

# My Forays into History and Philosophy of Science and Other Areas

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## **Abstract**

*This paper is a historical review of author's forays into History and Philosophy of Science, and other areas of his research interests, for example, teaching of Science and its popularization in vernacular medium. Presently, author is concerned about pollution of underground waters in Punjab and a dialogue between Science and religion.*

**Keywords:** History of Science, Philosophy of Science, Ecology, Science education

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My entry into history and philosophy of science was not a pre-planned programme. In High School, I was feeling to be cut out for English literature but my teachers persuaded that I should opt for science when I topped in Government High School Malerkotla in 1957. I still remember the fiery speech of Head Master Khalsa Singh of Khalsa High School, Lasso, to inspire the students to study science and mathematics, and ignore history which is the easiest subject on earth. When I joined Punjabi University, Patiala in 1965, I was fascinated to study of Cosmology to interpret Guru Nanak's thought about creation of the Universe. Hakam Singh, librarian of university library, impressed upon me to study history of science also. It stood in good stead in my teaching career as introduction of subject with its historic origin proved to be always motivating and inspiring for students.

During 1975, Indian National Science Academy (INSA) organised a Summer School in History of Science in New Delhi with a purpose to start courses at B.Sc. (Honours) level in Indian universities. I was a participant and Prof. DS Kothari, ex-Chairman UGC (University Grants Commission), was chairman of the session in which I presented my Paper. After this School, I was nominated as a Member of UGC Panel on History of Science, even when I was a young Lecturer in Punjabi University, Patiala. A project was also sanctioned in 1977 by UGC but the fellow who joined as research scholar left me in the lurch.

During 1980, UNESCO organised an International Programme to celebrate 1,000th birth anniversary of the most influential of Islam's philosopher-scientist Abu Ali al-Husain Ibn Abdallah Ibn Sina, known in Europe as Avicenna. INSA asked me to organise a National Seminar in GNDU Amritsar. I had never read about this Islamic genius. Prof. Gurbax Singh, a historian friend of mine came to my help and I collected all relevant literature on Avicenna. I prepared the key-note address as well my paper "*Ibn Sina's approach to Physics*" which was published in Indian journal History of Science in 1986 [1]. This seminar gave me impetus to start courses in History and Philosophy of Science at M.Phil. level in GNDU during 1985. Prof. Dhruv Raina, now in JNU, was invited to teach this course.

We were not successful with running a teaching programme in History of Science as planned and it had to be discontinued after 5 years. There was no encouragement from the university, and there was hardly any competent teacher to examine our M.Phil. students. However, my foray into this area continued in the form of obituary notes and digging up old records of scientific contributions of Punjabi scientists. I travelled to FRI (Forest Research Institute), Dehradun and collected information about the work of Puran Singh, who was founder of Chemistry of Forest Products in India. Puran Singh served in FRI as Imperial Chemist for ten years (1908–18) and published 53 notes and

papers [6]. My book “Professor Puran Singh: Scientist, Poet and Philosopher” is a tribute to this first Punjabi Scientist who got training in Pharmaceutical Chemistry from Tokyo University during 1900–1903.

The other Punjabi scientists who came under my scanner were Ruchi Ram Sahni, Bawa Kartar Singh, Abdus Salam and Piara Singh Gill. Abdus Salam won the Nobel Prize and I interviewed him in ICTP, Trieste in 1977 before he won the NP. On return, I wrote some articles in vernacular media highlighting his discovery of unification of electromagnetic and weak forces. My article “*Abdus Salam: A grand unifier of men and forces*” was published in a commemorative volume “*Abdus Salam: As We Know Him*” in 1992 [3]. Prof. Salam visited GNDU Amritsar in 1981 and was awarded D.Sc. (Honoris Causa) degree. His convocation address delivered in Punjabi remains a milestone in the history of GNDU Amritsar. I had the privilege to prepare the citation for this degree and to accompany him on his pilgrimage to Qadian. He spoke about his discovery in Urdu and Punjabi on a public platform in Qadian where rural folks assembled to honour a scientific genius among them.

