

YES, NO, IT'S COMPLICATED

Are we undermining our scientific temper?

YES

Science funding is inadequate and science management is problematic



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There was much angst early this month about the disgraceful remarks that have been over the last few years at the Indian Science Congress (ISC) meetings, to the point where even the organisers felt the need to take a stand. This is unfortunate because the ISC has traditionally been a forum for scientists from all parts of the country to present their work. It is a forum where research that is grounded in rationality has always been given a hearing, even if it did not make it to peer-reviewed journals. The vast majority of Indian educational institutes actively discourage

learning, not to mention research, and the ISC is the only venue where scientists meet their peers and get affirmation of their work. It is truly a shame that a handful have brought disrepute to the entire Indian science community, particularly to those at less favoured institutes who, if nothing else, spread scientific temper through their own actions to the broader community.

Nehru and scientific temper

The broader question to be answered here is whether the nation is undermining its scientific temper. The British understood that

scientific temper would result in a questioning of their rule and preferred to keep their subjects subservient. It was only after Independence that the need for scientific temper was considered to be important. It was even felt that scientific temper should be protected as a fundamental duty. For Jawaharlal Nehru, scientific temper did not mean that everyone had to study science; rather, it was a way of thinking, a way to break the hold of superstitions by applying rationality and thought. Educational structures in independent India were to spearhead the transition of the nation from a people stifled by the medieval darkness of the



British to a people united in the pursuit of knowledge and a search that would bring prosperity in its wake.

Superstitions hold

Unfortunately, the vision of the giants of our freedom struggle founded in a morass of mediocrity. Even those educated in the best institutes in the country never lost their superstitions. They studied modern science, used modern devices, achieved material prosperity and yet held the most regressive views. 'God-men' catering to the educated middle class have used the power of the media and social media to spread their superstitions and broadcast messages that

should have been laughed at by those at the kindergarten level.

It is now not only acceptable but fashionable for public figures to utter scientific nonsense. For instance, the Vice Chancellor of Andhra University, who represents the academics of not just his university but the country, feels no shame in talking about test tube babies in India's ancient history at the ISC. This man holds important roles in the science hierarchy and yet no one in authority finds the necessity to comment on this, let alone punish him. Even the science academies are silent. One may easily conclude that scientific temper is not important to the government and, perhaps even more tellingly, to scientists.

It is hard to know how to reverse this deterioration in scientific temper. While the Chinese are on the far side of the moon, Indians are busy treating cancer with cow urine and looking to the past for modern fighter jets.

Changing facts

Funding for science is inadequate, the management of science is problematic, and the university system has failed. Teaching has become a political game in schools, with facts changing according to the government of the day. A few brave organisations, such as the Breakthrough Science Society (of which I am a part), are trying to break the chains of superstition, but they are lonely voices in the wilderness.

NO

All of India's Prime Ministers have been strong protagonists of science and technology



A. JAYAKUMAR is the secretary general of Vijnana Bharati

From Jawaharlal Nehru to Narendra Modi, India's Prime Ministers have been strong protagonists of science and technology and have believed that the well-being of the common man is vested in scientific temper.

Protagonists of science

Nehru said: "Lots of people may not know, why such an emphasis is being put on science... this may not show immediate results, but will finally result in the upliftment of the country." India's second Prime Minister, Lal Bahadur Shastri, coined

the slogan "Jai Jawan Jai Kisan (hail the soldier, hail the farmer)" after the war with Pakistan in 1965 to enthuse farmers and soldiers for the great task ahead, thus underlining the two core pillars of the nation.

When India successfully tested the nuclear bombs at Pokhran, Prime Minister Atal Bihari Vajpayee declared India a full-fledged nuclear state. In his address, he enunciated his priorities for the nation by adding "Jai Vigyan (hail science)" to "Jai Jawan, Jai Kisan". In this manner, the Indian govern-

ment brought science to the centre of national discourse. Keeping up the legacy, Mr. Modi has also given extraordinary support to science and technology by further adding "Jai Anusandhan (hail research)" to the slogan.

