

In memoriam

Roddam Narasimha 1933-2020

PROFESSOR Roddam Narasimha (hereafter RN), one of India's leading scientists, researcher and teacher passed away in Bangalore on 14 December 2020 at the age of 87. Having obtained a basic degree in mechanical engineering from UVCE, Bangalore he graduated with a Masters from the Department of Aeronautical Engineering, Indian Institute of Science (IISc) in Bangalore. At IISc he was mentored by Professor Satish Dhawan, one of the founders of the indigenous Indian space programme and Director of IISc for over 20 years. RN went on to do his PhD under Hans Liepmann, who had also supervised Prof Dhawan, from the prestigious California Institute of Technology (Caltech), in the USA.

RN belonged to that generation of Indian students who pursued higher studies in Europe or the USA and then returned to nourish and build research traditions and capacities in the just turned independent nation, with an insistence on excellence and quality. He was to become Professor at IISc in the now renamed Department of Aerospace Engineering over a near four-decade period. He also served as Director of the

CSIR's National Aerospace Laboratory (NAL), Bangalore, was closely associated with the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) for 14 years and was also Director, National Institute of Advanced Studies (NIAS), Bangalore. Throughout he maintained a close relationship with IISc. Over the years he received several prestigious awards, including being elected Fellow of the Royal Society.

RN made fundamental contributions to a number of areas in fluid mechanics, especially in the study of turbulence, the application of parallel computing to problems in fluid dynamics, and finally modelling of the monsoon. In a landmark paper published on the vibration of an elastic string, RN derived an equation that has since been named after him. RN took on the challenging task of building scientific institutions in sovereign India very seriously, inspiring students to work on new scientific problems, building a tradition of scientific research while at the same time working on problems relevant to India's developmental needs. This he did as one involved both as an engineering scientist in India's aerospace industry and as a policymaker. At NAL he

participated in a number of projects such as the development of the indigenous Light Combat Aircraft (LCA), and initiated work on parallel computing for a number of applications.

Two months ago I received an email from RN that was the last I would receive, asking me about when a book a colleague and I had edited would be released. He had an article in this forthcoming volume on German engineering science and its extended genealogy, and its links with Caltech and the India Institute of Science, Bangalore. Like some of the leading scientists of that generation their commitment and work in science in no way exhausted their contributions or personality. He was a scientist well informed about the history of his own discipline, the sciences of the West and India and made salient contributions to these interdisciplinary fields. In the coming days and weeks many scientists will turn back and reflect upon and commemorate his contribution to the engineering sciences and the fields of investigation and research programmes that germinated from these contributions. The Indian Space Research Organization (ISRO) and the aerospace industry, particularly the public sector Hindustan Aeronautics Limited, benefitted immensely from RN's work and that of his colleagues and collaborators.

In what follows I shall not discuss his scientific and technological work for the obituaries by his colleagues and students have addressed them with competence, accuracy and a deep fondness. In the years when I met him frequently there was another side of his immense learning that I encountered and about which I shall present a few reminiscences. This was in the late 1980s and early 1990s when I was working with the history and philosophy of science research programme at NISTADS and had just published my first papers in the philosophy of science and the history of science. Amongst other things I was curious about documenting the vocation of research programmes that commenced at the so-called periphery of the sciences and acquired global visibility. I had come to know of the long commitment of RN's research group to understanding the 'onset of turbulence' and the turn this research programme had taken in RN's own research. And so I decided to study the programme just mentioned and was affiliated with RN's group at NAL where he was the Director even while he remained a professor at the Institute of Science. It was agreed that we would meet at his office, not at NAL, at the Centre for Atmospheric and Ocean Sciences at the Indian Institute of Science that was then located in the building of the Centre for Ecological Studies.

Late on Saturday afternoons after he had met his PhD students and collaborators I would get some time with him. I couldn't complain for being the last because the discussions were never hurried since nobody was waiting to meet him after me. My queries invariably began with the early attempts of the research group to understand the onset of turbulence and then extended to his and his students' research on the phenomenon of relaminarization of turbulent flows – an interesting problem in fluid mechanics with applications in the aeronautical industry as well. I was attempting to trace how this research programme evolved over the next decades and the new areas of research that branched out of the same.

