Educational Dialogue

Strategies for using history of science to reflect upon the Nature of Science.

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Venue : Vigyan Prasar, ASCI Building, C 24 Qutab Inst Area New Delhi

(Basement hall)

Time 4 pm to 6 pm.

Abstract of the talk

If what is in a 'book' is adequate reason to hold a view valid, then we must believe that "the Earth like a lotus flower floating on a pan of water, with seven petals open. Each petal is an island; the water in the pan are the oceans, the central seed cup of the lotus is the mount Meru. Now the Sun goes around the Meru, and as the shadow falls and recedes, day and night occur. Moon is above Sun and Meru." This is the Puranic description of Earth and how day and night occurs.

This raises a number of related questions. What is the purpose of science education? Why we need science education for all? What does it mean to teach science?

Purpose of science education goes beyond being mere factoids.

A proper understanding of science involves more than *what is* (the ontological question). Questions such as *how we know* (the epistemological question), *why it happens* (the causal question), *what we can do with it* (the technological question), and the *communicative question* (how we should talk about science) are constitutive of "science".

NCF position paper states that science curriculum be informed by a historical perspective, enabling the learner to appreciate how the concepts of science evolve with time. It also helps the learner to view science as a social enterprise and to understand how social factors influence the development of science. Further that science be placed in the wider context of the learner's environment.

Yet the school science is often presented as unproblematic straightforward 'facts'. *What is* is overemphasis at the expense of the other facets of science and the issues of 'how we know what we know' are relegated. The sin of omission, omission of nature of science in school science is not just an neglect. While a teacher may think innocently that she is teaching only the content of science, they are implicitly communicating ideas about the nature of science and scientists which are often fallacious. While science in fact is often modified, adapted, or even at times, abandoned it is presented as 'final-form' product with immutable and definitive qualities.

School science, residing solely in the context of justification rather than the context of discovery, simply fails to convey that controversy or argumentation are a normal feature of science. After all science as they have been introduced is exact, 'true' and absolute. When public controversies, such

as GMOs, nuclear energy or mass vaccination, erupt the public either take a position of blind support or virulent opposition; nuanced appreciation of science becomes a casualty.

The goals of school science education is projected as critical scientific literacy. Even if most of the students are NOT going to become scientists or engineers, all of us will be consumers of scientific knowledge. As consumers we have to be informed to be able to make the right choices as individuals and society. It is this perception that is invoked to justify universal education in science for all. If one hopes that the school science education will nurture citizenship in a participatory democracy, then it is clear that nature of science should form essential part of the school science.

The proposed talk aims to examine some of the above ideas and discuss ways of exploring the Nature of Science in the classroom discussion using some practical illustrations.