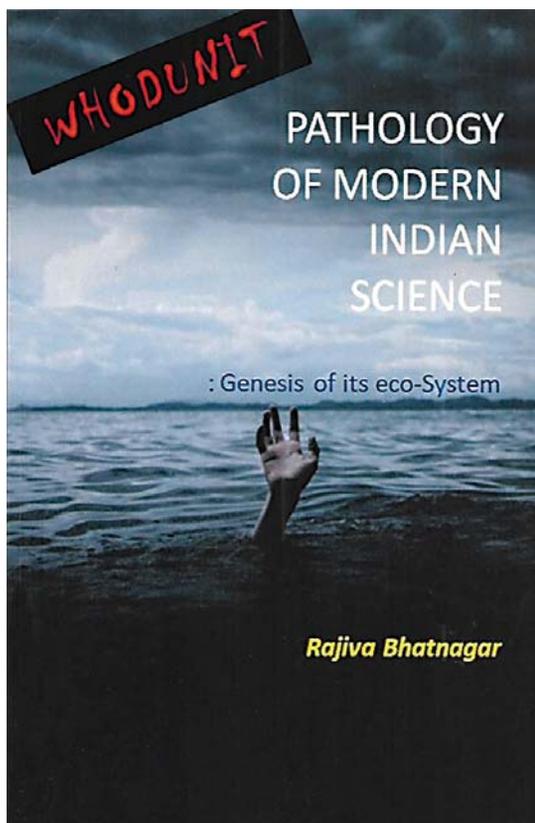


Book Review



Pathology of Modern Indian Science: Genesis of its eco-System by Rajiva Bhatnagar, Publisher: Kindle-Direct Publishing; Pages xiv+ 218 pages; ISBN 9781674285238; Price: \$9.09

According to Oxford English dictionary, pathology is the science of bodily diseases or the symptoms of a disease. When searched in Google, we get a little elaboration as the following ‘pathology is the science of the causes and effects of disease’. The title of the book *Pathology of Modern Science in India* by Rajiva Bhatnagar is very aptly carved as it analyses the causes of failure in maintaining the healthy (glorious) state of science and technology in post-independent India. The author offers in this book a compelling, evidence-based analysis to establish the causes that impeded the growth and prominence of science in post-independent India. According to the author, it is the genesis of the present ecosystem prevailing in

science and technology in India. According to Huxley “same cause produces the same effect”. Unless the known cause can be sanitized, the disease will repeat and will become chronic in nature.

The book is divided into four parts and contains eleven chapters in total. The first two chapters describe how modern science education was revived by the entry of western explorers in the sixteenth century, subsequently dominated by the East India Company and finally under the British Crown after 1857 till independence. Science started growing in India (measured by the number of publications) from the beginning of twentieth century and grew rapidly thereafter. According to the author, this “coefficient of growth” was impeded in post-independent India due to various reasons such as personal rivalry between prominent scientists, regionalism, bigotry, social construct, culture of unquestionable reverence for teachers and authorities which established an ecosystem that was non-conductive to the expected growth in this period.

Personal acrimony between Meghnad Saha and C.V. Raman is well known. The continued non-cooperation and resistance to Saha’s endeavor to conduct good research is elaborated in the book. Personal rivalry between these two scientists was not limited only to themselves but turned into a divide between Bengali and south Indian scientists. Saha paid back Raman by the same coin by being instrumental in forcing Raman to resign from the directorship of Indian Association for the Cultivation of Science (IACS) and also for his removal from the directorship of the Indian Institute of Science, Bangalore later. The damage that the nation suffered was not only loss in science output but also an undesired groupism among scientists. This rift resulted in the formation of three science academies in India with similar objectives in lieu of a single academy with all scientists of the nation under one umbrella, like the Royal Society of London. How Raman dumped his student K.S. Krishnan who was the main person working with Raman and provided appropriate explanation of the so called ‘Raman effect’ is well known. This made Krishnan leave this area of research permanently and shift to other areas without ever expressing any grudge against his ‘guru’ till his death.

