Aviv University in Israel reported that they had been able to pick up distress noises made by plants. The discovery that plants 'cry' in distress, therefore, did not come as much of a surprise to them. It seemed just a logical extension of J C Bose's work.

A brief about J.C.Bose

Born in Mymensingh, now in Bangladesh on November 30, 1858 to Bhagawan Chandra Bose, an assistant commissioner in the government and member of the Brahmo Samaj.

Raised in accordance with Indian traditions, his father wanted him to learn Bengali before he learnt English.

He attended a vernacular school, where his classmates belonged to diverse communities and religions. He enrolled at St Xavier's School in Calcutta where Jesuit priest Father Eugene Lafont helped him develop interest in natural sciences. He graduated in physics from Calcutta University.

In 1887, he married Abala, the daughter of Brahmo Samaj reformer Durga Mohan Das

Bose wanted to take the Civil Services examination in England but changed his mind and pursued natural science at Cambridge. There, he was taught by noted teachers Francis Darwin, James Dewar and Michael Foster.

During his stay in England, he also befriended Prafulla Chandra Ray, who later attained fame as a chemist. After graduating in science, he returned to India and was appointed professor of physical science at Presidency College, Calcutta.

He faced racism in his job, with his salary being much lower than that of British counterparts. Bose registered his protest by teaching without taking any salary for three years.

Later, the college made his appointment permanent and paid his salary arrears. In 1917, he set up the Bose Institute in Calcutta where scientists conducted research on plants.

Bose might not be a very familiar name to the current generation, but he is a colossal figure of Indian science. A physicist-turned-biologist, Bose, who lived between 1858 and 1937, made pioneering contributions in both the fields and was the first Indian to have made a powerful impact on modern science, much before Srinivasa Ramanujan, C V Raman, or Satyendra Nath Bose, a student of Jagadish, arrived on the scene.

Plant cry- Famous Experiments of Bose

A famous experiment conducted by Bose at the Royal Society of London in 1901 demonstrated that just like humans, plants too have feelings. He placed a plant in a vessel containing bromide solution, which is poisonous.

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Using his instrument, he showed on a screen how the plant responded to the poison. One could see rapid to and fro movement on the screen which finally died down.

A similar thing would have happened if an animal was placed in the poison. The plant died due to the poison. He called his instrument crescograph and conducted further experiments.

Most scientists across the world praised his findings. He is known for two books: *Response in the Living and Non-living* and *The Nervous Mechanism of Plants*. He also conducted research on radio waves.

Other findings

Jagadish Chandra Bose is remembered for two things — his work on wireless transmission of signals, and on the physiology of plants. He is also credited as one of the first contributors to solid state physics.

Bose is widely believed to be the first one to generate electromagnetic signals in the microwave range. In 1895, just a year after he began his active research, he demonstrated, before an audience in Kolkata, how microwaves could be used, wirelessly, to ring an electric bell on the other side of a building.

He improved an instrument called the Coherer that was used to detect radio waves. In 1896, he met Guglielmo Marconi who was also conducting research on radio waves. Bose was the first one to come up with radio receivers, which enabled wireless telegraphy.

In 1895, he presented a research paper titled *On the Polarisation of Electric Rays by Double Reflecting Crystals* that was published by The Royal Society of London during 1896. Drawing on his experiences and imagination, he wrote a science fiction titled *Niruddeshar Kahini* that was later on translated into English.

HONOURS AND DEATH

In recognition of his contributions to science, the British government made Bose a Companion of the Order of the Indian Empire in 1903 and Companion of the Order of the Star of India in 1912.

He was knighted in 1917 and was elected a Fellow of the Royal Society in 1920. The Acharya Jagadish Chandra Bose Indian Botanic Garden was named after him. He died in Giridih, now in Jharkhand, on November 23, 1937.

Conclusion

In a way, Bose was possibly the world's first biophysicist. J C Bose could — many believe he deservedly should — very well have been India's first Nobel Prize winner, ahead of his life-long friend and confidant Rabindranath Tagore, with whom he used to have a prolific, and often poetic, correspondence.