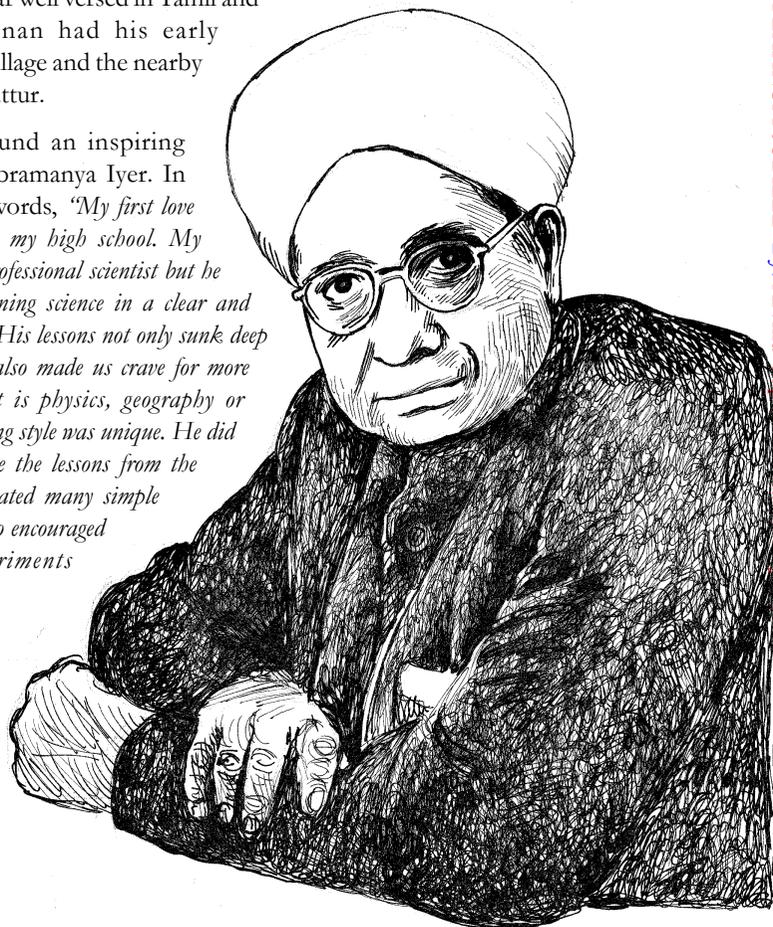


Kariamankam Srinivasa Krishnan (KSS for short) was born on 4 December 1898 in the village of Watrap in the Tirunelveli district of Tamil Nadu. His father was a scholar well versed in Tamil and Sanskrit. Krishnan had his early schooling in his village and the nearby town of Srivilliputtur.

In school he found an inspiring teacher in Sri Subramanya Iyer. In Krishnan's own words, "My first love for science came in my high school. My teacher was not a professional scientist but he was good at explaining science in a clear and captivating fashion. His lessons not only sunk deep into our mind but also made us crave for more science. Whether it is physics, geography or chemistry, his teaching style was unique. He did not simply reproduce the lessons from the book. He demonstrated many simple experiments and also encouraged us to do experiments ourselves."



In school he was once asked to write an essay on the Archimedes principle. In his assignment Krishnan also added an instrument he had constructed, on his own, for measuring density. Later he was surprised to find that the same instrument had been invented years earlier and was called the *Nicholas Hydrometer*. This was perhaps his first brush with independent research.

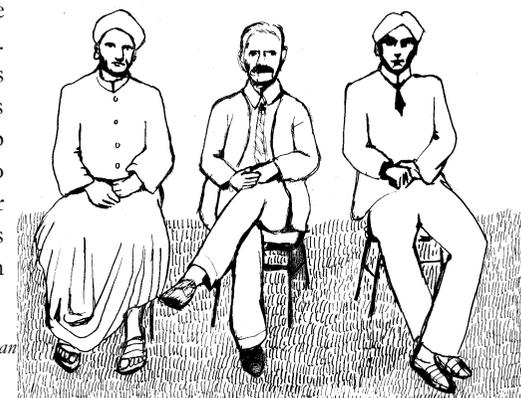
Krishnan attended the American College, Madurai (1914-1916) and later the Madras Christian College where he distinguished himself as a meritorious student by winning the Aberdeen Prize for Physical Sciences in 1918.

For the next two years Krishnan served as a Demonstrator in Chemistry in the Madras Christian College. Here he organized informal lunch-hour discussions where the students were free to discuss any question in physics, mathematics or chemistry. These seminars became so popular that many students from nearby colleges attended them too.

In 1920, Krishnan's name was recommended and he was to join the Solar Physics Observatory at Kodaikanal but by some quirk of fate it fell through. In retrospect it can only be seen as a big gain for physics.

