

*The Scientific Temper*

National Science Day Lecture

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I am sincerely grateful to Dr Ramaswami, to the DST, JNU and to the organizers of this lecture, for the high honour done to me by the invitation to give this year's lecture in the distinguished series of national science day lectures.

For one like me to speak to this audience on fostering the scientific temper or, indeed, on any matter pertaining to the world of science is, basically, implausible. It is as implausible as all or any of the following:

Raj Kapoor speaking on Advaita.

Swami Ranganathananda speaking on Raj Kapoor.

Mukesh Ambani on the merits of simple living.

Anna Hazare on the pleasures of life in Antilla, the Ambani palace.

Narayan Murti on the advantages of a computer-less world.

Prakash Karat on the virtues of religious devotion.

Sunny Leone on the indispensability of clothing.

Arnab Goswami on the art of breathing slowly, speaking softly and keeping one's hands folded.

Finance Minister P Chidambaram on the criticality of Hindi in our nation's life.

Sushri Uma Bharti on the beauty of ancient Tamil.

Sri Narendra Modi on the greatness of Iqbal's poetry.

Sri L K Advani on laughter.

Navjot Sidhu on seriousness.

Mani Shankar Aiyar on the maxim 'think before you speak'.

Our esteemed Prime Minister, Dr Manmohan Singh, on the great gains to be had from shouting oneself hoarse in parliament.

I could go on, but that is not really necessary. The oddity, the incongruity and, indeed, the irony of one who has had nothing to do with science or even with the spread of science awareness in our country, speaking on the eve of National Science Day, on fostering the scientific temper, is obvious. I will ascribe this out-of-jointness to the general disjointedness of our times, the appropriation of opportunities, including those of public speaking, by image rather than merit, by reputation rather than by credentials, by name rather than by qualifications.

Let me, therefore, say straightaway, that I will speak about the theme as an observer of scientists, which excludes me, and of society, which includes me. In other words about that which is to become a 'temper', and that which it is to become the 'temper' of.

### *Three fallacies*

Before I do so, in the thirty or so minutes given to me, let me say by way of a preamble that Jawaharlal Nehru's insightful and even, lyrical, introduction in our vocabulary of the phrase 'scientific temper' has, in my view, led to three fallacious presuppositions. These are not Nehru's presuppositions, but those of the people – us – who use that phrase uncritically. Let me explain these.

First, that 'science' is not part of our inherent nature and that we, as a people, are a-scientific and that we need to be helped by science and scientists somewhat like early Christian missionaries helped 'heathen' communities to be initiated into and saved by the redemptive touch of the Gospel.

Second, that science has, somehow, to be introduced into our unwilling systems, like a polio drop into a screaming baby's throat.

Third, that when that is done, *Hey Presto!* we will become a different people, a new people.

Put differently, these three presuppositions believe the scientific temper to be (1) testamentary, (2) prophylactic and, therefore, (3) transformational. None of that is right.

A scientific temper is as intrinsic to us as, say, a short temper is or an equanimous temper. We are not born superstitious, cruel or bigoted. We are born with tendencies to logic, to reason, to civilized behaviour, even compassion. These tendencies are not only compatible with what can

be called the scientific spirit. Infants do get angry. There is a famous sculpture by Vigeland called 'Angry Child', in Oslo. But bouts of anger and tears in a child are need-specific, are substitutes for the vocabulary of articulation, and are in any case short-lived. The equable child, the child to whom things can be explained, is the child that we know.

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Losing one's temper in adulthood is another proposition altogether. And that is when the scientific temper comes into play, corrective play. Nelson Mandela has told us how to lose one's temper is common but to use one's temper, the temper that can go wrong, for rage and anger, in a controlled fashion, is wise. To yell, to lash out, with words or action he has said, is to respond from a weakened, debilitated condition. But to rise above rage, and to transmute that rage into a highly reasoned, sharp and pointed retort, forcefully and yet without the voltage of temper, is to use the propensity of anger, of rage, intelligently and scientifically, and far more fruitfully.

