

India's contribution to science

I think I have found a valuable Indian contribution to science vocabulary. My Internet search for 'scientific temper' on Google on 10 May 2005, a day before National Technology Day, yielded 11,500 results. I found that a recent issue of *Science Reporter* has an article outlining an action plan for its promotion¹; the Second International Conference for Science Communication (ICSC 2003), 20–23 June 2003 had a whole session² devoted to it; before he became President, A. P. J. Abdul Kalam said on 19 June 2002 that every Indian should develop it; our present Prime Minister referred to it while giving away the S. S. Bhatnagar prizes for science and later while inaugurating the 92nd Indian Science Congress.

The coining of this phrase is attributed to our first Prime Minister, Jawaharlal Nehru, who is credited with being the architect along with H. J. Bhabha, of our first Scientific Policy Resolution way back in 1958, thereby making India one of the first countries to adopt such a resolution. Interestingly, one of the objectives of the National Youth Policy 1988 is... 'to help develop in the youth qualities of discipline, self-reliance, justice and fairplay, a burning concern for public weal, sporting spirit and above all a *scientific temper* (emphasis added) in their modes of thinking and action, which *inter alia*, will enable them to combat superstition, obscurantism and the numerous social ills that beset the nation...'

When I tried to get the exact definition, I could not find 'scientific temper' defined in any dictionary, either general or science and technology. Cambridge defines only science, scientific, scientifically, scientist. Webster's covers science, science fiction, scientific, scientific method, scientism,

scientist. Chambers gives only science as a separate term and all others (scienced, scient, scientific, scientology...) under it. Understandably, the Chambers S&T dictionary confines itself only to science. Not even the site which searches 992 on-line English dictionaries could find the term. Of all the dictionary terms, the definition of 'scientism' comes closest... 'the methods or mental attitude of scientists'.

One would have thought that with so much coverage in our media, the term would have been well established. Even *Current Science*³ uses it. In fact, it was the recent editorial paying tribute to late H. Narasimhaiah which started me off on this voyage of discovery. However, this seems to be a peculiarly Indian usage (like pre-pone). I was surprised when I studied in detail the first 150 of the 11,500 hits and found that except four, all the other pages were from India!

However, others have written on this issue, what we commonly understand by this term; the spirit of enquiry and curiosity. I think this is what Feynman⁴ found lacking in the students of Brazil, though he had not used the term as such. When I read his account of teaching science to a group of students – how the students could answer very well if asked direct questions, but could not derive anything by themselves; how they were unable to solve problems; how they were learning everything by heart; how other teachers dictated notes in class and how all the students religiously copied them; how asking questions was discouraged in class as waste of time – I found that the same could be applied to India as well!

Recently, however, the coinage is gaining popularity. No less a person than Bruce

Alberts, President, National Academy of Sciences, USA has referred to this. Writing the President's column on 'Science in Society for the 21st Century' in the *Infocus* journal⁵, he says 'India's Prime Minister, Jawaharlal Nehru had it right when he emphasized, some fifty years ago the importance of imparting a scientific temper to his nation'. Alberts conveyed this message again while delivering the keynote lecture at the 75th annual meeting of the Mississippi Academy of Sciences in February this year. These were two of the four 'hits' of non-Indian origin in my search.

The other two hits pertained to a book in German; so slowly but surely we are getting there. This pithy phrase, which describes succinctly the qualities every thinking citizen should have, will probably make it to the next edition of dictionaries. Even as I am giving the final reading to my print-out, I find Narlikar has used it while discussing about his latest science fiction book!

1. Singh, D. P., *Sci. Rep.*, 2004, **41**, 26–28.
2. <http://216.15.204.147/cgi-bin/ncsc/Bulletin.asp>.
3. Balaram, P., *Curr. Sci.*, 2005, **88**, 329–330.
4. Feynman, R. P., *Surely You're Joking, Mr. Feynman*, Unwin, London, 1985, pp. 199–220.
5. <http://infocusmagazine.org/4.3/president.html>.

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The future of postdocs

Due to wide variations in curriculum and course work in Master's degree programmes in Indian universities, those who emerge from some institutions have disadvantages due to inadequate infrastructure facilities and lack of adequate teaching. In the newer universities, omnibus 'life sciences' departments were created, which have failed to develop in traditional areas, while

struggling to carve a niche in modern biology¹. Several students get their PG degrees every year from such institutions and some of them choose to do a Ph D.

After getting a Ph D degree, there is the million dollar question about the career of the doctoral candidate. One can continue his/her research after submission of thesis, with extended SRF post from CSIR.

With a Ph D degree, one can either get a RA/SRA post from CSIR or Young Scientist (fast track scheme, international network programme) post from DST. Since the number of fellowships available is merely one-tenth of the actual number of Ph Ds, meritorious scholars may sometimes not be able to get a berth. Some may also be unemployed or under-employed. Mostly,

This list of Indian inventions and discoveries details the inventions, scientific discoveries and contributions of India, including the ancient, classical and post-classical nations in the subcontinent historically referred to as India and the modern Indian state. It draws from the whole cultural and technological history of India, during which architecture, astronomy, cartography, metallurgy, logic, mathematics, metrology and mineralogy were among the branches of study pursued by its scholars. During India has always contributed to the world and science is one of them. He headed a team that made great progress in radio and micro-optics. His contributions to the field of science were recognized by naming a crater on the moon behalf of his name. C.V. Raman contributed to the field of Physics and came up with the discovery of Raman Effect. He was awarded Bharat Ratna award and the Nobel Prize. Great contributions to the field of atomic physics have been done by Homi J. Bhabha. The Bhabha Atomic Research Institute was initiated by him and it has been instrumental in its own field of research. Salim Ali contributed to the field of science by developing Ornitholog