Krishnan's heart lay in scientific research. In 1920, he enrolled in the MSc course at the University College of Science, Calcutta where Raman taught. After a good grounding in Physics he joined Raman as a full time researcher. His work in the laboratory began at 6 AM in the morning, often after an early walk and a cold water bath. He worked on the molecular scattering of light and X-rays in liquids. He also studied the magnetic anisotropy of gaseous molecules and crystals. But his interests were not confined to research alone. He avidly read books on literature, religion and philosophy.

In October 1928, Prof. Arnold Sommerfeld of Germany delivered a series of lectures on Quantum Mechanics at the Calcutta University. Krishnan carefully studied and collated the lectures into a booklet. Sommerfeld was impressed by Krishnan's originality and scholarship and even offered to publish the book under joint authorship. As was expected, Krishnan politely refused the offer.



Krishnan, Sommerfeld, and Raman

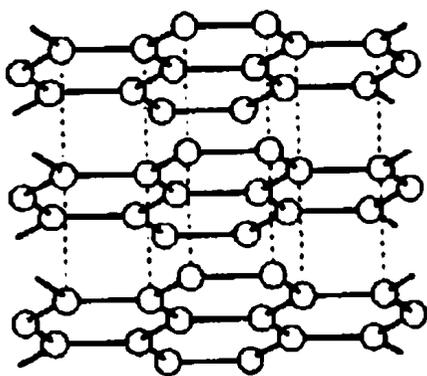
Krishnan's collaboration with Raman proved vital. At the instance of Raman he conducted experimental studies on the scattering of light in a large number of liquids, and its theoretical interpretations. He played a significant role in the discovery of *Raman Effect* for which the Nobel Prize was awarded in 1930. Raman himself generously acknowledged Krishnan's contribution to this momentous discovery. Though Krishnan played an important role in the discovery of the *Raman Effect* he did not pursue this subject later. He worked in the fields of magnetism, thermal conductivity and thermionics - a branch of electronics dealing with the emission of electrons from matter under the influence of heat.

In December 1928, Krishnan moved to Dacca University as a Reader in Physics. The department was then headed by the eminent physicist Prof. Satyendra Nath Bose. The congenial atmosphere delighted Krishnan and he worked with great enthusiasm. His low-cost, simple experimental procedures were jocularly described as *Sealing Wax and String* experiments by a foreign friend. He did extensive work on the magnetic properties of diamagnetic and paramagnetic crystals. In recognition of his contributions the Madras University conferred the DSc degree on him.

In 1933 Krishnan returned to Calcutta – the then scientific capital of India and took up the position of Mahendralal Sircar, Professor of Physics at the Indian Association for the Cultivation of Science.

Krishnan's investigations in light scattering and magnetic measurements were considered so profound that he was elected to the Fellowship of the Royal Society, London in 1940, at a relatively young age of 42.

The outbreak of war with Japan in December 1941 greatly disturbed life in Calcutta. There was the distinct possibility of academic institutions and research laboratories being closed down. So Krishnan accepted the offer of a Professorship in Allahabad University. Here he had to spend a considerable amount of time on administrative matters and hence his experimental work



The crystal structure of graphite, composed of carbon atoms linked by covalent bonds (indicated by solid lines), and weaker van der Waals bonds (dotted lines).

suffered. But as he was equally adept in theoretical work he soon turned his attention to developing a formula for the resistivity of metals and alloys. He was knighted in 1946. Just before India's independence he was invited to take up the position of the Director, National Physical Laboratory (NPL) at New Delhi.

In the late forties and early fifties Krishnan spent considerable time working with the Council of Scientific and Industrial Research, University Grants Commission, Atomic Energy Commission, and several other important government agencies. In 1954, he was awarded the Padma Bhushan and in 1957 the inaugural Shanti Swarup Bhatnagar Award.

In his personal life Krishnan combined deep scholarship of many disciplines with high human values of ethics and justice. He loved Sanskrit, Tamil literature and Carnatic music and had a marked sense of humour. Pandit Nehru once remarked that he had never met Krishnan without being told a new story! He played tennis and loved watching cricket. As one with a deep knowledge of science he was disturbed by its destructive capability and took active part in the peace movement.

During the construction phase of National Physical Laboratory, the contractor in his wisdom decided to cut down two problem trees near the entrance. Krishnan who was driving past was horrified and confronted the architect by asking, "Why are you cutting down these trees?" The architect replied, "Sir, we thought they looked asymmetrical in the landscape". Krishnan said, "You can still create symmetry. Not by cutting down a tree but by adding one more." Krishnan's deep sense of aesthetics and ethics is captured in this small vignette. When Prof. Krishnan died on June 13, 1961, he left behind his wife, two sons and four daughters, numerous colleagues and the whole nation to bemoan the loss.

