BIOGRAPHY

The Genius of Prof. Puran Singh

*D. P. Singh, Ph. D.**

A GREAT VISIONARY, RENOWNED scientist, a humanist and a mystic poet - Professor Puran Singh was perhaps the first eminent chemist born in Punjab. The founder head of the Department of Chemistry of Forest Products at the Forest Research Institute, Dehradun, Puran Singh, pioneered many chemical efforts in the utilization of forest products. He was one of the new breed of scientists who flowered in the subcontinent at the fag end of nineteenth century and founded the base on which the edifice of today's Indian science rests.

Puran Singh was born on 17 February 1881 in a small village Salhad of Abbotabad district in NWFP (now in Pakistan). His father, S. Kartar Singh was a government official, who had to remain away from home because of the exigencies of his official work. So Puran Singh spent his childhood with his mother Parma Devi in Dera Khalsa village of Rawalpindi district (now in Pakistan). His mother was a pious lady of religious temperament. During his formative years Puran Singh was deeply influenced by his mother.

Puran Singh received his primary education in *Madrassas.* He learnt the Gurmukhi script from Bhai Bela Singh in the village Gurdwara. He was a brilliant student during his school days. He passed the matriculation examination from the Mission High School, at Haripur. He passed his F.A. examination in 1899, from D.A.V. College, Lahore. In 1900, he went to Japan and joined Tokyo University to study pharmaceutical chemistry. All his expenses were met by the funds raised by the enlightened Punjabi people of Rawalpindi.

Puran Singh's student days at Tokyo were eventful. He being an emotional young man, first became a Buddhist monk and later, after a chance encounter with Swami Ram Tirath- turned into a Vedantin. He also dabbled in student politics and became a resident-secretary of the Indo-Japanese Club in Tokyo. The club was a platform for the revolutionaries (freedom fighters struggling for the independence of India) to meet together, discuss matters and give vent to their feelings. He began publishing a journal called *The Thundering Dawn* through which he strived to project to the outside world the travails of Indians under the colonial rulers.

After receiving a certificate of higher education in Pharmaceutical Chemistry from the Tokyo University Puran Singh returned to India on 28th September 1903. For his political activities in Japan the British arrested him as soon as he landed in Calcutta. However his parents got him released and brought him to Lahore. Puran Singh's life after his return

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to India in 1903 - till his death in 1931, was quite unsettled.

There was hardly any opportunity for a foreign trained scientist in those days so he did not get any job offer on his return. Due to his enterprising nature, and to repay the debt of the funds sought from his community to finance his studies, Puran Singh, set up a small distillation unit at Lahore to extract and manufacture essential oil from geranium and citrus oils. Despite initial success, his enterprise failed to sustain for long as he could not pull together with his business partner Bhagat Ishar Dass. In an emotional outburst he destroyed the entire apparatus. After dismantling the distillation unit, he took up Principalship of the Victoria Diamond Jubilee Hindu Technical Institute.

Two years later, in 1906, he moved to Dehradun to set up a soap factory at Doiwala in partnership with Lala Jyoti Sarup. He sold off this factory a year later to join the Forest Research Institute at Dehradun as a chemist. Here he set up his own laboratory in the Department of Chemistry of Forest Products starting from scratch. With availability of suitable facilities and conducive atmosphere for research his interests in essential oils were rekindled. He delved full time into analyzing, extracting and isolating essential oils from many forests trees and plants such as Eucalyptus globules, geranium, wintergreen and sandalwood. He also developed a new condenser for distillation of camphor oil.

Tannin and tannin-bearing materials attracted the attention of Puran Singh from the very beginning of his research career. Tannins are a group of organic chemicals obtained from plants and are used in processing leather. He not only identified exploitable tannin bearing materials in India but also made them known to the Government and public through his publications and presentations of his research papers.

