

Professor Daulat Singh Kothari: A Profile

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1. INTRODUCTION

In the passing away of Professor DS Kothari (Doctorsaab, as he was generally called with affection and respect), an institution, an era, and a legend have come to an end. He was an outstanding physicist, an educationist with a vision, an inspiring teacher, the architect of defence science in our country, and, above all, a great human being who symbolized the noblest traditions of Indian culture. He combined in himself profound scholarship, simplicity to the point of asceticism, humility, soft-spokenness, warmth, enlightenment, tolerance, as well as a passionate and abiding concern for the welfare of humanity. A true Jain, Kothari meticulously followed the principles of Right Conduct involving the practice of *Ahimsa*, *Satya*, *Asteya* and *Aparigraha*. He was deeply read in the Upanishads, the Gita, Buddhist and Jain scriptures. He believed in a holistic approach to the individual, science and society. He subscribed fully to Einsteins's dictum: 'Science is lame without religion, and religion is blind without science'. An admirer and friend of Acharya Vinobha Bhave, Kothari often used to quote the Acharya's statement: 'The days of religion and politics are over; the future belongs to science and spirituality'.

To Professor Kothari, knowledge was a ceaseless voyage of realization. Throughout his life he never ceased to be a student. He was a highly gifted teacher, informal and personal in his approach. His love for scholarship and teaching would be evident from the fact that he was associated with the Faculty of Physics of the University of Delhi right from 1934 till almost the

last days of his life; this association continued in an unbroken fashion even when he was the Scientific Adviser to the Minister of Defence and the Chairman of the University Grants Commission. It is no surprise that the Vice-Chancellor of Delhi University once said: 'Kothari is the conscience of Delhi University'. Professor Kothari was easily approachable by everyone, high or low. He had an extraordinary memory for names, and an interaction with him was an unforgettable experience.

2. BRIEF BIODATA

Daulat Singh Kothari was born in Udaipur on 6 July 1906. His paternal grandfather was Mohan Lalji, who was working in the Customs Department, and died in the 1918 plague. Mohan Lalji had a son, Fateh Lalji, and a daughter. Fateh Lalji took his MA in English from the Allahabad University, appearing as a private candidate. He was a popular teacher, who first worked as a headmaster in a government school at Bhilwara, and later as a headmaster in a government high school at Udaipur. (It is perhaps his father's influence that inspired Daulat Singh to fall in love with teaching in his later life.) Fateh Lalji's first wife died early without any child. By his second marriage to Lahar Bai (nee Ordia) he had four sons (Daulat Singh, Madan Singh, Duleh Singh and Pratap Singh) and a daughter (who died early). Among the sons, Pratap Singh is the only survivor at the present time. Mohan Singh (b. 1909) retired from service in the government of Rajasthan. Duleh Singh (b. 1912) retired as reader in the

department of physics, Udaipur University. Pratap Singh (b. 1914) is a paper technologist who served as Managing Director of NEPA Mills.

Fateh Lalji kept indifferent health and, after his father's death, at the persuasion of his friend Bapna Sahib, the then Home Minister of the State, he went to Indore for medical treatment, where he died in June 1918. Bapna Sahib took Daulat Singh (who was not yet 12 when his father died) under his care. Daulat Singh matriculated from the Indore Shivaji Rao High School in 1922 with science. He could not have done science had he stayed at Udaipur, where there was no provision for science teaching at that time. After completing his intermediate in science from Udaipur, Daulat Singh, it appears, wanted to become a watch-maker, but, thanks to a special scholarship awarded by the Maharana of Udaipur on the basis of his outstanding performance in the intermediate examination, he was able to go to Allahabad University for his higher studies.

Daulat Singh married Sujan Kanwar (nee Surana). With her gentle and self-effacing personality, Mrs Kothari was indeed an ideal companion and life-partner for him. It is in the fitness of things that his first son, Lakshman, followed his father's footsteps as a physicist; like his father he was a professor in the physics department of Delhi University, and, like his father, now continues as Emeritus Professor there. Lakshman's research interests are in the fields of neutron physics and solid-state physics. The second son, Lalit, is a distinguished (retired) professor of physiology. The youngest son, Jeevan, is a well-known architect.

Daulat Singh took his BSc degree from Allahabad University in 1926 and the MSc in physics from Allahabad in 1928. It was at Allahabad in 1924, as a first year undergraduate student, that he came into contact with Professor Meghnad Saha who was his teacher. This contact proved to be a great boon for science in our country. Saha was impressed by Kothari's diligence and brilliance. Saha not only taught him physics but also got him interested in the history of science and philosophy. As Kothari himself recalls¹, Saha came to Kothari's room in the Jain hostel one day in the evening of February 1927 and enquired whether he intended to appear at the competitive examination for government service. Saha was greatly pleased when told by Kothari that he had no such idea, and immediately offered the post of a demonstrator in the

physics department; Saha himself dictated the application which Kothari submitted the next day. Kothari got the offer in July 1928 as soon as his MSc results were announced.

Kothari worked at Allahabad for a short time. Very soon, he won a United Provinces (now Uttar Pradesh) government scholarship to pursue higher studies at Cambridge University. It is interesting to recall that the Indian High Commission in London had first fixed his admission at Oxford University against his wishes. In his characteristically modest way Kothari says that 'through the confluence of lucky coincidences', he was able to get the admission changed to Cambridge University¹. S Chandrasekhar had exactly the same problem, due to the bureaucratic approach of the High Commission, and he had to put pressure from different quarters to get the admission changed from Oxford to Cambridge. At Cambridge, Kothari worked under Lord Rutherford, Peter Kapitza and RH Fowler at the Cavendish Laboratory. It was here that he came into contact with Chandrasekhar; their friendship (as well as research interactions) continued unbroken throughout.