While I collected and read papers published by the group I was constantly talking to two former doctoral students, G.S. Bhat and Sudarsh Kailas. The Saturday meetings gradually became occasions to discuss other matters I was researching at the time with my colleague S. Irfan Habib in Delhi and RN took time to comment on some of the drafts I presented him with interest. It didn't take long to encounter not just the wide breadth of his interests but of his reading on the history of sciences and the history of mathematics. Larger questions on the history and philosophy of science often came up for discussion – and though we agreed upon much, there were many issues about which we thought differently, given the distinct different disciplinary frames we employed to approach the object of discussion – but these differences never came in the way of the interesting and edifying conversations that followed. Though my reading at the time extended beyond the purely internal accounts of the history of sciences and technology, I learned a great deal from his close and nuanced internal accounts of technology at every meeting during those years.

It was around this time that he asked me to look into the life of Mokshagundam Visvesvaraya, the grand old man of Mysore and engineer whose life fascinated RN – not just for the engineering but the larger social context within which the former lived and about which he himself knew a great deal. And here RN was proactive in helping me meet some of the people who were aware of the socio-economic and cultural life of Mysore in the 1930s. So one day we went off to meet the literary icon of old Mysore, Nittur Srinivas Rao, who was then possibly in his late 90s and after having introduced me RN left me to pursue my interviews with him. He promoted a number of such efforts that were collated in a volume he edited entitled *Dialogues across Disciplines*.

After I returned to my institute in Delhi and our meetings naturally became less frequent, the exchanges continued over email. What continued to intrigue me, as Peter Galison has pointed out in other contexts, was how the empirical, theoretical, matters of instrumentation and personal orientations and resources were so entangled in steering the trajectory of scientific research programmes. For example, how did the interests in relaminarization and the experimental issues that needed to be sorted out in that domain lead up to the Monsoon Boundary Layer Experiments. And how did these interests dovetail with that of other colleagues leading up to the formation of the Centre for Atmospheric Sciences. RN with his colleagues played a role in the creation of the Centre and much later he was responsible for impressing upon the government the need to create a Ministry of Earth Sciences.

During our conversation on the history of sciences, it became evident that P.C. Ray's *History of Hindu Chemistry* had left a deep impression and he often wondered how much more had been said on the matter since the publication of Debiprasad Chattopadhyaya's *Lokayata* that had marked a milestone inasmuch as it highlighted the origins of materialist thought in India. RN may have been wary of Debiprasad's Marxist account of the history of scientific thought in India, but he did play a role in instituting an award for Debiprasad Chattopadhyaya in recognition of his work, probably a year before the latter passed away.

I next had the chance to work with RN when he chaired INSA's National Commission for History of Science. The Commission was till then comprised largely by scientists and historians of science. RN made it a point to bring in historians as well. One of the issues that came up for discussion over the years was the historiographical distance that had come to separate the scientist's history of science from the professional or disciplinary history of science, which was beginning to have a deleterious effect on the discipline in India. RN took cognizance of the problem that was difficult to resolve given the conceptual momentum and sociological segmentation of disciplinary movements, but in his patient and considered way he carried the different views of the Commission.

As mentioned earlier, we had different ways of looking at questions on the history and philosophy of science. His generation of scientists, who were students in the late 1940s and 50s, was schooled in Butterfield's and Koyre's historiography of the 17th century Scientific Revolution and as a result were drawn to responding to the Needham question in non-European contexts.

Those who entered the field in the 1980s were schooled in the idea that the big picture of the 17th century scientific revolution needed to be decentred. I read the drafts and commented on papers RN published in his attempt to answer the Indian half of the Needham question.

The essays in a book a colleague and I edited to commemorate Needham's historiography following his demise in 1995 did not stray down the line of Needham's question, but disputed with Needham's ideas and how to work towards a genuinely global history of science in our own times. RN's classic paper on Tipu's rockets was well within this transcultural problematic. When it was first published it was framed by the idea of a neglected episode on the history of technology – of presenting a seemingly unrelated object in a new context of technological evolution. The paper when read through the lens of contemporary concerns of historians of science and technology is about the transcultural circulation of ideas and technological objects and the improvisation and redefinition they undergo in the process of circulation. There is much in the latter part of the paper, which should be material for historians of science and technology to look into. Hence its salience.

