PIARA SINGH GILL (1911-2002)

Piara Singh Gill, a pioneer cosmic ray physicist, died 23 March 2002 at Atlanta, Georgia. Born on 28 October 1911 in Hoshiarpur District, Punjab, Gill used to trek 10 km daily to attend primary school. Graduating high school in 1928, he sailed for America, working initially as a taxi driver in Panama to earn money for his education. He was later awarded tuition scholarships at the University of Southern California, earning Bachelor's and Master's degrees there in 1935 and 1936. During this time, he picked fruit, scrubbed floors, and washed dishes to support himself.

During 1936-40, Gill worked at the University of Chicago for his PhD under Nobel Laureate Arthur Compton. His thesis established the 'latitude effect' in cosmic ray intensity at sea level. In the course of this work, he travelled 15 times between Vancouver, Canada and Hobart, Tasmania during 1937-38 in a regular passenger steamship, the *S.S. Aurangi*, where he had installed an ionization chamber shielded by a 12cm thick lead enclosure. In June 1939, Gill attended the International Symposium on Cosmic Rays, presenting a paper on the 'Size-frequency distribution of cosmic ray bursts', which described the first experiment to provide clues about meson spin.

On his graduation in 1940, Compton offered Gill a postdoctoral fellowship to continue his research at Chicago, but Gill was keen to carry out experiments on the azimuthal variation of cosmic ray intensity in India. So Chicago awarded him a travelling Research Fellowship, and Gill sailed for India in April 1940, joining Forman Christian College, Lahore as a lecturer in physics, where he also set up a cosmic ray research laboratory. In the summer of 1945, he organized an expedition to the Himalayas to study the production of mesons by the non-ionizing component of cosmic rays, but the results showed no production of mesons. Later, these experiments were repeated using RAF planes and meson production was detected at altitudes above 20,000 ft. In 1946, Gill visited the USA and Europe, delivering invited lectures on cosmic ray experiments carried out in India. Upon returning, he became a Professor at the Tata Institute of Fundamental Research (TIFR), Bombay, where he initiated high altitude experiments with hydrogen balloons. Gill resigned from TIFR the next year (probably due to personality conflicts with its then Director Homi Bhabha, himself an eminent cosmic ray physicist) and returned to the US to work at the Carnegie Institution of Washington, studying the relationship between solar flares and sudden increases in the intensity of cosmic rays, in collaboration with M. S. Vallarta and S. E. Forbush.

Gill was appointed to the Atomic Energy Commission when he returned to India. Soon thereafter, he was invited to work at the National Bureau of Standards, when he also assisted the Indian Embassy in Washington DC as Scientific Advisor. In 1949, Gill joined Aligarh Muslim University (AMU) as Professor & Head of the Physics Department where he spent a very fruitful decade-and-a-half. He took immediate steps to update course syllabi, improve physics instruction, and establish well-equipped research

laboratories. Under his leadership, AMU became a leading centre for physics research in India by the late 1950s. In September 1963, Gill was appointed Director of the Central Scientific Instruments Organization (CSIO) in Chandigarh. Under his leadership, CSIO established itself as a leader in instrument design in Asia. On retiring from CSIO in 1971, Gill joined Punjab Agricultural University, Ludhiana as Emeritus Professor. During this time, he also wrote high school physics texts in English, which I translated into Punjabi. Later, he became an entrepreneur, starting a company manufacturing magnetic heads for tape recorders. He sold the company to return to the US to spend the last years of his life with his daughter, Suristha G. Sehgal at Georgia State University, Atlanta.

Gill set an inspiring personal example to his students and colleagues. He was always punctual and never missed lectures, despite a busy schedule of non-academic engagements. His students eventually came to occupy eminent positions in Indian universities and scientific establishments. He was a first-class researcher, a teacher of teachers, an institution builder, an administrator and an entrepreneur who spent significant chunks of his career both in India and the US. Even in the Indian context, his is the story of a person from humble beginnings rising to great prominence in scientific and public life. His career is truly a testament to the power of the individual to succeed against all odds. His autobiography *Up Against Odds,* is compelling, inspirational and educative reading. May his soul rest in peace!

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