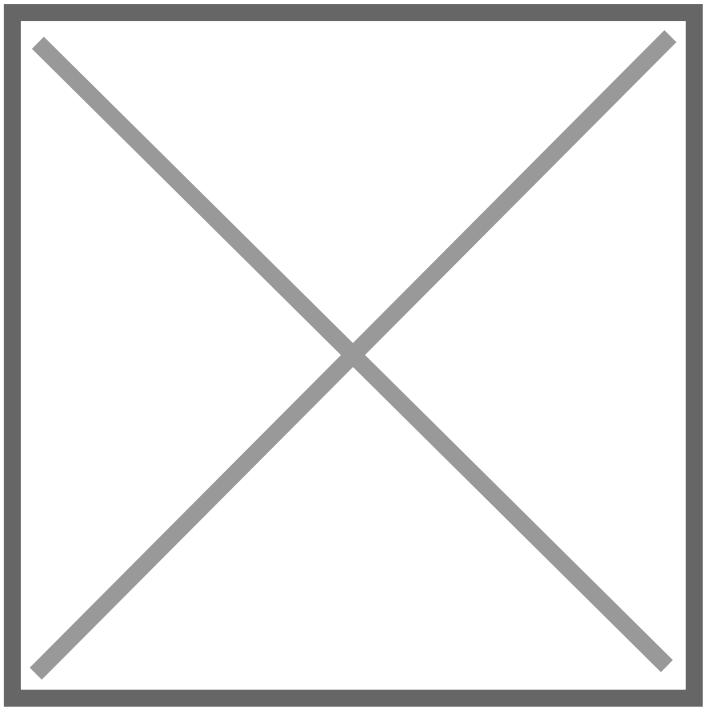
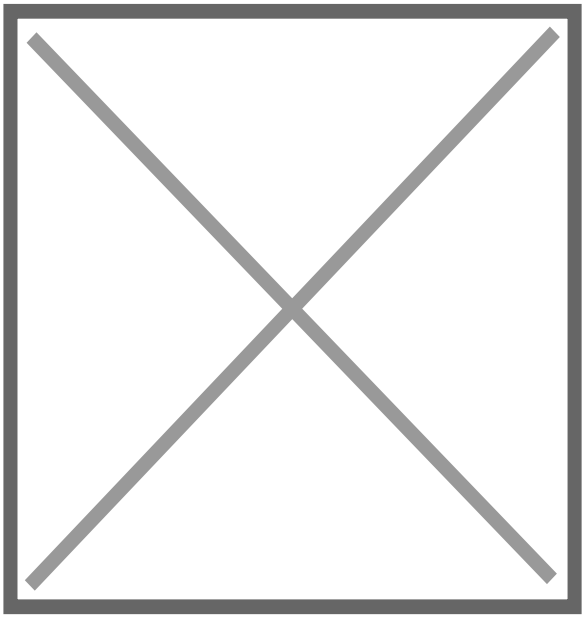
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An Optimist and a Visionary

14 December 2006 | News



An Optimist and a Visionary



As the first "super star" of Indian science, Dr R A Mashelkar, has played a role much larger than the head of the massive CSIR network of laboratories. The biotech task force headed by him has charted out the course for a modern, efficient regulatory framework for biotechnology. And the dozen other high power committees headed by him in the last 15 years have propelled the country's amazing progress in different areas of high technology. An unabashed champion of liberalization and intellectual property rights(IPR), so crucial to the life sciences sector, this unassuming chemical engineer has left ever-lasting imprints in Indian biotechnology sector rapid progress to global glory by nudging, advising and of course clearing the various hurdles in its onward march. No wonder he was the unanimous choice of the BioSpectrum Jury for the Life Time Achievement Award as he hangs up his public administrator's role and takes up a mentor's role to inspire another generation of Indians.

Dubbed as a 'dangerous optimist', Dr Raghunath Anant Mashelkar, Director General, CSIR, has the reputation of being someone who always sees the half full part of the glass and not the half empty. This attitude has been the key behind the

saga of this extraordinary man who began his life in poverty, sometimes hungry and shoeless, but rose to become the Director General of the world's largest chain of publicly funded industrial research and development; the CSIR (Council of Scientific and Industrial Research) and the president of the Indian National Science Academy (INSA), which is the number one position for a scientist in the country.

