

The importance of HiST(ory) for S&T

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It is ironical that a country like India with a hoary tradition of science and technology does not yet have departments dedicated to studying and teaching of the history of science and technology. But fortunately there has been considerable research and teaching - especially in the last four decades - by individuals or groups working in the history/sociology departments of universities or in research centres (like the National Institute of Science, Technology and Development Studies - NISTADS - for instance). Considering the breadth and depth of the Indian heritage, and engagements with scientific and technological traditions emanating from different parts of the globe over vast centuries, there is much room and scope available for scholarly research yet in the years ahead. While such unearthing and deeper understanding progresses on the one hand, it is also important to make the fruits of such work available constantly to the wider world. This ought to be not only in terms of publications and the discussions and teaching of the same in the departments of history but also through the spread and appreciation of it among practitioners and students of sciences and technology too.

The importance of History of Science and Technology [HiST] to the world of S&T and to the public at large is manifold. One of the important attributes and concerns about the course of modern S&T - especially science - in the past few decades is that it is becoming increasingly esoteric - making sense only to those within the circumscribed world of specialists. With increasing specialization, specific fields of science become esoteric not only to the lay public but even to members of the broader S&T community who do not belong to the particular specialty. While this is inevitable to some extent (with the consoling fact that its constricting effects are mitigated and counterbalanced internally, to some extent by the simultaneous trend of the increasingly interdisciplinary nature of research pursuits), it is important externally to nourish and cherish the bridges between S&T and wider society. There is no gainsaying the fact that S&T and its practitioners are very much products of social and cultural forces and factors. One of the ways of constantly reinforcing this connectedness is through a serious sociological and historical analysis of the processes in various domains of S&T over the centuries. More importantly, students of S&T ought to be exposed to this kind of literature so that they are connected by heart and mind simultaneously to the social aspects of S&T and to the past heritage.

Such exposure will reinforce in them the social dimensions and functions of science rather than keeping them sunk merely in their world of equations, calculations, related examinations and career advancements. This connectedness has the advantage of making them also more socially conscientious which in turn can spur them to make a substantial part of their professional life socially relevant - reasonably alert to the changing needs of society and the aspirations of fellow countrymen - especially the many who are still struggling under the avoidable burdens of economic, knowledge, and digital divides in society. An added advantage of such connectedness for students of S&T (even as they try effectively to address socio-economic concerns through the power of S&T) is to help them come out of the trap of technological determinism - that fanciful but deep belief in technology not only as the THE driving force of history/society, but also that it (technology) can solve ALL problems - including those created by itself. The connectedness and practical engagement with society (coinciding with the understanding and appreciation of similar connections in the past) will help them realise that technology has to contend with many social, cultural and attitudinal issues that are beyond the scope of technology itself to address fully.

Such realization in turn will help in building healthy relationship with, and regard for, professionals from other fields especially beyond S&T - like social workers, historians, economists and sociologists. Not only will this bring an element of modesty and openness but extend the scope of interdisciplinary research beyond S&T - leading to fruitful policy/action-oriented ventures which will make S&T more socially relevant and effective, while also being sensitive to some of the challenging ecological and other problems caused by non-judicious and less-contextual use of S&T. HiST will be of particular use with regard to this. One of the advantages of an objective and sensitive study of history of technology with the benefit of (non-hasty) hindsight is the ability to have a new look at forgotten alternatives, aborted discoveries, and 'paths not taken'. There would be several of them either overlooked or deliberately marginalized due to mistaken priorities or political expediencies or imbalances - especially under colonial domination. The study of history of technology particularly with sensitivity to this aspect will not only lead to an appreciation of missed opportunities but also (in a practical way), to seek balanced approaches to solving contemporary problems without excessive obsession with what is seen as 'modern', accompanied by a stiff resistance or indifference to what is perceived as 'traditional'. It will also lead to creative and context-based hybrid technology thus embodying a living dialogue between the past and the present (for a better and more ecologically secure future).

One of the other important merits of the study of HiST generally and particularly by students and practitioners of S&T is to attain a more informed understanding of the enterprise of S&T beyond the stereotyped image of its being a fully 'objective' and 'rational' endeavour. It is important to realize and to be aware of the many (human) factors beyond the rational, that shape(d) the motives and careers of outstanding men and women of S&T throughout history. This can contribute to a sense

of modesty and sensitivity to the potential wrong trajectories that S&T can take due to inherent frailties and fallibilities of mankind even as we intend to make the world an ever better place through our S&T innovations. Above all, it will keep them firmly rooted in the human (context), even as their fields of research and practical S&T activities may lead them through esoteric avenues.

This in turn has implications for another important domain - which very rightly, is being talked much about in recent decades - the 'public understanding of science'. Public understanding of S&T has become an important concern with increasing democratic activities of different kinds especially with the spread of modern ICTs (Information and Communication Technologies) which are valuable tools for empowerment but which can be used to spread misinformation as much as information, by ALL sides. With rising contestations about the proper use of S&T especially in developmental activities (with diverging visions of what 'development' is), and increasingly public expressions of the same - including violent ones, some leading even to tragic deaths - it is important to promote healthy dialogue between S&T (practitioners) and its various stake holders - especially the broader public. Maintaining the human dimension and rootedness is very crucial for practitioners of S&T so that their credibility is at a high when they reach out to the public rather than giving the impression of coming out (or worse coming 'down') with a conscious sense of 'difference' - with the associated baggage of attitudes towards and about the 'ignorant public'.

Finally at a very personal level, the study of HiST can have fruitful influences on students and practitioners of S&T in terms of inspiration and finding greater meaning to their lives and vocations. A study of the little known dimension of the life of Jagadis Chandra Bose (1858-1937) as an 'instrumentation' expert in his own right - building his own (highly sensitive) instruments for his various experiments using minimum available materials, under the extremely constraining conditions of colonialism, is bound to inspire sensitive young minds and equip them better to face challenges of different kinds in today's scenario - especially in situations where there is perceived 'fund-crunch'. An awareness of the struggles of Michael Faraday (1791-1867) - whose early interest in electrical science and engineering was nurtured while he laboured as a poor youngster in a book-binding shop where the papers of Humphrey Davy (1778 - 1829) came for binding - can not fail to make at least a small spark in some corner of an impressionable heart. An examination of the life of a Ludwig Prandtl (1875—1953) who on the one hand is hailed as the father of modern aerodynamics but was also one who was happy to serve the Nazi war agenda and found justifications for it, would spur one to relate it to the moral dilemmas that practitioners of S&T might face in the call to deploy their expertise in the 'service of the nation' in questionable ways today. An informed (and even a technological) study of some of the architectural, metallurgical and textiles-related accomplishments of those who did them centuries and millennia ago with corresponding limited resources, is bound to instill a sense of pride and also a more proper attitude to those 'non-modern' (wo)men and their works, and therefore again a sense of modesty, while contributing to the 'enormous power' of S&T to shape human ends today.

To conclude, one should be conscious of the fact that even as the world of S&T cherishes and expects 'scientific temper' from broader society (which is right and is needed ever more today), it is also worthwhile to nurture among students and practitioners of S&T, the equally important 'human[ities] temper'.

About the author



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Politicians, real-estate agents, used-car salesmen, and advertising copy-writers are expected to stretch facts in self-serving directions, but scientists who falsify their results are regarded by their peers as committing an inexcusable crime. Yet the sad fact is that the history of science swarms with cases of outright fakery and instances of scientists who unconsciously distorted their work by seeing it through lenses of passionately held beliefs.

— Martin Gardner