

D. D. Pant (1919–2008)

The organization of the 1989 National Symposium on Laser and Spectroscopy at the Banaras Hindu University (BHU), Varanasi coincided with 50 years of spectroscopy research in the university. Ten of the senior-most students of R. K. Asundi, who had helped him in making BHU internationally famous in the field of molecular spectroscopy, were honoured by the university on the occasion. D. D. Pant (then 70 years old) and P. Venkateswarlu were then the only two active scientists in research, with Venkateswarlu having set up the spectroscopy laboratory from scratch at Huntsville, USA after achieving the same feat at IIT Kanpur many years ago, and Pant having, at long last, acquired equipment for his picosecond experiments at Nainital. When Pant and Jagdeo Singh, students from the first batch of MSc Spectroscopy, met their former teacher Nand Lal Singh (then 85 years old, whom they affectionately called 'Master Saheb') on the occasion, emotions ran high with reminiscences of building the spectroscopy laboratory brick by brick.

Devi Dutt Pant, born in 1919 in the remote village of Deorari in the hill district of Pithoragarh now in Uttarakhand, preferred BHU over Allahabad University in 1940 for his postgraduate studies in physics because of his involvement in the freedom struggle. His love for Banaras was intense till the end; he did not believe in rituals, but he was highly spiritual and the Sankatmochan temple was his most preferred place after the BHU campus, perhaps because of its serenity. He would remember following the Hindi poet, Nirala on the road in front of the Birla and Broacha hostels, among a group of students who had great admiration for the famous poet in his torn kurta and carefree mood.

Pant was one of the favourite students of Asundi, who sent him to C. V. Raman for research soon after Pant completed his MSc in 1942. The main reason for keeping him away from Banaras was to protect his academic career from the repressive British Government, which came down heavily on the student community in Banaras after the Quit India Movement. Pant stayed in Bangalore till 1944 and carried out experiments on the photoconductivity of diamond and luminescence of uranyl salts. He earned the affection of

Raman because of his fearless and inquisitive temperament, and the latter showed him how to prepare one's eyes, by sitting in a fully darkened room long enough, to see light emanating from single photons.

Raman knew the difficult financial position of Pant and his family, his Gandhian ideals and his intention to be a teacher to serve the cause of nation-building. Since there was paucity of funds for research scholarships at Bangalore, Raman advised Pant to combine his research work along with a teaching job and helped him to get one in Agra. Pant started his teaching career as a lecturer in physics at Agra College in 1944, visiting BHU to carry out research work during vacations. He received his DSc from BHU in 1949 and



joined as a professor in physics at R.B.S. College, Agra, where he set up one of the finest teaching laboratories in physics. He joined the D.S.B. College, Nainital as Head of the physics department in 1952 and built a spectroscopy laboratory from scratch. He started experiments on detection of light emission from uranyl salts using a photomultiplier tube and a sensitive galvanometer procured from discarded military equipment of the Second World War. By the time Pant eventually stopped going to his laboratory due to ill health, it had become an internationally known centre for picosecond fluorescence decay measurements.

Molecular spectrum contains two vital pieces of information about the atomic or

molecular species: in the form of (a) wavelength and (b) intensity of the spectral line. Measurements of wavelengths provide valuable data about the energy levels, which can be translated into structure of the atom or the molecule. The measurements of intensities of spectral lines provide data on the lifetime of the excited energy states, which can be translated into the dynamics of the emitting species. There was great emphasis on the measurements of spectral wavelengths with higher and higher resolutions till 1950, and the three main Indian spectroscopy laboratories at Banaras, Visakhapatnam and Aligarh excelled in high-resolution spectroscopy research. It was perhaps the initial training under Raman that induced Pant to undertake the measurements of the decay of emission from optically excited molecules. He could easily measure lifetimes in the microsecond range with his home-built equipment at Nainital, and studied a large number of organic and inorganic molecules in solution phase, obtaining interesting effects of D₂O on the lifetime and the quantum yield. In the community of high-resolution Indian spectroscopists, perhaps Pant did not get the encouragement and appreciation that he deserved. I remember his lecture in a Physical Research Committee Meeting at BHU in 1963, which I, as a MSc student, did not understand much at that time. At the end of this talk, which obviously related to decay rate of luminescence, Asundi stood up and asked, 'Where is spectroscopy in this work?'. Pant tried to explain his point with utmost courtesy and respect for his teacher, but Asundi continued rebuking him to the embarrassment of all. It was Savadatti, who had recently returned from England after his research work in the laboratory of Porter, who mentioned something in support of the talk to end the discussion. Later in 1965 the research work at Nainital found extensive coverage in a book entitled *Spectroscopy and Photochemistry of Uranyl Compounds* by Belford and Rabinowitch.

