



# Great Indian Scientist

**Acharya Prafulla Chandra Ray (2 August 1861 – 16 June 1944) was an eminent Bengali chemist, academician and entrepreneur and the father of Chemistry in modern India.**

Acharya Prafulla Chandra Ray was an eminent Bengali chemist, academician and entrepreneur and the father of Chemistry in modern India. The Royal Society of Chemistry honoured his life and work with the first ever Chemical Landmark Plaque outside Europe. He was the founder of Bengal Chemicals & Pharmaceuticals, India's first pharmaceutical company. He is the author of *A History of Hindu Chemistry from the Earliest Times to the Middle of Sixteenth Century* (1902).

A more remarkable career than that of P.C. Ray could not well be chronicled", wrote *Nature*, the famous international scientific journal, while commenting on the first volume of Ray's autobiography. Prafulla Chandra Ray was the founder of the Indian School of modern chemistry. He was a pioneer of chemical industries in India. Ray's activities were not confined to his laboratory and teaching. His activities concerned with all spheres of human interest—educational reform, industrial development, employment generation & poverty alleviation, economic freedom and political advancement of the country. He was a pioneer in social reform in the country. He took to social service with a missionary zeal. He

was a great critique of the prevailing caste system in the Hindu society.

In his Presidential address to the Indian National Social Conference in 1917 he made a passionate appeal for removal of the caste system from the Hindu society. Ray was an ardent advocate of the use of the mother tongue as medium of instruction in schools and colleges. In recognition of his contribution towards the advancement and enrichment of Bengali language, he was elected the General President of the Bangiya Sahitya Parishad (1931-34). Ray symbolized the best of Indian tradition and philosophy.

He lived a life of extreme self-denial. He became a symbol of plain living. Mahatma Gandhi said: "It is difficult to believe that the man in simple Indian dress wearing simple manners could possibly be the great scientist and professor.

There is no better document to know about Ray and his thoughts and accomplishments than his autobiography entitled *Life and Experiences of a Bengali Chemist* in two volumes. Besides giving his life-sketch, it gives glimpses of the intellectual history of Bengal in particular and India in general. "It is, in fact, a history of intellectual renaissance in Bengal as part of the larger enlightenment of India in the nineteenth century and in the early decades of the twentieth century." In the preface to his autobiography Ray wrote: "While a student at Edinburgh I found to my regret that every civilized country including Japan was adding to the world's stock of knowledge but that unhappy India was lagging behind. I dreamt a dream that, God willing, a time would come when she too would contribute her quota.

## Early life and education

Prafulla Chandra was born on 2 August 1861 in Raruli-Katipara, a village in the District of Khulna (in present day Bangladesh). His early education started in his village school. He often played truant and spent his time resting comfortably on the branch of a tree, hidden under its leaves. After attending the village school, he went to Kolkata, where he studied at Hare School and the Metropolitan College.

The lectures of Alexander Pedler in the Presidency College, which he used to attend, attracted him to chemistry, although his first love was literature. He continued to take interest in literature, and taught himself Latin and French at home. After obtaining a F.A. diploma from the University of Calcutta, he proceeded to the University of Edinburgh on a Gilchrist scholarship where he obtained both his B.Sc. and D.Sc. degrees.

He was awarded the Hope Prize which allowed him to work on his research for a further period of one year after completion of his doctorate. His topic of research was- Conjugated of Group- A Study and Molecular Combinations. While a student he was elected Vice-President of Edinburgh University Chemical Society in 1888.

Ray's father Harish Chandra used to harbour an ambition to send at least one of his sons to England for higher education. As his economic situation deteriorated he had no scope to realize his dreams. However, Prafulla Chandra knew about his father's dreams and decided to prepare for the Gilchrist Scholarship — a scholarship awarded by the Edinburgh University, which was open to students all over the world. While the examination for the scholarship was equivalent to the Matriculation standard of the London University, it required knowledge of at least four languages. It is said that though being ridiculed by his

classmates, Ray continued with the preparation for the examination.

Ray came out successfully in the competition. He was one of the two winners of the Scholarship from India. The other candidate was one Bahadurjee from Mumbai. They were the first Gilchrist Scholars from India. Ray's parents were too glad to give their consent for his going to England. And so armed with the Scholarship Ray sailed for England by S.S. California in the middle of 1882. Ray was received in England by Jagadis Chandra Bose, who had already been a student of the Cambridge University for about couple of years. Cambridge was expensive and it was meant for the elite. Both Bose and Ray became great friends for the rest of their lives. In England he joined the University of Edinburgh as a student in the BSc class. He was taught by Alexander Crum Brown (1838-1922).