RN was deeply committed to thinking about history in the civilizational paradigm. And here too trends in disciplinary history had moved away and historians looked skeptically on the concept of civilization – both historians and scientists are well aware that concepts and theories have half-lives. Sanjay Subrahmanyam and Romila Thapar had urged scholars to rethink their civilizational histories and categories. The concept was seen by historians to embrace far too much diversity spread over vast geographical expanses and durations of time into a unitary whole. But RN's characterization of the Indian exact sciences as premised on computational positivism will stand the test of time in perhaps marking one important phase in the history of the exact sciences in the South Asian region.

Over the last two decades I never missed the opportunity to meet him on my visits to Bangalore. Agreement during the conversations that followed was always accompanied by a charming smile and a triumphant exclamation: 'That is correct', as if something had been achieved. But when we failed, there was a sigh and a long drawn out 'Welllll?' and the conversation continued for that became an opportunity for more thinking and engagement. This attitude of constant intellectual engagement and an enviable enthusiasm of inhabiting the world of ideas made of him the exemplary academic. And that RN indeed exemplified this ideal is evident in his standing that extended beyond discipli-

nary boundaries. Many of us outside the world of science, or studying social and cultural aspects of science, will certainly miss his farsighted encouragement of the need for dialoguing across disciplines in an academy splintered into three cultures.

Dhruv Raina

Professor, School of Social Sciences, JNU, Delhi

Sunil Kothari 1933-2020

SINCE the eminent dance critic and scholar Dr Sunil Kothari succumbed to Covid on December 27, there has been a remarkable outpouring of affection and admiration for him. Dancers in particular but also dance writer colleagues and friends from all over the world have written eulogistic obituaries that recount treasured memories of his friendship and, most of all, of his encouragement and support of them and their work.

Yet, gregarious as he was, flitting around the world to attend dance performances, conferences and other events, he rarely spoke much about himself, his family, his childhood, and even less about the struggles and difficulties that only his bosom friends were privy to. Few knew he was the youngest of 10 siblings, though he did admit, intriguingly, in a video interview that, as the four year-old son of Dahiben and Manilal Kothari of the Kheda district in Gujarat, he never even knew his three sisters.

Most people know of him from his heyday as dance critic for the *Times of India* and author of at least ten books on various forms of Indian dance. Since books on dance are heavily illustrated, too many people

regard them as ‘coffee-table books’, a pejorative term that belies how well researched they were. I often use them as reference books when reviewing performances or writing and lecturing on Indian dance.

Having delved into the information available on-line about him, I find it curious how little one learns about his early days. Stellar Kathak dancer and fellow Gujarati, Aditi Mangaldas, recently remarked on her own shortcoming in never asking him about *himself*. Most dancers, people he loved, watched and befriended, related to him as ‘the critic’, for he usually approached them about *their* work. Only *after* his leaving us have there been anecdotes about *him*.

I first met him in New Delhi in 1961 as friend of painter Amrita Sher-Gil’s sister, who married India’s second Chief Election Commissioner, the Sanskrit scholar K.V.K. Sundaram. Sunil had jumped the gate of 5 Race Course Road late at night, thrown pebbles at the window of the room I was sharing with their daughter Navina and, instead of going to see his *saheli* Mrs Sundaram, stopped to chat with us, regaling us with anecdotes that had us giggling late into the night.

Over the years our friendship blossomed, and I enjoyed many an inspired evening with him at a dance or theatre performance in New Delhi, in Chennai, in New York. We usually sat together; whoever arrived first saved the adjoining seat for the other. Sometimes he would murmur amusing comments into my ear, making me chuckle. More often we shared our rapture over a particularly splendid performance. The last time was during the Madras Music Academy Festival barely a year ago. Registering our delight with Odissi dancer Bijayini Satpathy’s performance, we both spontaneously stood up to applaud her.



Dr. Sunil Kothari with Rajika Puri prior to Opening of Madras Dance and Music Festival 2019.



Dr. Sunil Kothari family photo – with his siblings and their progeny circa 1950.