

Scientific Temper Statement Revisited-2011

The Palampur Declaration

Recapitulation of the 1980s Spirit

The concept of Scientific Temper was articulated first by Pandit Jawaharlal Nehru in 1946 in his book *Discovery of India*, referring to it as "a way of life, a process of thinking, a method of acting and associating with our fellowmen". The tradition of skepticism and humanism is not new to Indian intellectual tradition. Such notions go back to antiquity – Jain, Sankya, and Buddhist traditions have repeatedly emphasized the spirit of enquiry. During the Indian renaissance many leaders popularised the notion of scientific enquiry and gradually it became part of Indian ethos.

Nehru was instrumental in laying the foundations for building the infrastructure for science and technology in India – the Universities, the IITs, the CSIR labs, etc. These became the 'hardware' of science and technology in India, while Scientific Temper among the people of India was to be the 'software'. In 1976, India became the first country to include in its Constitution 'Scientific Temper with humanism' as a fundamental duty of all citizens of the country [Article 51-A(h)].

Four years later, in October 1980, a group of academicians and intellectuals deliberated for four days at Coonoor, near Ooty, on the state of Scientific Temper in the country. Out of those deliberations was born 'A Statement on Scientific Temper', which was released on 19 July 1981. This document articulated the need to inculcate the values of Scientific Temper in the Indian Society to rid the country of its socio-economic ills at that time. The Statement was expected to usher in a movement—a second Indian Renaissance—in India to 'provide the necessary fillip for restructuring our country embodying the aspirations of our people'. Broadly, the statement extolled the virtues of the scientific method as an antidote to the traditional religious and/or superstitious dogmas that prevail in our country. In recent times, the hold of such antiquarian beliefs has become greatly widespread in the country through television channels, and lately, through the Internet.

The preamble to the Statement noted the continuous accumulation of knowledge by which allowed mankind exercise control over the environment. However, the spread and adoption of mankind's knowledge has been uneven due to prevalent schisms across the world and control over such knowledge by the elites. In such a bleak situation, fatalism prevails, reinforcing obscurantism, irrationalism and a retreat from reason. To advance in the scientific age, we must understand the meanings and imperatives of scientific temper – which in essence is 'humanity's assertion of being in charge of its destiny and not a passive victim of malevolence of stars'. Scientific Temper thus becomes an imperative for a brighter future for our country.

The Statement goes on to include in its definition of Scientific Temper as the method of science that encompasses all human knowledge cutting across the natural sciences and the social sciences. 'The spirit of inquiry and the acceptance of the right to question and be questioned are fundamental in scientific temper.' It considers knowledge as open ended and ever evolving. Scientific Temper is incompatible with theological and metaphysical beliefs. While science is universal, religions and their dogmas are divisive. Scientific Temper cannot flourish in a grossly inequalitarian society where 50 per cent of the population lives below the poverty line and almost 70 per cent of our people, especially women, are functionally illiterate. Social justice, widespread

education and unrestricted communication are pre-requisites for the spread of Scientific Temper and, therefore, optimizing the results of science and technology.

The Statement called for a major role of Scientific Temper in reviving confidence and hope and dispelling a fatalistic outlook. The campaign to promote Scientific Temper must inculcate values like equality and dignity of labour and social accountability of one's actions. The Statement also cautioned against using scientific and technological solutions as 'magic bullets' for every problem in the country. 'The nature of social stratification and the power structure in a society prevents the acceptance of such solutions. Technologically, one may be able to grow enough food for everyone, but the pattern of income distribution prevents the benefits of increased food production reaching large segments of the population. When the social structure and stratification prevent the application of rational and scientifically proven solutions, the role of Scientific Temper is to lay bare the anatomy of such social barriers.'

The debates and discussions on Scientific Temper that the Statement initially, have not continued in India towards ushering a second renaissance, at least to the extent that the signatories wished. Scientific Temper remained largely confined to rhetorical statements. Sadly even social scientists did not make an effort to refine this concept or operationalise the concept for measuring/gauging Scientific Temper. It behoves us to retrieve this concept before it is lost in the cacophony triggered by the changing scientific, technological and economic order. Thus, there is a need to revisit the 1981 Statement.

