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# **Trials, Tribulations, and Joys of Punjab's First Scientist**

**Ruchi Ram Sahni (1863–1948)**

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Ruchi Ram Sahni (1863–1948) was a scientist, science educator, social reformer, and in later life, an active participant in political affairs. He was born in 1863 in Dera Ismail Khan, now in Khyber Pakhtunkhwa Province in Pakistan, to Karm Chand Sahni and Gulab Devi. His father was a wealthy merchant [1].

## **Ruchi Ram Sahni: The Student**

At the age of five or six years, Ruchi Ram was inducted into the family business and provided a wooden *takhti* (a small stool) and a reed pen. The day, much celebrated by the family, was marked with the distribution of sweets to neighbours and friends. As was the practice at the time in business families, he was assigned to a *pandah* (teacher) who taught him multiplication tables and some general arithmetic. In no time at all, he learnt tables up to 20 times 35 along with the fractional tables, and by the age of six, Ruchi Ram was an active member of the business community.

Before long, tragedy struck the Sahni family. The family business collapsed because their ships capsized in Indus river in a storm, and the family fell from riches to rags.

Despite their poor economic situation, his father wanted Ruchi Ram to study. He attended the local school at Dera Ismail Khan. At the age of fifteen, Ruchi Ram Sahni left his childhood home in Dera Ismail Khan to go to Jhang, a small town in the Punjab province on the east bank of Chenab, to attend high school at a distance of 100 miles. It is said that young Ruchi Ram walked through the sandy desert, crossed Indus in a country boat, and travelled on a camel back for three days before finally reaching Adhiwal, near Jhang, where the high school was located. But Ruchi Ram was restless and did not find high school very stimulating. In a dramatic turn of events, Ruchi Ram, when he was sixteen, decided to run away to Lahore during the Dussehra break to join the Government High School. Carrying a few books and clothes in a bundle, he reached the nearest railway station about 50 miles away and travelled to Lahore. He went straight to the headmaster and demanded that he be given admission in the Government High School.

Ruchi Ram Sahni was interested in a range of subjects. While science and mathematics were his first choice, he was also fond of English literature, particularly poetry. During his college



days in Lahore, Ruchi Ram and his friends would discuss Mill's utilitarianism and Bentham's theory of legislation for hours on end. He was fluent in English, Persian, and Punjabi and was amongst the first generation of English educated Punjabis.

School and college life in Lahore transformed young Sahni. For the first time, he was exposed to new ideas about secularism and became a staunch member of the Brahmo Samaj movement in Punjab. He was opposed to the rising tide of Hindu nationalism and felt that it was divisive. He got deeply involved in Gurdwara reform and also did *kar seva* for cleaning the Golden Temple in Amritsar.

But his first love was science. He was not only a student at the Government College, Lahore, but also taught science there for 31 years. He joined as an Assistant Professor of Science (physics and chemistry) at the Government College, Lahore, from where he retired as a Senior Professor of Chemistry on 5th April 1918, at the age of fifty-five.

### **Ruchi Ram Sahni: The Scientist**

Before joining the Government College, he spent two years with the Indian Meteorological Department during 1885–87. He was appointed as the Assistant Meteorological Reporter to the Government of India. His two years in Simla and Calcutta – the headquarters of the Indian Meteorological Department – were a great learning experience. He was not only entrusted with crucial responsibilities by his boss, H F Blandford (FRS) but also had the opportunity to pursue an M.A. degree from Presidency College, Calcutta.