After retirement, I wanted to engage myself full time to History and Philosophy of Science. I discovered Rajinder Singh in University of Oldenburg, Germany, who is a trained Historian of Science, and author of nearly two dozen books. I had written reviews of his several books [21]. I proposed to Rajinder that we should focus on the contributions of Punjabi scientists who are the products of Lahore School of Punjab University set up in 1882. Rajinder is engaged in digging up the history of Kolkata School, which has produced Nobel Laureate CV Raman and nearly half a dozen other giants in Indian science, e.g., JC Bose, DM Bose, SN Bose, et al.

Philosophy of Science is another area of my interest. During my M.Sc. studies in AMU Aligarh, I developed some keen interest in Metaphysics and Greek Philosophy. Prof. M.A. Baig, our Warden of Jamal Hostel, was my motivator. He was an Educator and Philosopher of Science. The real impetus came

after my Ph.D. thesis in Marie Curie University, Paris. My thesis was a turning point in my life. I opposed the hypothesis of a new Lepton proposed by my Thesis supervisor, Tsai Chu, and submitted my findings in the form of a thesis contradicting his work. My thesis was accepted by the jury and degree was awarded. But the idea what is “Nature of Reality” in scientific research in general and in the Universe, in particular, never left my mind. I have published some papers and delivered several Seminar talks on this topic. I organised a National Seminar on History and Philosophy of Science in GNDU in 1987 and presented my paper “*Reality: Physical, Metaphysical and Mystical*” [2]. Prof. Yash Pal, the renowned physicist of India, presided over this Seminar and delivered the keynote address.

I have started searching for the solution of the reality problem in the domain of Religion. I undertook the study of religious scriptures of major religions of the world but my main focus is on the Sikh scripture “Sri Guru Granth Sahib (SGGS)”. I also believe that a Dialogue between Science and Religion is need of the hour for the World Peace. I was recipient of Honourable Mention Award of Templeton Foundation (USA) for a Project “*Global Perspectives of Science & Sikh Religion*” in 2005. My Paper “*Nature of Reality in Science and Sikh Religion*” was published in the proceedings volume of an International Symposium “*Mastery Meets Mystery: Intersecting Science, Philosophy, Religion and Culture*” in 2015 [10]. This topic has been elaborated in my book “*Scientific Vision in Sri Guru Granth Sahib & Interfaith Dialogue*” published by Singh Brothers, Amritsar, in 2007 [39].

My teaching career spans over forty years and I am fully conversant with the problems of teaching physics from School stage to University level. I started my foray into this domain during my service in PU Patiala. My survey report “*Teaching of Science in Punjab Schools - A Critical Survey*” was published in NCERT Journal 'School Science' in 1976 [40]. After retirement, I was elected as President of Indian Association of Physics Teachers (IAPT) in 2005 during the International year

of Physics. My association with IAPT started in 1984 and I have contributed more than 2 dozen articles on problems of Science education. IAPT is running its Bulletin since its inception and engaged in innovative laboratory improvement exercise. My paper “*Enigmas (Puzzles) in Teaching and Learning of Physics*” was published in Omni Science in 2016 [12].

Teaching of Science in Punjabi medium was the aim and objective of Punjabi University, Patiala. During my service of 14 years in this university, I wrote 6 books and awarded 3 prizes under medium switch over programme. I was fully devoted to prepare text books at B.Sc. level but this scheme fizzled out before its implementation. All these books are rotting in the stores of the university and my labour gone waste.

Popularization of Science was another area of my interest. After my several visits to ICTP, Trieste (Italy) and discussions held with its Director, Professor Abdus Salam, I wrote a proposal for setting up Centre for Promotion of Science in GNDU Amritsar. This centre was functional for 5 years (1990-95) and I wrote three books for High School students, including translation of “*Ideals and Realities*” written by Abdus Salam into Punjabi under the title “*Adarsh Ate Haqiqat*”. Since there was no matching grant provided by the Punjab Government, as envisaged under the terms and conditions, we had to close this project.

Punjab State is suffering from many maladies mostly created by its own people. After the Green Revolution, the farmers became prosperous in Punjab. The tempo of this revolution is lost and due to over-exploitation of soil and groundwater resources in Punjab, the ecological balance has suffered an irreversible loss. I am presently concerned with Punjab ecology and involved in investigations of Uranium and Heavy Metal hazards to population of Punjab [30–35]. My reports are based on groundwater data available with Punjab Water Supply and Sanitation Department (PWSSD), Government of Punjab.

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