The intellectual space left untapped by academicians and the state structures has been to an extent occupied by various voluntary organisations (also called NGOs and Civil Society organisations). Since the 1980s, there has been a substantial growth in the number of these organisations. What impact these various efforts have had on the inculcation of Scientific Temper in the population is yet to be studied, but what is clear is that these efforts, though commendable, have not been able to change the direction of the tide of irrationality.

Ever since the 1981 Statement was released, two opposite, and yet synchronous, changes have been observed in the country. It should be noted with some satisfaction that the combined effect of efforts made to propagate scientific ideas in the country, to which people's science movements and scientific institutions have contributed in a large measure, have definitely made a difference, however small it may be. Such efforts had modest impact as in the case of bringing out large numbers of people to watch the 'total solar eclipse' during 1995 or critically appraising public policies as in the case of the Silent Valley Project.

But, at the same time, during the past 30 years there has been a marked increase in public display of religious and sectarian identities, ascendance of irrational cults, glorification of obscurantist practices, religiosity and wielding of religious symbols. This has provided the ideological basis for, at times, brutal unscientific actions in both public and personal domains. Discrimination based on caste, gender and ethnic identities, perpetuated on the basis of irrational beliefs and superstitions are still widely prevalent, and are a blot on our society. Privatisation of electronic media has also had the undesirable effect of providing increased space for forces responsible for the spread of irrationality and undermining scientific temper.

Changing World Order

During the last two decades many parts of the world also witnessed new and large scale social movements against the new world order—often described as neo-liberal regimes advocating market fundamentalism and withdrawal of the state from economic and social sectors. These movements were ostensibly mobilised on the basis of rational objective knowledge on issues facing different sections of the populations.

The most significant development in the world during the past two decades has been the accelerated globalisation of trade and services aided by the extensive penetration of Information and Communication Technologies (ICTs). The ushering in of the Internet and the World Wide Web paved the way for consolidation of economic hegemony of transnational companies (and TNCs) all over the world and its natural resources.

On the other hand, neo-liberal regimes also laid the ground for organised international resistance against such hegemonies. Creation of large cyber spaces has revolutionised the storing, searching and retrieval of electronic documents, including scientific publications. The barriers that confined scientific knowledge among a few have been broken, empowering researchers in developing countries by making scientific corpora available to them with considerably reduced lag period. Today, a possibility exists for non-experts to access scientific knowledge on varied subjects with a click of a button. This process is causing erosion of the ‘almost religious authority’ that science experts exercised hitherto. The democratic, open, transparent and egalitarian nature of science is reasserting itself on a much bigger scale today.

It is needless to overemphasise that this cyber space is also available to those who spread occult and unscientific ideas. In fact, using this space they are meticulously trying to enlarge their constituency. In India, efforts to counter these forces by making use of the same cyber space has, unfortunately, been found wanting.

Developments in biotechnology have also had a profound impact on all spheres of human existence. It has started bringing new research insights into almost all conventional disciplines of natural and social sciences. It has also generated heated public debates all over the globe and has given birth to resistance movements.

The above developments are likely to have a profound impact not only on social relations but may also intensely influence man-nature relationships..

Current State of Science and Technology (S&T)

In the last two decades there has been an unprecedented increase in the World’s stocks and flows of human resources and research output, in terms of academic publications and patents. The world has witnessed a shift from industrial economy to ‘knowledge economy’. In this changed world order, India is struggling to increase its scientific and economic share. However, with its still high rate of illiteracy and lack of universal education the relevant questions such as ‘what constitutes education?’, ‘what does knowledge society mean in the Indian context?’ and ‘whose knowledge counts in this knowledge society?’ assume importance.

The character and nature of scientific praxis has also changed during the last 20 years or so. For a long time production of scientific knowledge and its application and relevance were not separated

and science was expected to serve the state in respect to the security and welfare of its citizens. Thus, S&T served well in the growth of industrial economies of both the capitalist and the socialist countries. Unfortunately, the neo-liberal regimes of many countries (including India) have changed this social contract of science in favour of markets and corporate entities.

