

Praveen Bose | Bangalore November 30, 2013 Last Updated at 21:46 IST

We need to have an instinct for self-preservation: C N R Rao

Interview with Bharat Ratna Awardee



The effervescent **Chintamani Nagesa Ramachandra Rao** or **C N R Rao**, as he is better known, who was conferred the Bharat Ratna recently, is a father figure and friend to the scientists and scholars under him. The 79-year-old, who has been a professor for 54 years, lives and breathes science. When he isn't researching at the Jawaharlal Nehru Centre for Scientific and Advanced Research (JNCASAR) in north Bangalore, Rao is either reading or writing letters to the prime minister to revive pure sciences. Despite Rao's tight schedule, *Praveen Bose* managed to pin him down for a chat. Edited

excerpts:

How has the Bharat Ratna award changed your life?

It doesn't change my status. I am not overexcited. It doesn't mean anything. I still remain a scientist. I did not need this. I have been advising prime ministers for decades.

I have known the current prime minister for nine years and I am grateful for that. I have been working for India for 30-40 years and will continue to do the same.

Do you think you could use this status to influence industry to spend more on research?

I hope the industry will listen to me. I feel the Indian industry should contribute to help the government towards scientific research. The government alone can't do it. As of now, there's nothing. I have been into research for about 40 years. In the US, 50 to 60 per cent of the research and development (R&D) cost would be covered by the industry. There is a need for the same here and the industry needs to do it. Earlier, the industry in India didn't feel the need to do research. They could sell anything. Now, it wants to compete with the likes of South Korea and Japan, but they can't. We need to change this or the industry can't compete. From Rajiv (Gandhi)'s times I have been a member of many advisory committees.

What would be your dream institution?

Of the best institutions I have known, Harvard and Stanford stand out. My ambition is to see a Stanford or a Harvard here in India. Once, I had suggested that if someone was ready to invest \$4-5 billion for four to five years, we could build institutions like Harvard or Stanford in India. We have the money. We have to do something in education at such a level that a lot of our talent would want to come here. We do have outstanding institutions here. We need institutions such as JNCASR or Indian Institute of Science (IISc) that would be as good as the rest in the world. As of now, we can only take as many people as there are institutions. Like China, we also need to build institutions that do wonderful research. Bangalore has 65 engineering colleges in the private sector... some of them are good. A majority of them are so-so. We need to be highly ambitious in this regard. A lot has to improve.

Can private institutions and universities founded in the last few years do justice to research? What's

wrong in working with government institutions?

Private universities are only looking at money. Those looking at research are only the ones established by the government. Among the newer institutions, Indian Institute of Science Education & Research is doing good work. The government has bureaucracy. So, the institutions can't have a curriculum as they want. Also, they have no financial control. Hence, I prefer private institutions. Even the public-private partnership model in education has not been successful. There's not much freedom there too. Who controls what, is difficult to say. Politicians enter syndicates and vitiate the atmosphere. We want purely academic people working there.

Do you get time to relax when there's so much for you to do?

(Points to a music system behind him) This is the best way for me to relax. Music for me is therapeutic. My door is closed from 12.45 to 1.30 p m, when I am listening to music and having my lunch. I have buttermilk and boiled beans *(laughs)*. You can't survive on this quantity.

I listen mostly to Sanskrit *shlokas*, the Devaranama and Hindustani classical, and artistes such as Bhimsen Joshi, Amjad Ali Khan, Hariprasad Chaurasia, Vilayat Khan, Pandit Ravi Shankar. I listen to them not out of religious fervour, but because it helps me relax, and I also know quite a bit of Sanskrit. My work starts at 8 a m and I finish only by 4 pm. Even today, I wake up at 4.30 a m.

Do you read anything other than scientific materials?

I read fiction to relax. I have read the Century Trilogy - "Fall of Giants", "Winter of the World" and "Edge of Eternity" - by Ken Follet. I am currently reading the Millennium trilogy written by the late Stieg Larsson. Only by reading such books can you remain human after spending all those hours in the lab.

What do you think about the current situation in the country?

There's a terrible atmosphere prevailing in the country today. Look at the front pages of newspapers or watch any news channel... it's only negative news. Everybody has to become positive. Let us do something to make ourselves proud. The society has a major role to play. That is what makes China proud.

I have taught at Indian Institute of Technology, Kanpur. There were a lot of brilliant minds. Even if one-third of them had worked for India, things would have been different. Only in the last three to four years have things begun to look up. We need to welcome people to innovate. India needs to become a powerful nation.

What do you think about the institutions in the country today and the quality of manpower?

India has no high-quality institutions. Many of our scholars are going abroad. If they all returned, then there would be no place to absorb them. Look at South Korea: In a time span of 10 to 15 years, they have built so many educational institutions, and people came back.

The amount of money going into research in India is less. Only 1-1.8 per cent of the gross domestic product (GDP). South Korea invests 3-3.5 per cent of its GDP in R&D.

Also, we need to give importance to value systems to promote innovation. We need to develop an ecosystem of innovation and technology will arrive soon. Of the 140 nations rated for innovation, India stood at a lowly 66. We need new ways of doing things and new ways of thinking. We cannot be doing the same things. Jugaad (a temporary solution) is one of them. The atmosphere itself should encourage innovation.

What should be the government's priority today?

We need science, technology and innovation. I call it STI. We have to do better in innovation. The government will have to support STI. The future of business will depend on innovation.

What do you believe should be the chief focus areas for research?

We must have an instinct for self-preservation. Take the problem in Bangalore, and extrapolate it to the whole country. Just imagine the shortage of water and electricity. It is mind-boggling. Water management needs serious consideration. How well we manage water will decide our future. We need much more research in energy. We also need good systems and policies. We should test the frontiers of research. For instance, take water and decompose it into oxygen and hydrogen. The hydrogen can then be used to produce energy. We are working on artificial photosynthesis (the process by which plants use sunlight to synthesise nutrients from carbon dioxide and water), and disease biology.