## Back to India

In 1888, Prafulla Chandra made his journey home to India. Initially he spent a year working with his famous friend Jagadish Chandra Bose in his laboratory. In 1889, Prafulla Chandra was appointed an Assistant Professor of Chemistry in the Presidency College, Kolkata temporary Assistant Professor of Chemistry in 1889.

Ray who had a doctorate in science from Edinburgh University felt deeply aggrieved when even with his excellent educational credentials he was not able to secure a position within the Imperial service (his academic position was within the 'provincial service') and attributed this to the discriminatory attitude of the ruling government towards native intelligentsia. He complained to the top officials of the government but with no effect.

In 1896 His publications on mercurous nitrite and its derivatives brought him recognition from all over the world. Equally important was his role as a teacher - he inspired a generation of young chemists in India thereby building up an Indian school of chemistry.

Famous Indian scientists like Meghnad Saha and Shanti Swarup Bhatnagar were among his students. Prafulla Chandra retired from the Presidency College in 1916, and joined the Calcutta University College of Science (also known as Rajabazar Science College) as its first "Palit Professor of Chemistry", a chair named after Taraknath Palit.

In 1921 when Prafulla Chandra reached 60 years, he donated, in advance, all his salary for the rest of his service in the University to the development of the Department of Chemistry and to the creation of two research fellowships. The value of this endowment was about two lakh rupees. In 1936, at the age of 75, he retired from active service and became Professor Emeritus.

## Bengal Chemical

Ray started his Bengal Chemical and Pharmaceutical Works Ltd. (or Bengal Chemical as it is popularly known) in 1892 with a view, that it would create jobs for the unemployed youth. To establish it, he had to work under the most adverse circumstances. But he worked hard. To quote him: "Every afternoon on returning from the college (4:30 pm) I used to go through the previous day's orders and to see that they were executed promptly. The migration from my college laboratory to the pharmacy laboratory was to me a recreation and a change of occupation. I would at once throw myself into my new 'job' and work at a stretch from 4:30 pm to 7 pm and clear the file. When work is coupled with a keen sense of enjoyment it does not tell upon your health; the very idea of locally manufacturing pharmaceutical preparation, which hitherto had to be imported, acted like a tonic."

Sir John Cumming in Review of the Industrial Position and Prospects in Bengal in 1908 observed: "The Bengal Chemical & Pharmaceutical Works Ltd., is one of the most go-ahead young enterprises in Bengal. Dr. Prafulla Chandra Ray, D.Sc., FCS., started it as a small private concern in Upper Circular Road about 15 years ago and made drugs from indigenous materials. About six years ago it was made into a limited liability company, with a capital of two lakhs. Many of the leading chemists are share-holders. It has now a well-thought out and well-managed factory with about 70 workmen, at 90 Maniktala Main Road. Babu Rajshekhar Bose, the Manager, is an M.A. in Chemistry. The variety of manufacturers of laboratory apparatus, which requires skilled craftsmen in wood and metal, has been taken up. The latest development is in perfumes. The enterprise shows signs of resourcefulness and business capacity, which should be an object lesson to capitalists of this province."



Acharya Prafulla Chandra Ray  
Government College at Matigara.



## Acharya Ray as philanthropist

Ray gave away most of his earnings in charity. According to one estimate Ray spent nine-tenths of his income on charity. In 1922 he made an endowment of Rs.10,000 for an annual prize in chemistry, named after the great Indian alchemist Nagarjuna. He also made an endowment of Rs.10,000 in 1936 for a research prize in zoology and botany named after Asutosh Mookerjee. He supported many poor students. At the time of his retirement Ray donated Rs.180,000 to the Calcutta University for the extension and development of the Chemistry Department. He did not accept any salary from Bengal Chemicals, which he donated for the welfare of the workers. Ray died on June 16, 1942 in his living room in the University College of Science of the Calcutta University surrounded by his students (whom he loved most), friends and admirers. Ray's philosophy of life was beautifully summed up by Professor F. G. Donnan of the University College of Science, London on the occasion of Ray's 70th birthday. Donnan wrote: "Sir P. C. Ray, however, has been throughout his life no narrow laboratory specialist...His ideals have always been hard work and practical good in service of his country. Though devoted to the cause of pure science, he has never been impractical dreamer in the clouds. But he has never asked much for himself, living always a life of Spartan simplicity and frugality—Saint Francis of Indian Science. I hope that future ages will cherish his name as one band of self-denying and devoted men who received and handed on the flame that once burnt so brightly in India, the search for truth and hidden mysteries of things."

Vigyan Prasar