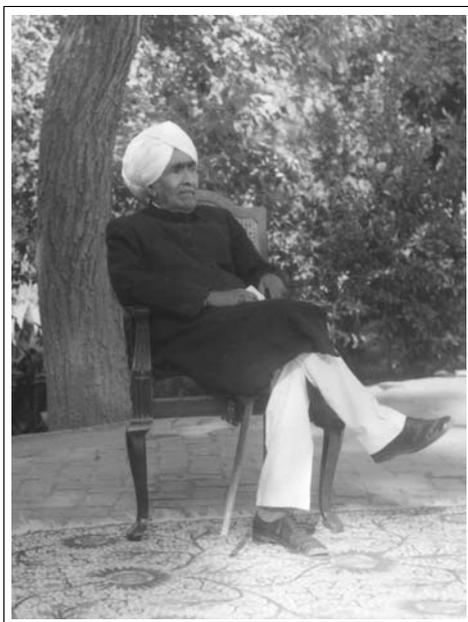
Once, when his boss was out of town, Ruchi Ram received the daily weather report which showed signs of an approaching cyclone near the Bengal coast. As was the practice at the time, the data upon which the daily report was based comprised the record of weather conditions as observed at about 120 stations all over India and Burma, and reported to the Simla office by telegraph every morning. The report was generally ready by 4.30 the same evening when it was sent to the Government Press at Simla. At the same time, a summary of the report was telegraphed to all the daily papers in India. On this particular day, Ruchi Ram Sahni noticed that Diamond Harbour had reported an unusually rapid fall in atmospheric pressure. There was nothing in the reports from the surrounding stations to explain or support this. His bosses were away in Calcutta. In his autobiography, Sahni says, "I had an urgent telegram sent to the 'Observer' at Diamond Harbour asking him to send me a fresh report of the latest readings. This report confirmed my original suspicion that a big storm was approaching. I then asked him not to leave the observatory till further orders, and to keep sending me half-hourly reports on the weather. A little later, I asked two or three of the other neighbouring stations also to do the same. Meanwhile, I was also making a hurried study of the reports of previous big



storms. It was only when I was quite convinced in my mind that a big storm was approaching the coast that I issued the immediate danger signals.” When his bosses heard that he had sent such an important signal on his own, they were perturbed. The storm was severe and was known as the ‘False Point cyclone’. According to Kochhar, “False Point cyclone.....ranks as one of the severest cyclones in the recorded history of Bay of Bengal. The damage due to the cyclone was minimal, thanks to the scientific acumen of a 22-year-old Indian meteorologist who, though placed on the lowest rung of official hierarchy, boldly issued the red alert on his personal responsibility without caring for a green signal from his superiors” [2].

Ruchi Ram Sahni was the first Indian meteorologist, but he was never given credit for his work. In fact, he says in his autobiography that his appointment was challenged by one of his European colleagues who wrote in an important newspaper – *Pioneer of Allahabad* – “...that the time had not come for a ‘native’ to be appointed to a responsible scientific post”. As Ruchi Ram recalls about the report by his colleague, “He had no grievance, he pointed out, against the particular individual who had been put in charge of the onerous duties for which a European alone was considered the fittest person. The criticism closed with the reference to the fact that the daily weather report was sent to foreign countries, including Russia, and that the Russians would have but small regard for the Government of India when they realised that a native had been appointed to such a responsible post.”

However, the False Point cyclone was such a major cyclone that it was written about in many



**Figure 1.** Ruchi Ram Sahni



scientific journals. More than 5,000 people lost their lives, and many more would have lost theirs if the storm warning had not been issued on time. Although his superiors rebuked him for taking the action he did, it was his boss who decided to write about the cyclone, and Sahni was not credited at all. Ruchi Ram Sahni says, “I suppose a native was not considered to be a fit person to write the paper.”

Apart from the opportunity to learn about weather prediction, it was in Calcutta that Ruchi Ram Sahni first attended lectures on popular science at Dr. Mahendra Lal Sircar Institute. These talks inspired him and Professor Oman of the Government College to start the Punjab Science Institute at Lahore in 1887.

The original idea was that the Institute would popularise science through lecture demonstrations. However, Ruchi Ram also had other ideas. He felt that science could never reach the masses till rural schools were not equipped with laboratory instruments. But such equipment was expensive and had to be imported from Britain. Ruchi Ram was of the opinion that laboratory equipment should be made and repaired in India so that it was affordable, and he soon set up the Punjab Science Workshop – which he described as his youngest child – to make his dream a reality. The workshop produced such high-quality equipment that at an important scientific conference in Poona (now Pune), when he stayed with M G Ranade, Ruchi Ram was accused of passing off equipment made in England as his creations. The Inspector of Schools felt that such high-quality equipment could not be made in India.