India is among the top 10 countries for scientific research, according to data released by Elsevier, a publisher of scientific articles and journals. There have been many indigenous programmes in scientific research. In space missions, India is counted among the top six in the world.

India cannot undermine the



dreams of 1.3 billion people, which can only be realised through science. Both *Apara Vidya*, or knowledge of the intellect, and *Para Vidya*, or higher knowledge, are inseparably embedded in the Indian psyche.

Science is for humanity

Science has always been universal and neutral. Pseudo-intellectuals and people with unscientific beliefs masquerade as scientists to undermine Indian science. My opinion is that we should never burden our *puranas* and religious stories with India's scientific achievements.

Both have their own destinies and realms to fulfil. Aryabhata invented his astronomical theorems without the help of any modern instruments 1,500 years ago, which scientists were able to unravel with advanced equipment only in recent times.

India's greatest slogan, *Vasudhaiva Kutumbakam* (the world is one family), which is engraved in the central hall of Parliament, calls for acceptance and respectful coexistence. Keeping up with our traditions, the Indian scientific community should declare that science is for humanity, and should avoid looking at science through the prism of religion and beliefs.

At the 106th Indian Science Congress, instead of focusing on the research findings of the three Nobel laureates, Avram Henshko, F. Duncan M. Haldane, and Thomas Christian Südhof, the media focussed on unimportant issues. The space for reporting their promising and positive thoughts was consumed by reports on the Kauravas and their "connection with stem cells" and the "missile technology of Lord Vishnu".

India will definitely march ahead with scientific vigour, indomitable courage and technology in the years to come. The legacy of science and scientific temper can never be undermined in India.

IT'S COMPLICATED

Public rationality has to be ethical and humanitarian



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The answer is complicated because the terms in the question are themselves ambiguous.

Three ambiguous terms

The first ambiguous term is 'scientific temper'. While much has been made of it, there is no clear definition of what scientific temper is. It may broadly refer to a scientific disposition (a way of knowing something), but that is a problem since ways of knowing in different sciences are quite different. For instance, the methods in physics, chemistry, biology, the medical sciences and

engineering sciences are quite different. The scientific attitude in the 'social sciences' also has different characteristics from the scientific attitude in the physical and mathematical sciences. So which of these types of scientific temper are being undermined today?

The second ambiguous term is 'we'. Who is this 'we'? If it includes all the citizens of the country, then we could ask: why should all citizens possess scientific temper? And who are the people who actually possess scientific temper? It could be scientists but surely it does not

include all scientists in all their interactions with their family, colleagues and society?

The third ambiguous term is the word 'undermining'. What exactly is being undermined? If all the citizens had some notion of scientific temper, then we can understand whether it is getting undermined today for various reasons. But we do not even know who has scientific temper, nor do we know how it manifests in their interactions. So what is really getting undermined? And if people do possess scientific temper, is it so easy to undermine it? One could argue that if one possesses scientific temper,



then it is not so easy to undermine it because its nature is such that it will not be easily swayed.

Human truths cannot be reduced to matters of evidence and arguments alone. For example, even the tests show a child to be lacking in some cognitive skills, it would not be correct to call the child an 'idiot'. Human and cultural truths need mediation of ethical values such as compassion and respect. The lack of these in scientific temper is what undermines it firstly.

What is public rationality?

On the other hand, it is important to have something similar to scientific temper in our public discourse.

It is important to realise that public rationality – the ways by which we can discuss and dispute public matters in a public manner – needs some codes of conduct. For example, using anger to influence a position, or holding on to a view independent of what others say, or what the evidence points to are some examples of what we should not do. To be dispassionate about arguments that might be critical of one's position or privilege is necessary. Being dispassionate, taking into account insights and information from different sources, and following an argument to its end even though its conclusions may not be pleasing to one are all characteris-

tics of public rationality. If some scientists mistakenly want to call it scientific temper, thereby negating other influences on this attitude, then they are using this term in an ideological manner.

