

## **DR P M BHARGAVA : A CRUSADER FOR SCIENTIFIC TEMPER**

by Chandana Chakrabarti

Indian scientists are, by and large, known to lead dual lives - a life in the lab that demands a rigorous scientific attitude of questioning and critical analysis, and a diametrically opposite one in their private sphere where the same scientific attitude is thrown to the four winds without any compunction while engaging in the most ridiculous superstitions. One scientist who stood out as a torchbearer of rationalism and humanism in this milieu of so-called scientists was Dr Pushpa Mitra Bhargava, fondly called PMB by friends and colleagues. He died on August 1st 2017, at the age of 89.

PMB was a visionary, scientist par excellence, writer, thinker, institution builder, administrator, a strong proponent of scientific temper, a great patron and supporter of all forms of art, a proactive citizen who took his duties as a citizen seriously, and above all a fearless man. He loved calling a spade a spade -- even when he was a government scientist-- without a care for consequences.

Born in Ajmer on 22nd Feb 1928 to a public health professional Dr Ram Chandra Bhargava and his wife, Gayatri, he was raised and educated in Varanasi, Allahabad and Lucknow. He was formally admitted to Besant Theosophical School in Varanasi for the first time at the age of ten, directly

He completed intermediate from Queen's College in Lucknow and then went on to get an MSc degree in chemistry from Lucknow University.

PMB started his research career in 1946 at Lucknow University working for a doctorate degree. He obtained a PhD in chemistry at the age of 22 and moved to Hyderabad. Between 1950 and 1953 he worked briefly at Osmania University, and then at Central Laboratories for Scientific and Industrial Research, both in Hyderabad.

From 1953 to 1956, he worked with Prof Charles Heidelberger at the University of Wisconsin, Madison, USA. His most significant contribution there, was to lay the foundation, in collaboration with several others in the laboratory of Heidelberger, of the discovery of 5-fluorouracil, the well-known anti-cancer drug which has found wide application.

During 1956-1957 for nearly one year, working at the National Institute for Medical Research in London, he transitioned to biology from chemistry. He came back to India in 1957 and joined his old laboratory at Hyderabad in 1958. This laboratory had by then been taken over by Council of Scientific and Industrial Research (CSIR) and named the Regional Research Laboratory (now called IICT).

PMB's scientific work has been characterized by several unusual features.

the first scientists in the country to make a transition to biology in which he did not have a formal lecture, and came to be considered one of the foremost modern biologists that our country has produced. Secondly, his work has covered an unusually vast spectrum. Thirdly, virtually all the areas he chose to work on represented at that time, major unsolved problems in biology.

Dr Bhargava's significant scientific contributions have covered a vast range of areas from reproductive biology, origin of life, and cancer biology to sociology of cells, organization of cells in tissues, and the soluble phase of cells. He coined the term "second genetic code".

His scientific work has been recognized in many ways. He has received over fifty major national and international awards and honours, including the Padma Bhushan from the president of India, the National Citizen's award and an honorary DSc degree from the University of Burdwan. He was one of the most highly cited Indian scientists. He also received France's highest civilian award Légion d'Honneur from the President of France.

## **CCMB**

Widely regarded as the architect of modern biology and biotechnology in

Indian science. Besides being one of the best equipped laboratories in the world, what made CCMB unique and different was its culture of sharing, openness, a 24x7 working institution, a hierarchy-free environment and an emphasis on all round excellence, be it research or the ancillary services. PMB scouted for talent from all over the world to set up the lab and resisted every pressure by recommendation from the highest quarters. A strong voice in favour of basic research, his voice will be specially missed in today's frontal and severe attack on basic science.

#### **OTHER INSTITUTIONS**

Besides CCMB, he set up the unique Guha Research Conferences (GRC) a prestigious club of biologists in India, more than half a century ago and biologists still vie to be elected to it. The Department of Biotechnology or the Centre for DNA Fingerprinting (CDFD) would not have come into existence if it were not for his efforts. In 1995, PMB set up The MARCH (The Medically Aware and Responsible Citizens of Hyderabad), a voluntary organisation that brought together doctors, hospital administrators, scientists, pharma industry personnel, and social workers to take up medical and health issues in Hyderabad. He was troubled by the practice of rampant kickbacks to doctors and the complete absence of self-regulation. Through the efforts of The MARCH, Hyderabad today has a biomedical waste handling system and the country has in place, a system of accreditation of diagnostic laboratories that ensures reliable test results, besides a draft bill to

Technologies, an area of medicine that has, unfortunately, seen rampant malpractice.