The Punjab Science Institute and Workshop were hugely successful. But Sahni was by that time involved in a number of other issues and could not devote enough time to these institutions. These were hence handed over to another scientific institution to carry the work further. Ruchi Ram Sahni was a committed teacher and funded his own experiments, which he conducted not only in laboratories but also in the street corners of Lahore and surrounding rural areas. So popular were his street-side demonstrations and his efforts at demystification of science that he was often invited by the *Rajas* and *Nawabs* of the princely states to perform experiments on a range of subjects such as electric waves, pure and impure air, electroplating, glass-making, and more. Many of his public lecture-cum-demonstrations were given in Punjabi using the magic lantern for students and ordinary people. He gave more than 500 public lectures, mostly in Punjabi.

Unfortunately, Ruchi Ram Sahni faced a lot of harassment from his European bosses, and he describes at length his experiences. He was not one to take things lying down and reported to the authorities issues such as leakage of examination papers, teachers favouring students, and so on. These issues are described at length in his memoirs. It was therefore not at all surprising that although he was the most senior Professor of chemistry in Government College, Lahore,



the authorities decided to get a much younger man without any teaching experience to become the Head of the Department.

This came as a huge shock to Sahni, and he decided that very moment to go away to Germany on a sabbatical. At the age of 51, he began to pursue research on radioactivity, a subject in which he had been interested for long. In 1914, he moved to Karlsruhe in Germany but had to leave for England at the start of the First World War. Here, he joined the famous Manchester Laboratory, where he worked under the guidance of Ernest Rutherford and Niels Bohr. This research was published in the *Philosophical Magazine* in 1915 and 1917.

After returning to Lahore in 1916, he went to work in Professor C V Raman's laboratory in Calcutta for a few months. In 1920, when C V Raman visited Lahore, it was reported by *The Tribune* that Raman at a public gathering had called Ruchi Ram Sahni 'the doyen of education in the Province'. He said that he had seen some of Professor Sahni's work in science journals before he had met him and had felt at once that he was a fellow worker in the same field [3].

Sahni's contribution to chemistry in Punjab was acknowledged by the Indian Chemical Society, Lahore Branch, in 1927. *The Tribune* reported that Dr. Duncliffe, the President of the Society at the time, 'eulogised the services of Professor Ruchi Ram Sahni who worked inside and outside the College for the progress of chemistry in its early stage' [4].

### **Ruchi Ram Sahni: The Father**

Ruchi Ram Sahni was an adventurous man and an indulgent father. He had five sons and four daughters. Birbal Sahni and Mulk Raj Sahni followed their father's footsteps to become scientists. Birbal Sahni was a famous paleobotanist and Fellow of the Royal Society, who founded the Institute of Paleobotany in Lucknow. Mulk Raj was a geologist with the Geological Survey of India.

Mulk Raj Sahni in his autobiography relates an incident from 1905 when he was about six years old. His older brother, Birbal, then eight years old, took him and their sister (possibly Lajwanti) to look for crabs in a stream in Murree without informing anyone in the family. It was quite dark by the time they returned, with bleeding feet and tears from climbing boulders and rocks, and the household was in a turmoil. When asked by his father why he had taken his younger brother and sister without permission and what had they been up to, Birbal stood up and said that they had gone to catch crabs from the stream. The three children expected more than a shouting from their father. But Ruchi Ram Sahni being an adventurous man himself, did not say anything except, "Crabs, indeed!"

Mulk Raj recollected, how many years later, their father took him and his brothers on many



adventures more dangerous than Project Crab. He described how they crossed the Machoi Glacier not far from the Zojila Pass in 1911 wearing rope-made slippers. It was here that looking down they saw in a gaping chasm, a horse standing upright, frozen and preserved in its icy grave. Between 1907 and 1911, Birbal and Mulk Raj went on many Himalayan excursions with their father. As Mulk Raj says, “.....despite his disciplinarian attitude, he gave us almost total freedom of choice in essential matters.” Though he wanted his son Birbal Sahni to join the Indian Civil Service, when he was told that Birbal wanted to pursue botanical research, he agreed to let Birbal go to Emmanuel College, Cambridge, to study.

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