The social, cultural, regional, family background, proximity to prominent scientists and power very often shaped the destiny of scientists in India. Four important scientists who were at the forefront of development of Indian science after independence were C.V. Raman, Meghnad Saha, S.S. Bhatnagar and H.J. Bhabha. They belonged to different strata of the society. Of them Meghnad Saha and H.J. Bhabha were at the two extreme ends: Saha came from a poor family whose father ran a grocery shop for living, while Bhabha was born in a rich Parsi family steeped in western culture. This cultural similarity with Jawaharlal Nehru, the first Prime Minister of India, helped Bhabha to seize opportunities easily. The rule of thumb says that to attain power and prestige one has to stay on the right side of power. Social and cultural closeness to the powers is an added advantage. Any criticism of the men in power can result in disaster. Saha, and to a certain extent Raman, were critical about many of the government policies. Raman remained unscathed because he was the only Nobel Laureate in science in India. But Saha had to pay the price heavily. Saha was the first person who had introduced nuclear physics studies in India and was a staunch supporter of nuclear research and nuclear energy programme in India after the discovery of fission. The reason why the centre of nuclear research shifted to Bombay from Calcutta is well known. It is not surprising that Saha was not considered for any national award by Jawaharlal Nehru in spite of his impeccable scientific merit which earned him the FRS when he was quite young. All these resulted in establishing an ecosystem for future generations of scientists on how to garner recognition.

Having worked for 37 years in the Department of Atomic Energy (DAE), the largest organisation in the country with 60,000 personnel, the author is in a position to delve into the structure and internal intricacies of the working environment of the atomic energy establishment. The centre of gravity of science research shifted from universities to research institutes during Bhabha's time and with this shifted the intimate student-teacher relationship of universities to corporate like norms and ethos. The book has documented the unkind behavior of Bhabha towards his colleagues whenever somebody criticized or crossed the path of Bhabha. It is true that Bhabha was very effective in attracting and inviting talent to his institution like D.S.

Kosumbi, P.S. Gill, E.C.G. Sudarshan and such others. However, it is the same person who sacked or forced them to leave whenever he felt threatened in his position of prominence. According to the author a different kind of culture and ethos slowly grasped the institute and silently changed the ecosystem of research in DAE institutes.

A personal view of mine is that the book is a bit biased, presenting only a one sided (negative) view. Portraying Bhabha as a 'bad guy' may not be fair on him. No one is perfect, nor were these scientists. It is no denying that Bhabha was a visionary and his contribution towards building the atomic energy programme in India was undoubtedly marvelous, in spite of his other deficiencies. In a recent book *Homi Bhabha: A Visionary & Science Administrator Extraordinaire* published in 2019 by Narendra Dutt Sharma and Baldev Raj who worked for more than four decades in DAE establishments demonstrated, for example, his superb administrative acumen through documentary evidence. A review of the book has been published in the July-August 2020 issue of *Science and Culture*.

The remark about Tata's philanthropic activities being inspired by personal agenda and self-interest is unkind. Tatas were probably the first industrialists who realized CSR (Corporate Social Responsibility) much before it was overtly conceptualized and they have been voluntarily contributing for the benefit of science, education and industry in India since pre-independence. What is the harm if the benefit accrued overrides the publicity angle?

Unlike a true pathologist whose job is to focus on the defect or abnormality in a specimen and look for a disease, Rajiva Bhatnagar offers a sort of prescription in the last chapter of the book 'Is there a way?' to rectify this trend. The book also provides a brief disposition of the history of development and progress of science in India.

The book offers a comprehensive account of the genesis of ecosystem of India's science practice and is a must-read for people who want to learn about science in India and its ecosystem. I congratulate Rajiva Bhatnagar for sharing real world stories with ample documents which has made the book more interesting and convincing. □

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