

Biology and chemistry

The editorial 'Biology and Chemistry: Life and Death'¹ explores extinction of dinosaurs from biological, chemical and to a certain extent, extraterrestrial (asteroid impact) perspective. However, the editorial should have taken into account the terrestrial-physical factors contribution towards the extinction of dinosaurs in particular, and the fifth mass extinction, in general.

Geography of the earth has been constantly changing. This is in part, a consequence of cumulative effects of the supercontinent break-up, movement of tectonic plates and earthquakes. All of these contribute greatly to altered ecosystems and geomagnetism as well. Furthermore, any change in these two additional factors drastically affects the lifeforms that constitute the ecosystems

involved. In this direction, perhaps geomagnetic pole reversals greatly affect the lifeforms during such alterations of the geography of the earth. Additionally, visualization of the consequences in such scenarios is beyond the realm of anybody's imagination.

Continuing the discussion on similar lines, I would like to draw the attention of the readers to one such pole reversal documented to have occurred 65 million years ago coinciding with the extinction of dinosaurs². In fact, a number of documented pole reversals also coincide with various mass extinctions, tempting me to hypothesize that geomagnetic pole reversals are a major contributory factor for extinction of life. Needless-to-say, 'life' seems to thrive on this planet despite such decelerating factors, but extinctions

led to evolution of different forms of life. Nevertheless, at least on paper, one of the geomagnetic pole reversals coincides with the extinction of dinosaurs.

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Kartick Chandra Bose

Jain and Murthy¹ have highlighted the contributions made by K. C. Bose. In this context, I would like to provide some additional information on him.

Kartick Chandra Bose was born on 16 November 1873. His parents were Prasanna Kumar Bose and Raj Lakshmi Bose. He passed his MB examinations from Calcutta University, obtaining several gold medals and special prizes in various sub-disciplines of medicine and surgery. He topped his class throughout the MB course. Bose was a very eminent doctor, medical scholar and industrialist. He was called the 'Father of Chemical Industry in India' at his centenary celebrations at Calcutta University in 1973.

Bose was a pioneer in many ways. He was the co-founder and first Managing Director (1899–1908) of the Bengal Chemical and Pharmaceutical Works. Later, he founded his own pharmaceutical company, Dr Bose's Laboratory, in 1908. In 1909, the first machine-made tablets were made in India by Bose. His laboratory was the only firm in India to manufacture rectified spirit solely for the pharmaceutical industry. He was also the first clinician in India to start clinical and X-ray laboratories. More than 30 drugs and formulations were produced by Dr Bose's Laboratory.

Bose's lifelong research on indigenous drugs were pathbreaking. He published numerous research papers in peer-reviewed journals like *The Journal of Ayurveda*^{2,3} and *Indian Medical Record* (1931). Although Bose made immense contributions towards manufacturing of various drugs, he is best remembered for his seminal research on *Rauwolfia serpentina*, which is also known by the common Indian name, Sarpagandha. *Rauwolfia* is native to India and Bose along with the famous Ayurvedic physician Gananath Sen published a seminal paper in 1931 on the use of an alkaloid extract (serpentine) from *Rauwolfia* in the treatment of hypertension and 'insanity with violent maniacal symptoms'. This was a landmark finding which paved way for later research on hypertensive drugs in India and abroad. Their work has been cited in several prestigious publications^{4,5}.

Bose was a great philanthropist who contributed to various charitable causes. He edited and published popular health magazines in various languages including English (*Health and Happiness*), Bengali (*Swastha Samachar*) and Hindi (*Tandoorusti*). Bose died on 25 August 1955.

It can be stated that Bose was a versatile genius who made significant and

pioneering contributions to several facets of human life. Although he is probably best remembered for his world renowned pioneering research on *R. serpentina*, we should not forget his significant contributions in other areas like the development of chemical and pharmaceutical industries, pioneering medical and therapeutic research as well as numerous philanthropic endeavours. He can be considered as an important figure of the Bengal Renaissance.

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5. Gupta, S. P. K., *J. Indian Acad. Clinic. Med.*, 2002, **3**, 100–104.

Acknowledgement. I thank Indrani Bose, Bose Institute, Kolkata for providing useful information.

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