

In the first editorial of JST, I argued that, over a period of time in Europe, notions about 'secularism' had undergone radical transformation. These changes occurred when European cultures encountered the 'permeable membranes' of cultures in other parts of the world (Raza *et. al.*, 2002)¹. Embedded in the idea of the 'enlightenment', secularism constitutes a nebulous notion and is represented as a set of values that could adapt to different conditions as it travels the complex space occupied by time and cultural spaces. Pt. Nehru, the first Prime Minister of India, carved out a separate space within the evolving notion of a 'secular value system' and termed it 'scientific temper'.

Though the term 'scientific temper' might be a fuzzy notion, it does not mean that at a given point of time, the distinct features that characterise this term cannot be identified. Both science and society continually evolve and, therefore, the relationship between the two is dynamic, nonlinear, complex and ever-changing *vis-à-vis* a social structure. Consequently, contours of the science-society-linkage also change as it encounters different socio-cultural structures.

As opposed to continuous progress within the scientific-knowledge-complex, in other structures of configuring the cosmos, and its reality, the ultimate truth is frozen in time. These structures of thought put together could be termed as extra-science. Across cultures or religious groups, which subscribe to extra-science, perceptions about the ultimate truth may change radically, but within a specific thought structure, compared to science, perceptions do not change with time. The rigidity, inherent in thought structure, does not allow any radical change, *i.e.*, these are frozen in time. This renders the propagation of extra-scientific messages easy; the repeatability ensures crystallization of perceptions within the thought structure of a common citizen.

¹ Raza G, Singh S & Dutt B (2002) Public, Science and Cultural Distance, *Science Communication* 23 (3): pp. 293-308.

Scientific information is often counterintuitive and changes, often radically. In other words, paradigm shifts or, to borrow a phrase from dialectical materialism, even ‘quantitative changes’, that come about in scientific-knowledge-complex are not a function of variation in cultural spaces (Kuhn, 1996)². These shifts materialise on the timeline, and initially, dominate the spaces of consciousness that scientific community holds. Usually, after the validation and broad acceptance of a new piece of information or a new scientific theory by the scientific community, with the passage of time the new ideas seep through the national, regional, cultural, linguistic and even religious boundaries and tend to occupy thought complexes of the non-expert populace. Conversely, in extra-science different religious-cultural spaces offer different ‘truths’ but within a group the ideas once accepted do not change with time. This difference makes the task of creating a scientifically tempered society, increasingly difficult.

At the micro level, I have argued elsewhere, the cognitive structure of a common citizen contains spaces, which are secular, materialistic and scientifically shaped (Raza *et al.*, 1999). It also consists of extra-scientific ideas. These two, diametrically opposite and contradictory spaces, continue to co-exist peacefully. A common citizen invokes one or the other, depending upon the nature of the problem that s/he encounters during quotidian life through an assessment of what option will furnish her/him the desired results. Science communicators strive to propagate secular facts and scientific tenets aimed at enlarging the scientific cognitive space and presume that it will reduce the extra-scientific space. Evidence, however, indicates increase in scientific information does not necessarily result in reduction of extra-scientific beliefs. Had that been the case no scientist would have ever invoked supernatural powers. One could cite a significant number of Nobel Laureates, who have been honoured for their scientific achievements and were deeply religious throughout their life.

² Kuhn T S (1996) The structure of scientific revolution, Third edition, The University of Chicago Press.

The project of ‘spreading scientific temper’, which is a constitutional duty of the citizens in India, is a quite complex one. Spreading scientific awareness is only a precondition for creation of scientific temper. It follows that science popularisation cannot be an end in itself. When we are dealing with complex processes, more often than not, simple arithmetic may not lead us anywhere; two plus two does not add up to four. The multi-dimensionality and nonlinearity of processes involved forbids it. Let me borrow a notion from physics, there are always a few social and cultural dimensions which are ‘curled up’, and remain hidden from observer’s eyes, any small perturbation in those dimensions may cause a butterfly effect, and all prediction may prove to be wrong (Greene, 1999)³.

Carefully chalked out strategies for communicating science, may often not yield the desired results. For example, national surveys carried out in the western countries have repeatedly reported inconsequential increase in scientific literacy. NSF and Eurobarometer reports published over the last 20 years show how worrisome the situation has remained. Scholars repeatedly have questioned indicators and methodologies followed for carrying out these studies. However, the broad conclusions reflect the concern of science communicators that their efforts have not made any significant change.

Scientific temper refers to a broad set of values that are rooted in ‘enlightenment’⁴. These values touch areas of human cognition and actions beyond the boundaries of science and impinge upon the domain of extra-science (Nehru, 1945). Therefore, when these values encounter different cultural groups or sub-groups on a time-cultural space map, it is important to trace out the spaces occupied by the extra-science. Subsequently, from the broad set of values draw a list of elements, which will help in claiming larger space during the struggle for creating a scientifically tempered society.

³ Greene B (1999) *The Elegant Universe: Superstrings, Hidden Dimensions, and the Quest for the Ultimate Theory*, Vintage Nehru J L (1994) *The Discovery of India* (first published in 1946), Oxford University Press.

⁴ Raza G (2012) *Scientific Temper and Indian Democracy* (ed.) Banger P and Schiele B, *Science communication today, International perspectives, issues and strategies*, Jourees Hubert-Curien, Nancy.

The project of 'spreading scientific temper' demands continuous research that should probe social, cultural, religious, economic, political (the list by no means is exhaustive) realities that contribute to the propagation of scientific temper or impede it. There is a need to continually revisit the nebulous notion that scientific temper is. JST is a humble effort towards keeping the debate alive.

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