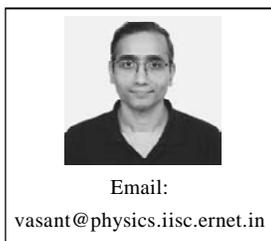


Editorial

Vasant Natarajan, Associate Editor



One of the greatest joys for a scientist is to see his (or her) students and wards do better than him – that he enabled the students to see farther by standing on the shoulders of giants. Because that is how scientific knowledge progresses. A science teacher is a guide who only shows the path of knowledge. He expects his students to use this method of thinking to expand and explore. In the words of John Wheeler, the scientist featured in this issue: “We live on an island surrounded by a sea of ignorance. As our island of knowledge grows, so does the shore of our ignorance.” Wheeler inspired a legion of students to shine brightly – often brighter than him – to expand this island of knowledge. None more so than Richard Feynman, who went on to win the Nobel Prize for devising the theory of quantum electrodynamics. The article by Rajaram Nityananda gives a glimpse of the work of some of his other students.

India too has produced outstanding scientists who were also inspiring teachers. The first name that comes to mind is that of Meghnad Saha (1893–1956). His theory of thermal ionization, captured in the Saha equation, was used to explain the long-standing puzzle of stellar spectra. It is (rightly) considered to be one of the ten most important contributions to astrophysics of all time. More important than this contribution to science is the fact that Saha, like Wheeler, was a teacher *par excellence*. It resulted in most of his students excelling in their fields. Amazingly, they excelled not just in science, but in diverse areas such as civil services, law, and even film-making. This shows that Saha was not only good at spotting talent but also in realizing what their talents were best suited for.

Resonance
wishes its readers
a Happy New Year.



Saha was the most socially conscious scientist that I know of. He realized very early that the widespread poverty and unemployment in India would not be solved unless scientists took an active part in tackling them. In addition to their ivory-tower research, they have to be involved in socially relevant research. Being a man of action rather than mere words, he was actively involved in national planning, river-water control, and calendar reform. He earned the wrath of the Congress Party by advocating large-scale industrialisation to solve India's poverty, and was against the Gandhian model of going back to the *charkha* and the old mode of village life, which he felt (correctly I think) was anachronistic and retrograde. He thought the best way to serve the people was as a Member of Parliament, to which he was duly elected as an *independent* non-Congress candidate from Calcutta in 1952. He served as an MP till his sudden death in 1956. I am sure our country and democracy will be well served if more people like him enter politics.

As a consequence of not heeding the wise and prescient words of Saha, India today needs socially relevant research more than ever before. It is a shame that, 65 years after independence, the majority of our population lives in abject poverty, with no proper access to sanitation or health care. We live in a dichotomous country, where 25% of our population is economically advanced with access to the latest technology, while the remainder wallow in inhuman conditions. Both of us live in the 21st century, except that one is in the 21st century *AD* and other is in the 21st century *BC*!

But scientists today are only recognized for 'irrelevant' research that gets published in international (western) journals. There are no rewards for doing research that can address our immediate social problems. People will argue that the development of Western Europe is because they had colonies that they could exploit economically, which India does not have. Hence our poverty. This is patently bogus, as the recent successes of south-east Asian countries like Malaysia and South Korea show. Seoul hosted the Olympics 25 years ago, and showcased to the world their social and economic development. We hosted the much smaller scale Commonwealth Games a couple of years ago, and showcased to the world our rampant corruption and the inability to get many venues ready in time.

Some people wish for a miracle cure, with such 'urban myths' going around that some untold wealth is lying hidden in an old temple vault, and encasing it will help erase India's foreign debt in one fell swoop. Well, wish on. If you want development, the only way is to set up modern factories, and work hard – getting our hands dirty as the Americans would say. There is no substitute to the kind



of low-wage manufacturing jobs that Malaysia and South Korea went through earlier, or that China is going through now.

It is easy to blame others, especially the British, for our problems. But this is belied by the fact that, after decades of self rule, we are worse off today on most human-development indices than when our colonial masters left. Let me close with one example. The river Cooum in Madras was an idyllic river in British times, and was used for romantic boat rides a century ago. Today, that is almost impossible to believe, because the unbearable stench that emanates from the same river will wake you from the deepest slumber as your train pulls up into the nearby Basin Bridge Junction, just a short distance before it reaches Madras Central Station. Every one knows that the sickening smell is caused by untreated industrial effluents being pumped into the poor river. And this has been happening not for one or two years, but half a century. Slum dwellers have been forced to live on its unhealthy banks for several generations now. Its inky black waters can only support the most hardy germs and disease-carrying mosquitos. But we know that all this can be solved in a few months through the concerted efforts of a few scientists and engineers (and some political will). It will make the water potable, and the river beautiful again. The city does not need to look for water from distant rivers like Krishna and Kaveri to quench its thirst. But are scientists and engineers up to this social challenge, as Saha would have been? Can we dream of boat rides in the Cooum once again?