On one hand, PMB had the privilege of interacting with over 60 Nobel Laureates, with more than half of them having visited CCMB, and a large number of them being close friends. On the other hand, he was a people's scientist. He was ever ready to propagate scientific temper to fight obscurantism, shoulder-to-shoulder with activists of various people's science movements across the country.

#### **CRUSADER FOR SCIENTIFIC TEMPER**

Known as a crusader against irrationality, PMB's contributions towards the development of scientific temper, education and science policy in the country have also been significant.

#### **METHOD OF SCIENCE EXHIBITION**

The famous exhibition on The Method of Science he set up in Delhi in the late 1970s, shook the establishment and threatened those in power. He wrote, directed, created and mounted the Method of Science Exhibition, closely involving a whole team of scientists, artists and social activists.

exhibition set up in Bal Bhavan in Delhi, made the point that questioning is the most important requirement. When Janta Dal government came to power in 1977, the exhibition was vandalized overnight, stolen and dumped in a godown just before it was inaugurated. Apparently, they did not want it to be shown anywhere. After all, the method of science is all about questioning, and no totalitarian government wants people to be told that it is their right to question. The then Government feared that the opening of the exhibition could lead to a snowballing effect.

Not one to give up easily PMB bravely fought a prolonged legal battle against the government for justice and then began rebuilding it all over again. The exhibition was brought to Hyderabad, thanks to then Chief Minister Channa Reddy. Artists Surya Prakash and Laxma Goud were closely associated with exhibition. The exhibition was filmed and serialized in several periodicals. It has been estimated that two million people in the country were influenced by this exhibition.

#### **SCIENCE TEXT BOOK AND STATEMENT ON SCIENTIFIC TEMPER**

PMB wrote an integrated national science text book, which set up a new style of writing science text books. He played an important role in having scientific temper incorporated as a duty of the citizens of our country through Article 51A(h) in the 42nd constitutional amendment in 1976.

rational high-achievers of the country. The Statement issued over three decades ago, has been debated and discussed in several forums, and it continues to be referred to in writings and speeches even today.

In his crusade against superstition, he did not spare well-known and powerful godmen, be it Maharishi Mahesh Yogi and his claim of levitation, or Sathya Sai Baba and his third-rate magic. Neither did he spare people occupying the highest positions in the country who openly paid obeisance to charlatans.

### **Maharishi Mahesh Yogi**

In 1977 PMB was surprised to receive an invitation to speak at a Maharishi conference in Hyderabad. There he had a direct encounter with the godman. Maharishi Mahesh Yogi, the originator of the technique of Transcendental Meditation (TM) propagated that if 1% of the world population practiced TM, it would transform the world making all human problems disappear, and euphemistically called it the 'Maharishi Effect'. He had also famously claimed that he had initiated some 3,000 people into the art of flying and they had become 'flying yogis'.

Mahesh Yogi knew how important it was to woo scientists in order to gain credibility. A carefully cultivated ardent admirer was eminent physicist, E.C.G. Sudarshan, the first one to propose the existence of tachyons,

encounters with Sudarshan over the years, and the latter cleverly avoided demonstrating levitation under scrutiny.

At the conference, PMB did not mince words. He spoke his diametrically opposite mind loud and clear, despite a massive audience where it would have been difficult to find even ten people who would support his view. Mahesh Yogi was livid and there was pandemonium among the organizers, who had to rework the entire programme to stage a strong defense and a rebuttal to the damage PMB had caused. Sudarshan called PMB a 'doubting Thomas' and tried to make it light by saying how he admired PMB's exceptional courage. That afternoon an unknown person from the crowd whispered in PMB's ear that he should keep away from having lunch with Mahesh Yogi. PMB wisely took his advice.

### **SATHYA SAI BABA**

When Sathya Sai Baba died in April 2011, the media made it appear as if the nation was mourning an irreparable loss. PMB's article published in The Hindu, coldly demolished one by one, the edifice on which Sathya Sai Baba's divine stature rested. He reasoned that the phenomenon of reincarnation or rebirth was scientifically untenable and such claims the world over were found to be fake when investigated. He wrote that the national tragedy was in fact, Satya Sai Baba being given a State funeral and the country's highest leadership spending precious time and resources to have the godman's last

Given the mood of the disciples and the media's implicit support, it was indeed a brave act to criticize the godman openly. As expected, the article invited the wrath of blind supporters. PMB's email was choking with hundreds of vituperative and abusive letters. Surprisingly, a good forty per cent of them were extremely supportive. Sai Baba's pyre had not even cooled and currency worth millions, unaccounted gold, silver, diamonds, jewelry and watches were tumbling out of his personal chambers.