The reason I resist the reduction of these characteristics to scientific temper is that a scientific attitude has an intrinsic problem with ethical and humanitarian values. Public rationality is one that has to be ethical and humanitarian since it is about decisions and relationship with other humans. We need this larger public rationality, which draws on some ideas of scientific attitude as well as those derived from the practices of philosophy, literature, social studies and the arts.

SINGLE FILE

Checks and balances

Granting more power to the States and limiting those of the Centre could threaten the unity of India

UDAY BALAKRISHNAN



As Gujarat Chief Minister, Narendra Modi often complained that the Central government was sitting too heavily on the States. Recently, West Bengal Chief Minister Mamata Banerjee alleged that "India's federal structure is being bulldozed by the unilateral, arbitrary action of the Centre."

Ms. Banerjee has often espoused the idea that the powers of the Central government should be limited to a few areas like external affairs and defence. Muhammad Ali Jinnah too had wanted it that way. It was something which the Congress along with communal electorates, had quite rightly rejected, paving the way for Partition in 1947.

Promoting the federal idea now, merely to counter Mr. Modi, will be disastrous. Any more power to the States would mean making Central authority weaker. It is in India holding itself together that its constituent parts have the most to gain – a big common market with the free movement of labour, for instance. Realising this, even large regional parties like the DMK and the RJD, while not ready to cede power on home ground, have shown a strong preference for a Congress-led coalition to replace the Modi-led NDA.

Constitutionally, India is a Union, not a federation, of States with a Central government empowered to intervene in State affairs in several ways and even split them. There is an unstated bias in the Constitution for national-level parties to run the Central government. Non-Congress, non-BJP parties have held power at the Centre for less than five of the 71 years since Independence. The first of these in 1977 lasted a mere two years and 126 days; the others did not last even a year. It is obvious that the country could see off threats and achieve significant all-round progress only under firm Central control with parties having a pan-India appeal in power, by themselves, or as the strongest constituents of coalitions at the Centre. The most dismal periods were when squabbling coalitions ran the Central government.

Although India is not a federation, the country's Constitution has, in the Rajya Sabha, ensured a strong forum for the States. It is a tribute to this institution that the NDA, despite having an overwhelming majority in the Lok Sabha, has not been allowed to have its way all the time. Added to this, the Constitution also created a powerful Supreme Court that checks the Central government from arbitrary exercise of its authority. This is about as far as India can go and yet expect to stay together.

As Prime Minister, Jawaharlal Nehru most feared the "fissiparous tendencies" that could break India. It was to safeguard against such a possibility that he ensured the Constitution stopped well short of casting India as a federation. Time has shown how right he was.

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DATA POINT

A ticket to cleanliness

Duronto trains are the least clean among premium trains, while Tejas and Shatabdi trains are the cleanest, according to IRCTC's Trains Cleanliness Survey. Trains operated by Southern Railway are rated the cleanest, while North Central Railway's trains are the least clean. By Varun B. Krishnan

Methodology | The IRCTC survey ranks 209 trains. Feedback was received from 15,360 passengers

Each train is scored on a total of 1,000. Equal weightage of 33% is given to process evaluation, direct observation and passenger feedback. The first two form the cleanliness score

Premium trains outperform | Despite Duronto trains being above average on the cleanliness score, passengers rated them as low as they rated inter-city trains. This indicates higher expectations among passengers

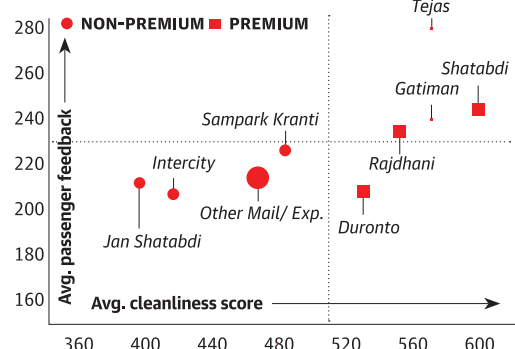


Table shows % of trains in that zone which are classified under that header. For instance, 50% of Eastern Railway (ER) trains are cleaner and received better feedback