The privatization of research and academic institutions through IPRs has resulted in blurring the boundaries of basic and applied research and their relation to technology, such as in biology. In the academic and policy circles science is being replaced by ‘innovation’—which is a mix of science, technology, management, marketing, organisations, and a host of other things. It is innovation studies or innovation policies and competition among firms and nations now dominate the intellectual and policy space. It is innovation that is used as a benchmark of economic growth and development. For ordinary citizens technology and gadgets are today the most tangible manifestations of ‘science’.

The fast pace of technological intrusion, without essential back-up support of scientific knowledge base, introduces cultural and social distortions within traditional cognitive structures. Lack of effort at providing the necessary complementary scientific knowledge base for the population at large is consolidating these distortions resulting in the corrosion of democratic structures. Moreover, technology-driven modernisation creates a cognitive gap due to loss of traditional knowledge, which is being filled in by religiosity in new forms.

Relevance of Scientific Temper in today’s World

In view of the concerns expressed above, we feel that scientific temper should be strengthened and diffused widely in our society. In some sense, Scientific Temper can be equated to application of the scientific method based on logic and evidence. Scientific Temper in this sense is also privileged and seen as antithetical to ‘revealed knowledge’, evidence for which does not go beyond religious scriptures or superstitious beliefs. Science, on the other hand, holds that life, mind and universe can be understood without invoking the supernatural and revealed knowledge. Scientific knowledge is thus universal and is reliable in contradistinction to the so-called revealed knowledge and the diverse metaphysical interpretations of life and the universe, which form the basis of the various religions and associated superstitious beliefs.

Scientific Temper is essentially a world-view, an outlook, enabling ordinary citizens to choose efficient and reliable knowledge while making decisions in their individual and social domains. It is not the content or extent of knowledge base of one or other domain of scientific corpus that a citizen acquires, but rather the pursuit of rational enquiry, which is the hallmark of Scientific Temper.

Social phenomena do not easily lend to experimentation or verification. Thus, if Scientific Temper were to be diffused to ‘solve mundane problems’ of ordinary citizens, the methods of science would have to be enlarged and re-defined in inter-disciplinary perspectives. “The understanding of the social phenomena and human behavior, knowledge about the social process and its determinants, are essential for designing policies to promote social change and to produce a dynamic society capable of absorbing and utilizing the scientific and technological developments for the welfare of human beings” (VKRV Rao)

Science and technology have contributed at a macro level to the socioeconomic development of India and the world at large. India could ward off famines and import of food grains in the 1960s

largely through Green Revolution, which also had the unfortunate effect of causing income disparities and environmental degradation. The solution to these problems will come from new scientific and technological initiatives and people-oriented policies.

The average life span of Indians increased due to availability of antibiotics against some common diseases. Similarly, communication facilities have expanded with the advent of the TV, mobile phones and the penetration of computers and Internet. Yet disparities in the availability and access to education continue to grow, and fruits of science and technology do not reach across the regions, religious sects, gender, and castes. It may be worth gauging how far these economic and scientific achievements - and Scientific Temper - in India have percolated down to the common man. As scientific progress outstrips scientific understanding, citizens that are increasingly reliant on science and technology and yet largely ignorant of their workings, would be at a great disadvantage. Correspondingly, their participation in the democratic process would be increasingly marginalised. The growth of Scientific Temper is a measure of the extent to which the society applies the methods of science to solve its problems.

Advocates of Scientific Temper have often identified superstitions and religious beliefs as the main target of opposition. In this sense, Scientific Temper is an 'ideology' pitted against these religio-centric ideologies. Unfortunately, in India this process—termed as 'transmitter model' in literature—could not succeed in effecting changes in the people's attitudes or values. In fact, over the years, there has been an increase in the public display of religious activities by public figures in all walks of life.

This situation is made worse when even scientists actively participate in such religio-centric rituals in the public domain. Many scientists publicly profess their faith in 'gurus' and 'babas' in India. With the spread of the electronic media—the TV and the Internet—these public (and private) activities are in constant public gaze and much of this content can also be stored and recalled. Such displays by scientists weaken their position as role models for the practice of scientific temper.