General Dyer's action in Jallianwala Bagh in 1919 used technology, the technology of ballistics. But his action did not reflect the scientific temper. It reflected racist, imperial, prejudice and utter, blinding, arrogance. Gandhi, on the other hand, by retaliating with a satyagrahic nationwide hartal, used no technology and yet, he used the scientific temper, a highly rational understanding of the psychology of the then rulers and the then ruled. And what he proposed to the nation appealed to the whole nation and to what might be called its inherently rational, scientific temper.

All of us have a scientific temper, as much as we have a conscience. And as with conscience, the scientific temper has to be jolted into action, and we need to be reminded that it exists, albeit as a latency, and be encouraged and exhorted to use it.

#### *Observing scientists or those whose 'temper' is to be fostered*

The scientific temper is, therefore, not a medicament of import, not some rare formula, some abracadabra, to be administered to our old, bent and recalcitrant bodies for our salvation. A scientific temper is no secret formula. But some members of the science community seem to think they belong to a secret league. If religious orthodoxies, political oligarchies and institutional groupings like the Freemasons have their closed rooms, their inner chambers of secret learning, secret planning and secret decision-making, science communities are not entirely open. Because of the highly specialized nature of scientific investigations, the need for seclusion and cloistering in scientific research organizations and because of the fact the language of science literature is necessarily tight and laden with its own internal terminologies, science is of the essence of aloofness.

Scientific knowledge, by its very nature, grows best when it grows in conditions of quiet, of seclusion, in a state of voluntary exile from the bustle of the world, in self-banishment, if you like, and in some measure of dis-sociability. A serious researcher in science must be a recluse, even a hermit. This much he or she shares with the rishi : a hermitage is required, a cave or grotto of silence in which a scientific idea must gestate with experiments.

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To borrow from the cadences of William Blake, science must research with creativity in a pipette, productivity in a goblet. The science researcher must hold the universe in a chalice, an atom in the void. And in order to be able to do so, she or he must, for a while, live in some estrangement from the world of life's daily transactions, in sequestration, even solitariness, if only to be able to return to the world with its newly researched gift for the world. The scientist has to be 'the world forgetting, by the world forgot', until the task is done.

This voluntary ex-communication inevitably leads to serious inter-communication between scientists and, to a lesser extent, technologists, among and with each other. This in turn breeds a homochromous, homogamous, homotypic mutuality between them and to rise of a science Order, with its own homomorphic, homophonous homotony. It leads to science clubbism.

Here lies a paradox. The more advanced the science, the more exclusive it becomes. The more exclusive the scientific temper gets in its higher reaches, the more distanced it gets from the terrain of the people's scientific temper. And, over time, that terrain gets encroached upon and populated by the opposite numbers of the scientific temper. When science cloisters itself, quacks advance and confusion results. Superstition is not the progeny of confusion ; it is the pupil of the absentee teacher called science neglect.

A word about superstition would be apt here. Superstition and the scientific spirit are poles apart. Superstitious people can be atavistically conceited about science. We may let them do so. But the science community cannot afford to be dismissive about superstition. It may dislike, even despise superstition. But it should not dismiss superstitious beliefs. That would not be a sign of the scientific temper. It should want to understand the origins and the reasons of superstitious belief, the impact of those beliefs and the ramifications of those on human behaviour. Through the tools of anthropology, sociology and psychology, it should try to get under the skin of superstition if only to be able to better counter it.

If unscientific purblindness has its tendentious ways, so does scientific tendentiousness.

If religious orders have their priesthoods, political groupings their cabals, corporates their closed board-rooms, science has its own abbeys and monasteries, each with their very powerful abbots and monks. These are not unlike members of some esoteric order and though they do not wear

regulation dresses they do wear a seriousness of endeavour , of a joint and, not un-often, classified purpose and a very big and formidable one on which the fates of millions hang. Priests speak Sanskrit, Moulvis are masters of Persian or Arabic. Scientists speak Scientese. They cannot be blamed, for that is the language they have learnt their science in.

