K. Subrahmanyam (1929–2011)

It is not often that a science journal carries obituaries of people who are not card-carrying members of its constituency. K. Subrahmanyam, who passed away in New Delhi on 2 February 2011, should be a notable exception. Even though he graduated from Madras University with a first class Honours in Chemistry, Subrahmanyam like many ambitious South Indian brahmins of that period, gave up further studies in science to choose the coveted Indian Administrative Service (IAS) for a career. It was this exposure, he later claimed, that taught him the tricks of the trade for pushing one's ideas through the labyrinths of bureaucracy and politics.

Even as a university student, Subrahmanyam was interested in military affairs and was also an NCC cadet. If only his eyesight had permitted, he would have chosen defence services over his IAS for a career. Instead, he chose to pursue India's strategic options and policies. The world of those decades was a polarized one. The Cold War was at its worst freeze with scientists persuaded to develop and help deploy bigger and bigger weapons of mass destruction. It seemed at that time that India's policy of non-alignment without nuclear weapons would not survive the politics of the weapon-cluttered world that was prone to misunderstandings and security threats. Subrahmanyam saw the need for detailed academic and policy studies that would enable India not only to understand where other countries were coming from, but also develop its own strategies that were armoured to stand against the Cold War. It was this vision that enabled him to join the Institute of Defence Studies and Analysis (IDSA), and in seven years he built the Institute into a formidable 'think tank' comparable to some of the best in the West. His talent was to identify strategic issues that he considered important and were also of to interest others. He was a master in harnessing the power of shared concerns.

It was during this tenure, that Subrahmanyam saw the importance of science and technology in shaping defence policy and became a proponent of science for defence. He became an indefatigable champion of nuclear power for the nation's security and economic growth. He made friends with senior scientists in the Atomic Energy Establishment. He argued that India could not afford to ignore nuclear weapons options. He spoke forcefully of this conviction, much against the received wisdom of that period. Subsequent events were to prove him right, even though at that time he was often reviled as Dr Strangelove, a bomb-loving character in Stanley

Kubricks's black comedy of that period. He used to recount how in the late 1970s as a bureaucrat, working along with the Cabinet Secretary of that time, he was able to persuade the Prime Minister and Foreign Minister against India signing the Nuclear Non-Proliferation Treaty. India has continued to hold on to this decision sustained by Subrahmanyam's convincing arguments that the treaty was inherently flawed and discriminatory. After many years of denying the nuclear weapons options, India has also chosen to develop and test these weapons. Subrahmanyam felt he was vindicated.

Defence Research and Development Organisation (DRDO) was his next focus. Subrahmanyam was concerned about the absence of indigenous R&D for developing major military systems. In a public lecture delivered at the 1996 Annual Meeting of the Indian Academy of Sciences in Jodhpur, he lamented about the lack of appreciation by the political leadership on the importance of indigenous R&D for national security (*Curr. Sci.*, 1997, **12**, 551–555). He spoke of technology being more important than even military hardware in the unpredictable security environment India faced. Earlier, he worked with C. Subramaniam, then a Cabinet Minister, in developing an Aeronautics Policy for the country that envisaged India building its own indigenous fighters. Just a week before his passing away, Subrahmanyam was pleased to hear that the indigenous supersonic fighter *Tejas* was getting inducted into the Indian Air Force.

I came to know him closely from 1982 when I was appointed as Scientific Advisor to the Defence Minister. He was also back at his favourite haunt, IDSA. He was helped into that position by Raja Ramanna interceding on his behalf with Indira Gandhi, who wanted him out of Defence and the Government. She, along with a few other politicians and senior bureaucrats, was uncomfortable with Subrahmanyam's views and writings on India's security issues and strategic concerns that were not toeing the Government line. But his friends and admirers in the echelons of power ensured that no harm came his way. In those years he would visit me often to be briefed on the large weapons' development programmes that were then beginning in DRDO laboratories. Most of these long-term programmes have now come into fruition with all these systems entering service. When there were criticisms about DRDO embarking on too many sophisticated projects without adequate incubation, Subrahmanyam interceded on DRDO's behalf at Defence Services meetings and conferences, explaining how the projects we had chosen were relevant and necessary.

But his greatest contribution was in helping to draw a national road-map for the development and deployment of strategic systems and plans. Subrahmanyam was an active member of this group and helped to draw a plan for the Government's consideration. This report was well received by the then Prime Minister and also by his successor, who specially complimented Subrahmanyam for the diligent work that helped shape the country's strategic policies. He argued that deployment called for careful planning with robust and fail-safe command and control systems that were well rehearsed

by people in positions of authority. He tried to develop a quantitative game theoretic model for exercising strategic options, but in the end chose an intuitive one that was as persuasive as the more mathematical models of the West based on mutually assured destruction and 'unacceptable damage'. These studies led him to the doctrine of No First Use that India has adopted. Many years later in 1999, he would once again head a similar committee, this time to review the Kargil war on the mountains of Jammu and Kashmir, and recommend the steps necessary to prevent similar surprises in future.

Subrahmanyam was a ceaseless writer and as a newspaper contributing editor wrote his pieces suffused with one argument or another related to defence and security. His lectures were also focused and carefully planned. He was for a short time a colleague of mine as a Distinguished Visiting Fellow at Carnegie Mellon University, USA, and converted many of my American colleagues, who were somewhat tentative when it came to Indian policies, into Indophiles!

Subrahmanyam could be outspoken and forceful in presenting his views and sharp with his criticisms. But outside conference halls he did not harbour any ill-will or rancor with his critics and was friendly with all. He was a true democrat and did not compromise on his persuasion even during the Emergency years. Then, working as a Governor's advisor in Tamil Nadu, he tried to save young activists fighting against the emergency from incarceration.

He lived modestly as a middle-class professional with his wife Sulochana, a doctorate in music from Delhi University, and was not persuaded by the opulence that comes with impressive professional success. He was a connoisseur of Karnatak music and often exchanged notes with me on what he thought of the emerging musicians from the South. He is survived by three sons and a daughter.

For the past few years Subrahmanyam was suffering from a rare form of cancer and other ailments that would have cramped the life of any normal person, but not him. He continued his writings and long conversations with his many colleagues and admirers as before. Just a few weeks ago he wrote a long piece on 'Challenges of the 21st Century' (http://www.cstep.in/node/234), that ended up as his last major published article.

Subrahmanyam has left an indelible mark on India's defence strategies and security policies. As one of his admirers put it, 'we all thought he was immortal and was always available with sagacious advice'.

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