Humble beginnings

Born in place called Mashel in Goa, he was the only child to his parents. Bereaved of his father at the tender age of six, young Mashelkar along with his mother came to Mumbai in search of a livelihood. "It was a tough childhood. I walked barefoot until I was twelve; studied under streetlights; getting two square meals a day was a problem," he recalled. In spite of all the hardships, he excelled in studies and made it a habit to top all through his academic career. "My mother did odd jobs, like stitching, to bring me up and to make sure that I got educated. The only way I could study was through scholarships, so standing first in the class became a necessity. What kept me going, however, was my mother's determination that I must study and achieve the greatest heights possible".

His interest towards science was kindled early in life by his physics professor. "One day Principal Bhave, who taught us physics, took us outside the classroom to demonstrate how to find the focal length of a convex lens. He focused the sun's rays onto a piece of paper and told us that the distance between the paper and the lens was the focal length. Then he held the lens in place until the paper burned. That's when he turned towards me and said, 'Mashelkar, if you can focus your energies like this and not diffuse them, you can burn anything in the world!' I decided at that moment to become a scientist", shared the CSIR chief.

Academic forays

After earning a bachelor's degree in chemical engineering from Bombay University in 1966, Mashelkar pursued his studies towards a PhD at the University. He did post doctoral research at the University of Salford, UK, held a faculty position there and then had a brief stint in the US as a visiting professor. But in the mid 1970s, when attractive offers came his way for the faculty positions in top schools in the US and UK, he decided to return to India.

In fact, the story of his return to India was very interesting. The late Dr Nayaduma, DG, CSIR during the mid Seventies, had gone to London to prospect bright Indian scientists working overseas at the behest of Mrs Indira Gandhi, the then Prime Minister of India. Mashelkar went to meet him at the Survey Hotel in London, spoke to him for about half hour and was filled with the dream of a new India. He accepted the offer on the spot and told his wife in the evening, "The nation is calling us, let us go back." Thus, returned the prodigal son of India and joined the National Chemical Laboratory, Pune at a salary of Rs 2,100.

Bringing winds of change

This internationally acclaimed chemical engineer took over as the Director of National Chemical Laboratory (NCL) in 1989. At 46, he was the youngest Director to take over the charge of this premier research laboratory. Dr Mashelkar brought in new concepts in research and technology management and moved NCL on the path of being a global R&D platform by offering its technologies and services worldwide.

When Mashelkar took over as DG, CSIR, in 1995, he became the youngest Director General of CSIR at the age of 52. It was then that he single handedly revamped the organization and turned it into 'CSIR Inc': A public funded R&D institution with corporate style R&D and business plan. This initiative has transformed the organization into a user-focused, performance-driven and accountable organization. "We now have a very transparent and open working system. We see a new vibrant institution and more importantly, now CSIR has become Team CSIR: 38 labs working together," said the DG passionately.

He has also been instrumental in propagating a culture of innovation and balanced Intellectual Property Rights (IPR) regime for over a decade. It was through his visionary campaign that growing awareness of IPR has dawned on Indian academics, researches and corporates. He spearheaded the successful challenge to the US patent on the use of turmeric for wound healing and also the patent on Basmati rice. These landmark cases have set up new paradigms in the protection of India's traditional knowledge base, besides leading to the setting up of India's first Traditional Knowledge Digital Library. In turn, at an international level, this has led to the initiation of the change of the International Patent Classification System to give traditional knowledge its rightful place.

In post-liberalized India, Dr Mashelkar has played a critical role in shaping India's S&T policies. He was a member of the Scientific Advisory Council to the Prime Minister (1988-90) and also of the Scientific Advisory Committee to the Cabinet set up by successive governments.

His dedicated and through style of working has won him over 40 awards and honors both in India and abroad. He is one of the eight Indians who have been elected as fellows of the America's National Academy of Sciences since 1863; Third Indian Engineer to have been elected as a Fellow of the Royal Society (FRS) in the twentieth century. The President of India honored Dr Mashelkar with Padmashri (1991) and with Padmabhushan (2000), two of the highest civilian honors in recognition to his contribution to nation building. In 2005 he received the Business Week (USA) award of 'Star of Asia' at the hands of George Bush (Sr), the former President of USA. Business India named him as being among the 50 path breakers in the post Independent India.