In his research paper presented at the Fifth Indian Industrial Conference held in Lucknow on 30th December 1909 he presented a list of 19 tannin-bearing materials of India and brought out that tannin materials of India compared favourably with the raw materials of Europe and America in their contents. He carried out studies on tannins of mangrove (*Rhizophora muocranata),* myrobalans *(Pistacia integerrima)*, Arwal *(Cassia auriculata)* and walnut. He also extracted tannins from the Indian Oak *(Terminalia tomentosa)* and Burmese myrobalans. By using a freshly prepared nickel hydroxide, he devised a new chemical test for estimation of tannins.

Being very keen on promoting the essential oils industry in India he realized the dire need of a sound base of Chemistry of essential oils. Keeping this in view he determined the oil yielding qualities of many oilseeds. He also devised improved methods of extraction, distillation and purification of turpentine oil from various sources like *Chir* resin and pine trees like

Pinus khasya, *Pinus merkusii* and *Pinus excelsa*. Along with a British scientist, Puran Singh also devised a technique for manufacturing charcoal bricquets from Indian woods. Some engineers at Indian Institute of Technology, New Delhi, are now looking into reviving this technique. He worked as forest Chemist in the Forest Research Institute, Dehradun, during 1907-18 and sought pension to work with the Maharaja of Patiala for a while.

After his retirement, when he was under the employment of Maharaja Scindia of Gwalior (1919-23) Puran Singh started cultivation of Rosha grass and *Eucalyptus globules* in barren lands and set up a factory to extract essential oils from these. The oil was being exp-rted to England. His work on cultivation of sandalwood and extraction of its oil promoted the sandalwood oil industry in India. He also collected a variety of oil-seeds from forests and tested their utility as sources of essential oils. He took keen interest in the cultivation of drug yielding plants in the Indian forests. He tried to assess therapeutic value of sandalwood oil and wintergreen oil as well. For his pioneering efforts he was chosen as a Member of the Chemical Society of Japan and Royal Chemical Society of London, two prestigious institutions of the Chemists.

During 1923-24 Puran Singh worked as an Adviser and a Chemist at Sardar Nagar Sugar Factory, owned by Sir Sunder Singh Majithia, and developed a process for decolourising sugar without using bone charcoal. There is also a patent in Puran Singh's name, of this novel technique of cleaning and discolouring crystal sugar from raw sugar. The technique was immensely liked by the sugar manufacturers of that time as it did away with the use of bone charcoal, which was detested by the users for religious reasons. His research efforts were greatly appreciated at the Indian Science Congress held in 1925 at Benaras Hindu University, Varanasi.

As a Chemical Advisor to the Government at Forest Research Institute, his services were utilized by the then Govt. in solving the problems faced by the sick forest-based industries in India and Burma. The British government was so impressed by his research efforts that in November 1926 the Punjab Government allotted him land in the *Bar* region for cultivation of Rosha grass, but the heavy floods in 1928 caused havoc to his work. In 1930 he was diagnosed a victim of TB which was then incurable, and he breathed his last on 31 March 1931 at Dehradun.

Throughout his research career, he published about 53 research papers on various topics of interest to forest chemists. He investigated all important classes of minor forest products, like tannins, essential oils, oils and fats derived from seeds of forest trees, shellac, etc. While going through his publications one can easily see his analytical ability, depth of knowledge in the subject and depth of

involvement with his research problem.

Puran Singh was not only a scientist but was a humanist and mystic poet as well. His literary works run into some two-dozen volumes in English, Hindi and Punjabi. Puran Singh was a uniquely fertile and productive mind. He tried his hand at almost every genre touching a variety of subjects. His poems, mostly in blank verse, which he introduced in Punjabi literature, are a beautiful specimen of emotion touched with a mystic element. As a poet he has generally been compared with Walt Whitman, the great American poet. Poetic strands also mark his prose since he was of the firm view that expression of truth is ever poetic.

His works on Sikhism are relevant to modern-day ideal insofar as they define a Sikh as one who leads his spiritual and social life in tune with the teachings of the Gurus. They lay great emphasis on the moral aspect of these tenets. The wearing of external symbols without the cultivation of values of *Gurbani,* is to Puran Singh, like worshipping the dead – a sterile exercise. With his immense contribution in the diverse fields of science, literature and spirituality, he shall ever remain an inspiring figure among the guiding stars of our nation.

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