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Probing India's Failure to Produce Nobel Laureates in Science after CV Raman

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Abstract

India's track record is very poor, if we consider the number of Nobel Laureates produced by India since the inception of Nobel Prizes in 1901. Rabindra Nath Tagore was the first Indian recipient to receive this coveted Prize in 1913 in Literature. CV Raman was the second Indian to be awarded this prize in 1930 for his world famous discovery known as 'Raman Effect'. After these two, some Indians have been awarded Nobel Prizes in Science, Literature, Economics and for promoting Peace, but most of these Indians were awarded for their work done in other countries, except for two Peace Prizes. It clearly shows that Indians have potential to win Nobel Prizes, but there is something wrong in the Indian ethos that we fail to produce Nobel Laureates on Indian soil. The reasons of our failure are analysed in this article with special reference to CV Raman, our first and last Nobel Laureate in Science during the last 86 years.

Keywords: *Indian Nobel Laureates, CV Raman, IACS Calcutta, Golden Era, Biography, Scientific Policy Resolution (SPR), DST INSPIRE*

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INTRODUCTION

The era of 1930s is known as 'Golden Era of Indian Science'. Indian scientists like JC Bose, CV Raman (Figure 1), DS Kothari, SN Bose, MN Saha, DM Bose and many others produced world class research publications comparable with anywhere in the world. After 1947, India launched on its Science and Technology development programme by setting up a chain of National laboratories under the Council of Scientific and Industrial Research (CSIR). Tata Institutes of Science at Bangalore and Bombay, having earned the international reputation in research, were already functional before 1947. An ambitious program to develop nuclear energy, using indigenous nuclear power reactors, was initiated under the supervision of HJ Bhabha as Chairman of Atomic Energy Commission. There was proliferation of universities in India after independence; however, they failed to produce Nobel Laureates. We can only boast for Calcutta University which produced the first and last Nobel Laureate in Physics, CV Raman, during the last 86 years since 1930, the year Raman was awarded the Nobel Prize. Rajinder Singh writes in introduction of Raman's biography [1]: "Within India and abroad, the Indian physicist Chandrasekhar Venkata Raman, remains a legendary Figure in the history of science. At the end of the 1920s he founded the Raman spectroscopy, an analytical tool to determine the molecular structure of substances. He was the first Asian to win the coveted Nobel Prize in the field of physics." He further writes: "Author's aim is to show the achievements of Indian scientists in the field of Modern Western Science, and obviously show that the 'Indian brain' is as good as that of a man/woman from Western culture".

I am somewhat astonished and intrigued by the second statement of author. If 'Indian brain' is as fertile as anywhere in the West, then why India failed to win a 2nd Nobel Prize in Physics (or any other area of Science in India) after CV Raman? We have to look into the reasons, which may be classified as socio-cultural, religious and political.

When the British-Indian Government established three Universities in Calcutta, Bombay and Madras in 1857, it was envisaged that Modern Science will be taught in vernacular languages in Indian Universities.

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But this was opposed by Raja Ram Mohan Roy, the renaissance leader of Bengal on the plea that British do not want to teach European Science to Indians. I think this was a retrograde step which created an Indian elite, well-educated through English medium, and always in support of status quo with the British. Majority of Indian students were left in the lurch due to this policy as they could not afford to compete with the elite group getting education in the English medium. Even after independence, English is ruling the roost and creating a wedge in the Indian society. During 21st century, English has assumed the role of mother tongue for elite Indians. We failed to produce a Second Raman, due to our failure to teach Science in Indian languages, as practiced in all other countries of Europe and Asia, where Science is taught in the mother tongue of students. It is well known that conceptual understanding of a subject is possible only in mother tongue, not in a foreign language. Most of our universities are teaching Science in English medium and students adopt the method of rote learning.

Fig. 1: *C.V. Raman (1888–1970).*

Raman topped in all his university examinations, but not allowed to study abroad due to poor health, but more due to a taboo that Hindus considered it a sin to cross over the sea. Mahendra Lal Sarkar who created Indian Association for Cultivation of Science (IACS) in Calcutta for promotion of Science in India on the pattern of Royal Institute, London was highly critical of orthodox Hinduism [2]: "The Hindu religion, besides having a pre-eminent degree, is the grand characteristic of all religions which is to divorce the mind from the works of God which had through the corruption of successive ages, become a heterogeneous medley of theology, philosophy, science and what not.

In other words, a chaotic mass of crude and undigested and unfounded opinions on all subjects; enunciated and enforced in the most dogmatic way imaginable. A myth had been propagated by orthodox Hindus that all discoveries in Science were already known to Vedic Indians; the West has simply exploited the Indian knowledge of Vedas. What a stupor? It was announced in Indian Parliament by no less a person than our Prime Minister that Genetic Engineering and Surgery had been practiced in India when he referred to Ganesha's story [3], with transplanted head of an elephant. How can Science develop in India when our political leaders take pride in Indian mythology and call it harbinger of Modern Western Science?