Role models

On being asked about his mentors, he replied, "I do not have a single role model. There are attributes that I like in different individuals. And I have tried to learn and imbibe from them. For example, Prof CNR Rao is one of the greatest scientists that this country has produced. I like his enthusiasm for science. He not only loves science but he lives science. Even at the age of 73 he puts in 18 hours a day. I have tried to imbibe his spirit. I look at my guru Prof MM Sharma, under whom I did my PhD. His memory is phenomenal and so is his value system-absolutely impeccable. I look at Prof R Kumar of IISc, Bangalore. I have rarely seen a more innovative and creative individual with greater incisive sense of analysis." "I look at Dr Ashok Ganguly, who was with me a member of the Science Advisory Council to the Prime Minister during Rajiv Gandhi's time. I love his optimism. He always saw the brighter side of the issue. He was always a part of a solution, not part of the problem. And finally my own mother, whose compassion for the poor, for the downtrodden is unbelievable. In short, I would say that I have tried to imbibe these three qualities of innovation, compassion and passion from these role models of mine."

Summing his philosophy towards life and his achievements, Mashelkar said, "For everything that we do not have, we have to count what we have and make progress. I am also a great believer in thinking that the rest of our lives will be spent in the future and therefore, future is all that we should think about. My own personal life, the trials and tribulations through which I rose, has given me the confidence that anyone can reach this great height if one is at it." And this is also his message to the younger generation.

The future

Dr Mashelkar will be bidding adieu to CSIR on December 31 this year after a long and eventful stint but will remain active in the national and international science arena. In fact his 2007 calendar is fully booked. He will be taking up full time research at NCL as a CSIR Bhatnagar Fellow and will continue to be the President of INSA. He has also been elected the first President of Global Research Alliance (GRA), a forum of CSIR like institutions across the world, and will guide GRA to see how it can create a global knowledge pool for global good through massive global funding.

Rolly Dureha

Fact File Dr RA Mashelkar

Position: Director General, Council of Scientific and Industrial Research and Secretary, Department of Scientific & Industrial Research, Government of India

Date of Birth: January 1, 1943

Academics: Bachelor's degree in chemical engineering from Bombay University (1966); PhD from Bombay University (1969); Leverhume Research Fellow, Department of Chemical Engineering, University of Salford, UK (1969-1970). Twenty five universities have honored him with honorary doctorates, which include Universities of London, Salford, Pretoria, Wisconsin and Delhi.

Major Research Areas: Path-breaking contributions in transport phenomena in and thermodynamics of swelling, superswelling and shrinking polymers, modelling of polymerization reactors, and engineering analysis of non-Newtonian flows.

Awards & Accolades: Dr Mashelkar has won over 40 awards and medals, which include SS Bhatnagar Prize (1982), Padma Shri (1991), Pandit Jawaharlal Nehru Technology Award (1991), GD Birla Scientific Research Award (1993), JRD Tata Corporate Leadership Award (1998), PadmaBhushan (2000), Material Scientist of Year Award (2000), IMC Juran Quality Medal (2002), HRD Excellence Award (2002), Lal Bahadur Shastri National Award for Excellence in Public Administration and Management Sciences (2002), World Federation of Engineering Organizations (WFEO) Medal of Engineering Excellence by WFEO, Paris (2003), Lifetime Achievement Award by Indian Science Congress (2004) and by Hi-Tech Pune-Maharashtra (2006), the Science medal by TWAS, the Academy of Science for the Developing World (2005), Asutosh Mookherjee Memorial Award by Indian Science Congress (2005).

Other Hats: President of Indian National Science Academy; President, Global Research Alliance; President of the Institute of Chemical Engineers, UK; Fellow of Royal Society, London; Foreign Associate of National Academy of Science (USA); Foreign Fellow of US National Academy of Engineering; Fellow of Royal Academy of Engineering, UK; and Fellow of World Academy of Art and Science, USA.

Papers and Publications: 236 papers in national and international journals; Written 19 books and has 28 patents to his name.

"21st century will belong to Asia and in turn to India"

What has been the role of your family in your reaching iconic heights in this arena?

