

## Digvijai Singh (1934–2018)

Professor Digvijai Singh (DVS) passed away on Friday, 20 July 2018 in New Delhi. DVS was born on 11 December 1934. He obtained his basic science degree from Allahabad University, degrees in Mechanical Engineering and Civil Engineering from the University of Roorkee and M S and Ph D, from University of Wisconsin, USA. He taught at the University of Roorkee from 1958 and served the University as Professor and Dean till 1990. He was also Director, Central Road Research Institute. He has published 160 research papers, guided 19 Ph Ds and several M E theses. Areas of his specialization are Dynamics of Mechanical Systems, Tribology, Stress Analysis, Fluid Mechanics and Road Transportation Engineering. He has made outstanding contributions on dynamic stability of two-wheeled vehicles and has carried out analytical work on hydrodynamic and hydrostatic bearings and fluid seals, tyre mechanics, design of micro hydro-machines and modelling of welding arc and its stability. He led the enormously successful Fly Ash Mission Project of the Department of Science and Technology (DST), which has contributed to its utilization, safe disposal and management.

In 1978, DVS won the most coveted Shanti Swarup Bhatnagar Prize. The world of science acknowledged with acclamation his original thinking in the field of Dynamics of Mechanical Systems and Tribology. He later went on to serve the Tribology Society of India as its President. Thereafter, he was honoured with the Lifetime Contribution Award of the Indian National Academy of Engineering in 2015. At every juncture of his journey of life, in the relentless pursuit of higher goals, rewards and awards followed him like his shadow. The Life Time Achievement Award of the Tribology Society of India, The Lifetime Achievement Award of the International Society of Production Engineers, USA, the Distinguished Alumnus Award of the IIT Roorkee, the National Design Award of IE (I), the IMDA Silver Jubilee Award and the Khosla Awards are only just a few of the other awards bestowed on him from time to time. The three science academies of India and the Indian National Academy of Engineering honoured him with Fellowships. Inter-

alia, he also served as the Vice President of the Indian National Academy of Engineering and of the Indian National Science Academy.

He has served on many Committees. Among them are Science and Engineering Council of DST, Programme Advisory Committee of Civil and Mechanical Engineering (Chairman), PAC of Manufacturing Technology, TIFAC-CAR Programme Committee and its Panel on IC Engines and Drive Trains (Chairman), Fly Ash Mission of DST (Lead Person),



INAE Forum of Technical Education (Chairman), Research Council of CSIR-CRRI (Chairman), National Board of Accreditation, Board of Governors of the Engineering Council of India, Board of Governors, IIT Kanpur, etc. He has also served on the DST Technology System Development Group (Chairman) and DST-PAC of International Programme (Engineering and Material Science). He was the National Coordinator (Engineering Science) Indo-Russian Integrated Long Term Programme of Cooperation in Science & Technology, Chairman of the CSIR Engineering Cluster and Chairman NRDC Award Committee. He also served as Member, Indian National Academy of Engineering Council, and was Chief Editor of *National Academy of Sciences Letters*. He was Chairman of the Research Council of CSIR-CMERI.

In addition to the above, DVS served with distinction a number of institutions and professional bodies. He was the Director of CSIR-Central Road Research Institute, New Delhi during 1990–1996;

Vice Chairman, AICTE during 1996–2000; Vice Chancellor, University of Roorkee and Director IIT Roorkee during 2000–2002.

Rarely have I come across people who are attributed with the expression of the altruistic gene, which induces large heart, sharp intellect and wide vision. In DVS, I found such a man. To all those who knew him, his identity was of an unassuming person of simple living and high thinking. Now when he has gone leaving his footprints on the sands of time, it is our turn to bow to his qualities of head and heart and pay our debt of gratitude that he so richly deserves.

DVS and I first met within a couple of weeks of my joining Central Building Research Institute, Roorkee in 1975. My intimacy with him, however, grew after I became the Director of CBRI in 1986. The bond between us became stronger as the years and decades rolled by and would remain as strong even after his departure.

Down the memory lane, I recall several anecdotes frozen in time and space. On 12 February 1990, I got a formal letter from Prof. A. P. Mitra, the then Director General of CSIR, conveying to me the approval of the Prime Minister of India to my appointment as Director, Central Road Research Institute. Having already given my consent to join the United Nations Centre for Human Settlements in Nairobi, I expressed my inability to accept the offer, Mitra was not disturbed in the least. He paused for a couple of minutes and then picked the directory of INSA resting on his table, ruffled its pages and asked me whether I knew DVS. I nodded in affirmation. It appeared to me that he was already convinced of the exceptional merit of DVS as a pick for the post of Director, CRRI. Mitra knew all about his work on dynamics of single track vehicles and fluid film lubrication studies. He also knew about his degrees of Mechanical Engineering and Civil Engineering from University of Roorkee. Subsequent conversation with me was merely to find out more about my view of the connection between DVS's field of expertise and the challenges he would face, if selected to lead CRRI. Mitra also wanted to know how similar institutions in the United Kingdom and other parts of the world are run.

Well connected with CIB at that time, I cited the example of the Building Research Institute at Garston in the UK which was led by a physicist. I could see a smile on the face of Mitra as I left his room. DVS was not only destined to become CRRI Director, but to take it to taller heights! He made such a dent in the field of highway engineering that he was called upon to serve on the Board of Governors of International Road Federation, Washington, DC, three Committees of the World Road Association (Paris), Board of Governors of the International Federation of Science, Stockholm, and was also the Secretary of the Federation of the Asian Scientific Academies and Societies.

In the last one decade or so, for every professional discourse, we frequently interacted with each other. About five years ago, for almost about two years at a stretch, I used to share draft chapters of my book as it was being written. So thorough and intense was his review, and so perfect was his editing that the final chapters looked very different from what

I had originally written. My book had a large number of cartoons and illustrations. He was so concerned about the quality of my book that he, on his own, undertook to redraw some of the cartoons. It was only at that time, I came to know that he was an ace cartoonist too!

We worked together very closely on the projects of the INAE Forum on Engineering Interventions for Disaster Mitigation and he continued to be proactive throughout despite his steadily failing health in the last couple of years. The last of the INAE Forum meetings he had attended was on 27 June 2018, just three weeks prior to his death. So strong was his will, that the hardship of 2–3 hours of travel time from his residence in Vaishali to the INAE office in Gurgaon paled into insignificance, despite his failing health. He not only called me over the phone a day earlier to confirm his participation but to follow it up after the meeting with the written version of his statements made at the meeting, which are now part of the minutes. Imagine someone doing

all that brushing aside the irritating health related problems!

It will be unfortunate if his real identity and nameless acts of kindness and compassion were to get lost in the dazzle of the countless awards and rewards that knocked his door one after the other. To me, above all, he was a thorough gentleman, a human being par excellence and a man of high values. According to E. M. Forster: 'Failure and success seem to have been allotted to men by their stars. But they retain the power of wriggling, of fighting with their stars and in the whole universe the only interesting movement is this wriggling.' Singh fought with his stars like a warrior until the very end. When history of contributions by outstanding Indian engineers is written, Singh will doubtless occupy a full page.

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