Expectations factor | For trains operating in certain zones, the cleanliness score was higher, but their overall rating was pulled down by bad customer feedback (eg. Northern Rly). This indicates higher expectations of cleanliness from passengers. In some zones, cleanliness was low, but their overall rating improved because of customers rating the trains well (eg. West Central Rly)

Zone* (No. of trains, average score ^a)	Cleaner, better feedback	Cleaner, poorer feedback	Less clean, better feedback	Less clean, poorer feedback
SR (13,772)	55.6%	16.7%	11.1%	16.7%
NWR (5,761)	40	20	0	40
ER (14,758)	50	14.3	28.6	7.1
WR (23,754)	43.5	13	26.1	17.4
ECoR (12,754)	41.7	0	25	33.3
SWR (11,751)	27.3	9.1	45.5	18.2
NR (44,735)	38.6	38.6	11.4	11.4
CR (13,722)	38.5	15.4	30.8	15.4
SECR (5,721)	20	0	40	40
NFR (11,709)	27.3	27.3	0	45.5
ECR (9,696)	11.1	0	33.3	55.6
SER (14,694)	35.7	7.1	21.4	35.7
NER (7,688)	0	28.6	14.3	57.1
SCR (12,673)	25	33.3	16.7	25
WCR (8,673)	12.5	0	50	37.5
NCR (3,658)	33.3	0	0	66.7

*W-Western, E-Eastern, N-Northern, C-Central, S-Southern, ECoR-East Coast Railway; full list available at: <https://bit.ly/2REW76s> | # Avg. of premium, non-premium trains

FROM The Hindu ARCHIVES

FIFTY YEARS AGO JANUARY 25, 1969

Controversy over Kerala land bill resolved

The controversy between the Centre and Kerala over the Kerala Land Reforms (Amendment) Bill and the Kerala Stay of Eviction Proceedings (Amendment) Bill has been resolved. This was announced to-day [Jan. 24] by Mrs. K.R. Gowri, Kerala Revenue Minister, after her meeting with the Union Home Minister, Mr. Y.B. Chavan, in New Delhi. The Centre's concurrence to the Stay of Eviction Proceedings Bill is already on its way to the State Government. In the case of the Land Reforms Bill, the concurrence would be sent to the Kerala Government in two or three days. In the case of the Land Reforms Bill, Mrs. Gowri said the Centre had given up its demand for reservation of 20 per cent of the plantation area for further expansion.

A HUNDRED YEARS AGO JANUARY 25, 1919

Women's Education.

Presiding this evening [Jan. 24] at the prize distribution of the United Free Church of Scotland Mission Girl Schools [in Calcutta], His Excellency Lord Ronaldshay said that the movement in favour of women's education was fast gathering strength. During the quinquennium ending with 1916-17 the number of public schools for girls increased in Bengal from 6957 to 9520 and the number of girl pupils under instruction from 222,576 to 285,398. His Excellency pointed out that it must be perfectly obvious to every impartial observer that the curriculum which included such subjects as hygiene, nursing, needlework, cookery and domestic work must be of far greater practical value to Indian girls than a curriculum designed with a single eye upon Matriculation examination, but it must be equally obvious to any moderately observant person that Matriculation certificate in Bengal had acquired so extraordinary and so fictitious a value in the eyes of the people that it was difficult to persuade them to adopt what is obviously a more rational course.

CONCEPTUAL

Uncanny valley

PSYCHOLOGY

This refers to the feeling of revulsion that many human beings feel when they interact with humanoid robots that are designed to closely resemble them. The feeling of unease is linked to the unrealistic nature of such robots which fail to perfectly ape the physical and behavioural characteristics of human beings. It is believed that the revulsion may be a natural reaction of the human brain in order to avoid unsuitable mates. Robots that can look and behave perfectly like human beings, however, may not cause unsettling feelings in human beings that interact with them. The idea was proposed in a 1970 article by Japanese roboticist Masahiro Mori.

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