As a Fulbright scholar during 1960–61, Pant chose to work at Florida State University with Michael Kasha, the 'Renaissance man', who discovered that phosphorescence emanated from the triplet states in organic molecules. During his stay in the US, Pant visited many im-

portant spectroscopy laboratories in North America, including NRC at Ottawa, the Mecca of high-resolution spectroscopy in those days. At the 1982 Gordon Conference on Molecular Electronic Spectroscopy at the Brewster Academy, I noticed a great deal of similarity between Pant and Kasha and the two discussed problems of nonradiative transitions and energy transfer in molecules at great length. The advent of short-pulse lasers had made the field of lifetime measurements and time-resolved spectroscopy fashionable in India by this time, but Pant had not found it easy to get research funding for the state-of-the-art equipment for his laboratory.

Pant was a great admirer of Asundi and Raman. He played a key role in the formation of the 'Laser and Spectroscopy Society of India' in 1981, as the new avatar of 'Convention of Spectroscopists' an unregistered academic body initiated by Asundi. He also encouraged his student D. P. Khandelwal to start the 'Indian Association of Physics Teachers' to strengthen and popularize physics education right from the school level. The cause of physics teaching was very dear to him. When the matter of making cheap helium–neon lasers available for schools was raised by a relatively junior spectroscopist at a Conference in IIT Kanpur in mid 1980s, most of the senior members on the panel were annoyed. Pant was the only person who stood up in favour of He–Ne laser

and emphasized that quality research in experimental spectroscopy could not be carried out without modernizing our teaching laboratories. He was straightforward and never hesitated in putting forth his honest points of view in any forum. He did not like indiscriminate import of equipment and took great pains to check the performance of those he purchased for use in his own laboratory. He even published the data obtained from his laboratory to challenge the claims that the manufactures made about the performance of their instruments.

Pant was the principal of D.S.B. College, Nainital from 1962 to 1971; Director of Education, Uttar Pradesh during 1971–72; Dean, Faculty of Science, University of Agriculture and Technology, Pantnagar during 1972–73 and founder Vice-Chancellor of Kumaun University from 1973 to 1977. He preferred to resign from the posts of Director of Education and Vice-Chancellor rather than yielding to pressure and compromising with his principles. The burden of administrative work never made him lose contact with his laboratory and research students. He remained an Emeritus Professor from 1978 onwards, not only in name, but with his physical presence in the laboratory till he became bed-ridden due to ill health. I remember spending a week in the mid 1990s in his laboratory, and it was great pleasure to walk with Pant from his residence to the laboratory

along the mountain path which Pant could negotiate more comfortably than I, 25 years younger than him. He always talked of research problems in molecular spectroscopy and sometimes lamented about the degradation in the character of science managers in our country. He did not give importance to money and lived a simple life. He focused on research and teaching under adverse circumstances. He was kind to younger scientists and met people with a smile.

Pant was an extremely modest individual and never exhibited his scholarship. He was a Fellow of the Indian Academy of Sciences, Bangalore; Sigma Si, USA, and Laser and Spectroscopy Society of India. He was honoured on several occasions for his contributions to the cause of education and public welfare. He was recipient of Raman Centenary Award as well as Asundi Centenary Award. With his passing away on 11 June 2008 in Haldwani, the Indian spectroscopy community has lost one of its most respected members. He was a symbol of courage and hope in the most adverse conditions. Pant has left behind a large group of students who will carry on his legacy into the future.

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