Raman was not a University's Professor till 1917 but an employee of Finance Department of British India, who took to research in Science as a passion of his life. IACS Calcutta provided him bare minimum facilities, with hardly any research journals and grants for participation in International Conferences. However, by sheer dedication, Raman succeeded where all Western scientists failed to discover something already predicted theoretically by their own colleagues. Professor Saha wrote about Raman's discovery eulogising his work as follows [4]: "This is rather strange, because European writers are never tired of describing the Indians as given over completely too metaphysical speculations, and possessed of little practical abilities. Here were the roles reversed as an Indian giving the first practical effect to the theoretical speculation of European savants, which they themselves have been unable to verify!"

If we try to investigate the historical development of Science in India after 1947, we notice that Scientific Policy Resolution (SPR) [5] was adopted by Indian Parliament in 1958 for this purpose. The preamble of the

resolution dwells on the values and significance of scientific progress. Its aims were to promote, foster, cultivate and sustain science and scientific research in all its aspects and to secure for the people of the country all the benefits that can accrue from the acquisition and application of scientific knowledge [6]. However, it does not lay stress on developing Universities with regard to the National Research Institutes created under CSIR. Once I asked VS Arunachalam, Chairman Centre for Study of Science, Technology and Policy (CSTEP) about lop-sided development of Science in India. He replied [7]: "India had Scientific Policy Resolution (SPR) which is not the same as Science Policy. Hence, our failure to produce world class Scientists in the University system." One can differ with Arunachalam on connotation of SPR but it is a matter of fact that universities were not provided as liberal a funding as to CSIR Laboratories in India. Indian universities suffered due to poor quality of Infrastructure even for teaching of Science at an appropriate level.

Another valid reason for not producing good quality scientists in India is the Reservation Policy (RP) adopted for recruitment and promotion in the universities and research institutes. When 50% recruitment is not based on merit, how can we expect quality of production in education and research at the same level as in scientifically advanced countries? Reservation in India should be based on economic status of Indian families; not on any other criteria as being practiced now. The Indian constitution framers allowed this privilege of reservation for ten years in the first instance but it has gone on and on by amendments to our constitution ad infinitum due to vote bank politics in India. When I was involved in the conduct of PMT (examination for entry to Medical Colleges in Punjab) during 1980s, I found that students with zero mark were allowed admission if the vacant seats were available under Reservation Quota (RQ) for some privileged class under the Indian Constitution.

Last, but not the least; Indian parents are also responsible for killing the creativity of Indian students at the school level. Almost 80–90% students selected in Medical and Engineering Colleges are those who have not studied in regular schools but in coaching academies being run in every small and big city of India. These academies do not teach prescribed courses but train the students in tackling multiple choice questions being asked in competitive examinations. As a consequence, the creativity takes the back seat and the sole purpose of getting admission by hook or crook gets the upper hand. There are coaching academies in Kota city of Rajasthan catering to hundreds of thousands of students from all over India. I have never seen such a flourishing business in education anywhere in Europe or America. But at what cost, if we failed to produce a Second Raman out of a population reaching the threshold of 1.25 billion Indians!

C.V. Raman published his first research paper [8] "Unsymmetrical diffraction-bands due to a rectangular aperture", while he was a B.Sc. Student in Presidency College, Madras in Philosophical Magazine and started his journey to Nobel Laureate-hood. This achievement by C.V. Raman can inspire many present day students of similar age to be creative and start on a career of research scientist. The biography of Indian Nobel Laureates must be a part of Science curriculum at school level.

Raman reported his discovery which led to Nobel Prize in Physics on 28th February 1928. It is being celebrated as National Science Day in India under the Ministry of Human Resource Development (MHRD) which looks after Higher Education in India. Department of Science and Technology (DST), Govt. of India has started INSPIRE (Innovation in Science Pursuit for Inspired Research) programme to motivate school students to study science as their profession. Those who qualify under this programme are offered fellowship till their completion of higher studies leading to Ph.D. The basic objective of INSPIRE is to communicate to the youth of the country the excitements of creative pursuit of science, attract talent to the study of science at an early age and thus build the required critical human resource pool for strengthening and expanding the Science and Technology system and Research and Development base. Despite these

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bonanzas, very few opt for Science as a career after finishing school education.

Let me finish this essay with some quotable quotes of the first Indian Nobel Laureate in Physics, Sir CV Raman [9]: "Good science was not created merely by spending money, starting laboratories and passing orders. More important was the human element, and if quantity replaces quality then disaster would surely follow". How true Raman's prediction is when we look to proliferation of Private Universities and Colleges in India.

Raman was against all type of Govt. control or interference: "Government control not only inhibits creativity, but more disastrously, it encourages sloth and intrigue, besides rewarding non-performance." Let us not forget what is happening under the present regime; the examples of JNU New Delhi and Central University, Hyderabad are recent examples.

Raman was one of the first to raise his voice against the bureaucratic approach in the post-independence era, but bureaucracy has survived, thrived and grown to even more ominous proportions. And there is no body left now to raise a word of public interest.

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