#### **COW SLAUGHTER**

In 1966, when there was a mass agitation called by RSS against cow slaughter, sadhus were on the streets wanting to storm the Parliament. A 48-hour curfew was imposed around Parliament house. In Hyderabad a meeting in RRLH called by PMB. Dr P Ramchandra Rao, a well known physician said at the meeting "Cows will eat us if we don't eat them". PMB started receiving threats and questions were raised as to why his services should be terminated. He was asked to depose in front of the high-power Justice Sarkar Committee, of which Golwalkar, head of RSS, Shankaracharya of Puri, and Verghese Kurian were members. PMB gave them a crash course on elementary biochemistry and showed them how milk and meat were formed by the same biochemical processes in the body, so if one could drink milk, one could also eat meat.

PMB would never let any opportunity go by to cite homeopathy as an example of extreme irrationality. He always maintained that if homeopathy was right, all of science had to be wrong. In July 2003, PMB was invited to speak at a meeting organised by the Federation of Atheist and Rationalist Associations. He demanded de-recognition of homeopathy as a 'medical' system and called for an end to government aid to support it. The next day a mob of 200 homeopaths descended on our office in Tarnaka and vandalized it. This did not deter PMB from continuing to speak against the irrational practice.

#### **ASTROLOGY**

PMB had written and spoken extensively at various platforms against astrology, presenting every conceivable argument to explain why astrology is unadulterated nonsense, completely non-scientific and, if anything at all, a nuisance. He even sued the BJP-led NDA Government, the University Grants Commission (UGC) for introducing courses in our universities that would lead to a BSc and MSc degree in vedic astrology, called 'Jyotir Vigyan'.

At a meeting of astrologers in Hyderabad he threw a challenge to all the astrologers. He had gone prepared with horoscopes of four individuals, between the ages of twenty and hundred, whose lives were well documented, and one of them was not alive. His challenge to the

10,000. But for every wrong prediction the group would need to pay him only Rs 1000. He was willing to deposit the money with any referee the Committee would nominate. He also said he was by no means rich but he was willing to give all he had. Not a single taker emerged from the body of 'distinguished' astrologers who had assembled there.

### **STAND ON GMOS**

He fought a courageous battle against release of genetically modified organisms, asking inconvenient questions about their safety, whether there was a real need, would they compromise the country's food sovereignty, were there better ways to deal with the problem; and what impact would they have on our farmers and on the environment. He was appointed Supreme Court's Observer on GEAC, when the regulatory body was found lacking in rigour and transparency.

### **PROACTIVE SCIENTIST**

PMB was elected to all the national science academies of the country. While scientists usually clamour for such memberships, he chose to resign from all the academies when he realized that the academies showed little concern for societal issues and had never taken an informed stand on any raging public issue, even against the utter lack of scientific temper among those holding responsible and highly visible positions.

country, PMB had no compunction in returning his Padma Bhushan award in November 2015. He spoke out defiantly against the unleashing of terror on our freedom.

Whether it was the Bhopal Gas tragedy in 1984, or speaking out against the Science Congress for its support to obscurantist beliefs, or supporting Rohit Vemula's cause in University of Hyderabad, or JNU's battles, PMB lost no time in standing up and being counted. In May 2003, at the peak of summer, when the Iraq war broke out, PMB well in his seventies, led a five kilometer march of fifty thousand people in Hyderabad to protest against the American aggression. Therefore, he earned the epithet of activist scientist and was unapologetic about it. PMB willy-nilly became the go-to man if one was fighting injustice of any kind.

But PMB was hardly the angry young man. Soft spoken and gentle but firm, he was a connoisseur of the arts, who felt that propagating a "temper of art" was just as important as propagating scientific temper. CCMB, thus became the first government scientific institution in the country to have an art gallery. He collaborated with his friend and legendary painter, MF Husain, to produce two publications that had Husain's paintings alongside PMB's writings.

Saddened by the recent happenings in the country, PMB wrote:

**Comment [A1]:** Suggest revision: an artistic temper or "a temper for the arts"

variety it has in all areas – be it religion or climate or food or biodiversity or customs or dress. We need to preserve this variety, which the present dispensation wishes to destroy.”

In PMB’s passing away a sane and important voice of reason has gone silent forever, at a time when we need such voices the most.