At Cambridge, Kothari originally felt that it was better to devote time to learn the new physics and mathematics from the great masters than to work within the narrow limits for a PhD. But, thanks to a strongly worded letter from Professor Saha in 1932, Kothari changed his mind. He got a 6-month extension of his 2-year scholarship through the influence of the Master of his College who was a member of the British parliament. (An earlier request strongly supported by Lord Rutherford had been abruptly rejected).

In 1933 he got his PhD from Cambridge University. He soon returned to India to rejoin his post in Allahabad University. In 1934, again at the insistence of Saha, he joined Delhi University as Reader in Physics. At that time there were only two teachers, Kothari and a demonstrator, in the department. There were no post-graduate courses in science subjects. He was made professor in 1942. One of the traditions that he set up was that every faculty member, be he a theoretician or an experimentalist, should participate in the laboratory supervision of students². He always made it a point to teach at least one subject to the first year BSc class. He would switch frequently from English to Hindi to communicate more effectively.

On 12 July 1948 he took charge as the first Scientific Adviser to the Minister of Defence. The scale of pay for the post was fixed at Rs 2000-100-2500 (at par with the pay scale of the Directors of the National Laboratories). But Professor Kothari would agree to take only Rs 1250/- as salary, which was the amount he was getting as a Professor. He also continued to reside in the university campus and never missed his teaching classes in the university. He rejoined Delhi University on 12 July 1952, but was specially requested by the Defence Ministry to continue as Honorary Scientific Adviser, a post that he held till March 1961. As Honorary SA, he was drawing a token pay of one rupee a month (because it appears that if he were to exercise the enormous financial powers vested in the SA, he had to get some salary from the government).

In March 1961 he took charge as Chairman, University Grants Commission, a post that he held till 1973. It was during this tenure that he was appointed Chairman of the Education Commission (1964-66); the report of this Commission, generally known as the Kothari Commission report, was a landmark in the annals of education in our country.

In 1981 he was appointed Chancellor of the Jawaharlal Nehru University (probably the only time an educationist adorned the post of Chancellor of an Indian university, which is generally the prerogative of the Governors; JNU was somewhat of an exception in that Mrs Indira Gandhi was its first Chancellor). He continued as Chancellor for two terms, till 1991.

Honours and awards came in plenty to Professor Kothari. In 1962 he was awarded Padma Bhushan and in 1973, Padma Vibhushan. He was the General President of the Indian Science Congress in 1964. In 1966 he was chosen for the Shanti Swarup Bhatnagar Award of the Indian National Science Academy (INSA). In 1973 he was elected Foreign Member of the USSR Academy of Sciences. During 1973-74 he was the President of the Indian National Science Academy. In 1978 he was awarded the Meghnad Saha Medal of INSA. Professor Kothari was a Fellow of the Third World Academy of Sciences, Trieste, Italy, a member of the Pugwash Conference, and a recipient of the award of the National Federation of UNESCO Associations in India.

3. PHASES IN PROFESSOR KOTHARI'S ACADEMIC CAREER

Professor Kothari's academic career can be broadly classified into the following four phases (there is no sharp line of temporal demarcation between them).

Phase I (1930-1950): Contributions to physics and astrophysics;

Phase II (1948-1961): Establishment and development of defence science in India (this is covered in a separate paper in this issue);

Phase III (1961-1966): Contributions to education; and

Phase IV (mid-1970's onwards): Involvement in questions relating to the philosophical foundations of science, inter-relationships of science, spirituality and humanism.

3.1 Contributions to Astrophysics

It is for his pioneering work in the theory of pressure ionization that Professor Kothari is internationally known. Professor Kothari's other interests were: statistical thermodynamics; quantum statistics; internal constitution of the stars; application of Ramanujan's partition theory of numbers to statistical mechanics, and interestingly, to high polymers; theory of fragmentation of large masses into stars; effects of radiation on the Lamb shift; theory of the magnetic monopole (an entity that Dirac had proposed in 1931).

3.2 Contributions in the Field of Education

The nation owes a deep debt of gratitude to Professor Kothari for his monumental contributions to the cause of education. The Kothari Commission's recommendations are of far-reaching import. As Dr LM Singhvi aptly put it, 'The Kothari Commission report, like Dr Kothari himself, was profound without being ponderous, idealistic without being impractical, fundamental without being fanatical'. (Dr Prem Kirpal, in an article in this issue, has dealt at some length with this aspect, interspersed with revealing personal glimpses of Professor Kothari's personality).

Professor Kothari took keen interest in the activities of the National Council of Educational Research and Training, and advised the NCERT on the writing of text books in science, and on standardizing technical terms in Hindi.

As Chairman of UGC, he helped raise the quality of advanced studies and research by providing the

necessary financial inputs and facilities. Although he was ascetic by nature, he was sensitive to current trends, and in later years supported generous funding not only for laboratory facilities but also for better pay scales, residential and office accommodation.

His advice and guidance were sought by many educationists and administrators. For example, the civil services examinations now conducted by the Union Public Service Commission are patterned on the model Professor Kothari suggested.

4. THE LAST YEARS

Professor Kothari had been keeping indifferent health during the last 10 years of his life. Although physical infirmity prevented him from indulging in his favourite pursuit of lecturing on physics to students at the University, he was mentally alert to the last. He thought profoundly about the relationship between

'Atom' and 'Self', that is the inter-relationships between the external universe and the internal universe, the mind-body interaction, or, more broadly, the inter-relationship between science and spirituality. He not only loved to meet colleagues and exchange thoughts with them, but he also spoke and wrote copiously about these basic philosophical questions.

The end came peacefully in his sleep in the early hours of the fourth of February 1993 at Jaipur.

REFERENCES

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