The fact that I am sitting here in this office is because I was able to have higher education and do advanced research. You will be surprised to note that this would not have been possible but for the drive of my mother. When I finished my college, my mother insisted that I do engineering. When I finished engineering, she insisted I do my doctorate. When I got my doctorate, she had found out that there is something more: post doctorate. I had often wondered from where she got this kind of drive and vision to make me educated. And then, it came out during my 60th birthday. There was a symposium in Pune and a big facilitation. During the celebrations, a reporter from Marathi daily Sakaal interviewed my mother. Normally she never comes out and speaks publicly. But the tape recorder was on and my mother just opened up to this reporter. She told her a story which even I did not know. When she was young, she had gone to the Congress House in Bombay for a job. She stood in the queue for almost a day and when her turn came, she was rejected. That was because she did not have the minimum educational qualification and do you know what that was? It was passing the third standard exam. She could have easily lied. There are no certificates for the third standard exam. But she had never done that. That was one of the values she gave to

me. While returning, she suddenly thought, 'Today, I am in this state mainly because I am not educated. I will make sure that my son gets the highest degree possible'. She did not know what that was but she wanted me to go as far as possible. That is how she has figured out about the post-doc. She was a remarkable lady, an unbelievable influence on my life. Unfortunately she passed away just a week ago in Pune, leaving a huge void in my life.

What do you consider your most significant achievements during your tenure at CSIR?

I would say it is the CSIR transformation brought about in the late Nineties. I am happy to see the warm applause CSIR transformation has received from across the board. Jayant Narlikar in his book The Scientific Edge (2003) lists the top ten achievements of the Indian science and technology in the 20th century and lists CSIR transformation as one of them. Soumantra Ghoshal, the Euro guru, who is no more, co-edited a book entitled World Class in India. He provided case studies of organizations which have managed the radical change, the best during 1991-2001. He covered CSIR transformation in a full chapter-along with Wipro, Infosys, etc. Business India has run a cover story on CSIR (July 1999) where they say-'CSIR labs have been transformed by the power of enterprise and proactive management'.

We have received repeated accolades from the Prime Minister, Atal Behari Vajpayee, who had said in 1997-'...CSIR has regained its dynamism and prestige besides showing itself to be capable of standing up to the challenges of liberalization and globalization'. Similarly, Dr Manmohan Singh, our current Prime Minister said-'I would like to congratulate CSIR for the remarkable transformation into a performance driven and user focused organization. The entire CSIR team deserves to be complemented for achieving this feat. ..... I am happy that CSIR is flying higher and further'. Dr A Watkins of World Bank has said-'In my work in the ECA region, I have recommended CSIR as a model of how countries can harness their top quality scientific research institutions to the task of industrial technology development, innovation and global competitiveness'.

What is your message to the scientific community?

Let us realize that from the history of science we are moving to a new geography of science. There is a new atlas that is being drawn and in this atlas, India and China are going to be the dominant players in the 21st century. I believe that the 21st century will belong to Asia and, in turn, it will belong to India. In making this happen, Indian science will have a critical role to play. We must generate new science which can create new technologies and our aim should be to attempt creating a new paradigm of technology layer with 'Rapid Inclusive Growth'. Each of these is an important word. Growth is important, we are growing at eight percent and we can go beyond it. Inclusion is important from a sense that the benefits of science and technology must reach to all sections of the society. The word Rapid is important since the faster we move, sooner will we have people who are below the poverty line come above the poverty line. And all this can be done through technology which is based on new exciting science.

What they said...

I have interacted with Dr Mashelkar from very close quarters almost from the time he took charge as Director General, CSIR. He is a rare person who can peep in the future and could create a vision which has far-reaching consequences. His re-engineering of CSIR has also been exceptional and remarkable. He is a born optimist and essentially whatever he touches, flourishes. His great contributions in the areas of patents, population, development of drug industry in India as well as a common one window clearance for biotherapeutics. I have not seen many persons like him in my lifetime. He is a great mentor and supporter of not only within CSIR but other organizations and institutes.

NK Ganguly, Director General, Indian Council of Medical Research

I have to say that Dr Mashelkar has served our country and the cause of science and technology with the greatest distinction. We all are proud of his achievements but I conclude by expressing the hope and prayer that perhaps we have not seen the best of him still-the best is yet to come. May his life and work continue to inspire generations of scientists and technologists in our country.

Prime Minister Dr Manmohan Singh