Public display of religious symbols, figures, images and artefacts in government offices, religious ceremonies in institutes and educational institutions and religious invocations during inaugurations of scientific conferences, mar the secular character of these institutions in particular and the Indian State in general. A number of these acts are legitimised in the garb of 'culture'. In order to secure its constitutional obligation, the state must forbid such displays within government owned spaces.

The recent spurt in providing legitimacy to the 'occult' by dubbing it as scientific is a disturbing phenomenon. Some may argue that it is in a way acceptance of supremacy of science over other forms of knowledge generation, but such acts not only discredit 'science' they also use science as a saleable commodity. It is necessary to create regulatory mechanisms against the dissemination of such unscientific and irrational messages and devise ways that enable corrective measures to be taken.

Modern education is the strongest determinant of scientific information, knowledge and attitude. It is true that over the years scientific information base in the country has enlarged, but it will be far from reality to assume that this information is getting transformed into knowledge and thereby bringing a change in attitude. Unfortunately, our education system is still not sufficiently evolved to inculcate Scientific Temper in young minds.

The growth of mass media as a means of transmitting science related information started with the print media—academic journals to communicate the results of scientific research, newspapers and magazines to communicate science to citizens. Later radio broadcasts have added to these channels of communications. The biggest impact of mass media, however, came with television. It should be noted with utmost concern that TV has emerged as the most potent agency spreading anti-scientific temper in India. Freedom of expression is being used as freedom of propagating irrational, outmoded and antiquated ideas. Thus, ironically the latest technology is being used to propagate anti-science beliefs. Today, there are a large number of religious channels but there is not a single Indian science channel.

Fundamentalist forces selectively embrace technology and make use of these technologies to propagate outmoded ideas. It is propagation of modern scientific knowledge that hits at the core of irrationality and is therefore not acceptable to them.

A Strategy for Spread of Scientific Temper in India

Scientific Temper breeds within the confines of scientific information base, therefore, it is imperative to make relevant scientifically generated latest information available to the common citizen. However, it will be erroneous to equate Scientific Temper with scientific information.

It has been repeatedly observed through survey studies that the thought structure of a common citizen is constituted by scientific as well as extra-scientific spaces. These two mutually exclusive spaces co-exist peacefully. Act of invocation of one or the other is a function of social, political or cultural calling. Those who consider spreading Scientific Temper as their fundamental duty must aim at enlarging the scientific spaces.

We call upon the people of India to be the vanguard of the scientific temper.

Use of religious symbols and ceremonies with religious overtones performed in the garb of cultural activities must be stopped in government offices and institutions run with public funds.

A national monitoring system with powers to issue guidelines must be set up to continually monitor for unscientific content in the media channels and the education system, particularly up to school level.

Scientists and scientific institutions should not only function in a more transparent manner but also reach out to the public at large with an objective to instil confidence in science, scientists and scientific institutions.

A television channel dedicated to the spread of scientific temper should be operated with funding from the government.

Science communication activities mandated in the government agencies should focus more on rationality, inquiry and method apart from content.

India is a stratified country and cultural and religious minorities have special needs. Fundamentalist, unscientific and antiquated ideas are not prevalent only among the religious majority, these are also as rampant among the minority and marginalised sections of people. On

the one hand, similar unscientific beliefs govern the lives of the minority, on the other hand, they are further marginalised because of lack of scientific temper among the majority community. It is necessary to identify their special needs and devise intervention policies.

Every one is born with the Scientific Temper. The child wants to touch, feel, experiment and explore everything on its own—the basic ingredients of Scientific Temper. However, somewhere down the line, owing to societal or traditional influences or due to the type of education being imparted in our schools, the child loses the tendency to ask questions and explore natural phenomena, leading to accept notions forced upon it without putting them through the scientific rigour. Therefore, Scientific Temper needs to be incorporated into the school curriculum at all stages so that the spirit of scientific inquiry can be inculcated from a young age.