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But somewhere , like the religious divines, they too become nearer Divinity called Science than the people they belong to. And something of that Divinity drops its stardust on them, marking them out from those who bear plainer dust.

I cannot but recall here that, in the afterglow of the first atomic test at New Mexico on 16 July, 1945, Richard Oppenheimer quoted the Bhagavad Gita to say “I am now become Death, the destroyer of the world”. That – Death – is no ordinary self-identification. Twenty years later, In 1965, Oppenheimer recalled the ball of fire in a television broadcast: “We knew the world would not be the same. A few people laughed, a few people cried. Most people were silent. I remembered the line from the Hindu scripture, the *Bhagavad Gita*; Vishnu is trying to persuade the Prince that he should do his duty and, to impress him, takes on his multi-armed form and says, 'Now I am become Death, the destroyer of worlds.' I suppose we all thought that, one way or another”.

The “we” in that quotation is important. Scientists , a great and unique community, are “we” thinking that “one way or another” they are doing their duty by “them”. The global connect between science research and the fabrication of armaments has made what would have been no more than a necessary seclusion don a hood of sinister secrecy.

I am reminded of Freemasonry, the hoary organization, which has over the generations carried something of a Grand Secret.

We have all heard of the 123 Agreement. Try as it might, the science community in India and the nuclear community in particular cannot persuade us that there is no secret clause tucked away somewhere within the folds of that 123 Agreement. There may not be any such thing, but the perception is there. Perceptions can be unreal but the fact of the perception being there is real.

There is a poem, a nursery rhyme, really, without a known authorship. It goes:

*We have a secret, just we three*

*The robin and I and the sweet cherry tree*

*The bird told the tree and the tree told me*

*And nobody knows it but just us three.*

A secret, any secret, binds the holders of the secret together, includes them in its tight knot. A secret, every secret, excludes those who are not admitted into its hidden world. Therefore, a secret also acquires the airs of a mystery.

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At the risk of sounding digressive, let me return awhile to Freemasonry. This institution has lived with an air of mystery surrounding it. I may even say it has thrived on it. Its Lodges have been the object of speculation, if not awe. Its meetings are believed to be conducted with ceremonies that others can comprehend neither the meanings of, nor purport. There is something esoteric about the popularly held image of Freemasonry.

To a lesser extent The Theosophical Society of Chennai also has had an air of mystery surrounding it. I might mention here that Pandit Motilal Nehru was a Freemason and the young Pandit Jawaharlal Nehru had been initiated into the Theosophical Society. Like the Freemasons, the Theosophists also have 'Lodges', which have to non-Masons and non-Theosophists have signified something a trifle mysterious.

The myths of Freemasonry and those associated with Theosophy are myths, which bewilder non-Masons and perhaps give Masons a sense of self-importance, rather like some school boy who refuses to divulge to another the contents of his small pocket which is quite empty.

There has been and there continues to be a danger of science laboratories becoming, like the 'Lodges' that I mentioned, so removed from the natural understanding of people as to become venues of wonderment, of awe, not without respect, but without a bond, beyond their grasp.

The people of India have a bonding with social institutions, cultural institutions and, needless to say, with religious institutions. They bond with teachers, with mentors. Laboratories and the great science installations of our country like our reactors are the science equivalents of our great shrines, schools and colleges in appearance alone. In their inner nature, they are quite different. They are not regarded as 'unknown' or *agyat*, but as unknowable, *agyeya*.

The 'fault' lies partly in the continuing intellectual non-exertion of those that I described as 'Peoplehood of India' but also in the continuing intellectual seclusion of the science community. Of the holy priest, it has been said that he holds the Divine Secret in his closed fist, his *gyana-mushti*. Time has come for the scientist to open his *vigyana-mushti*. We cannot be in awe of that closed fist. We have to see it open, see what it contains, befriend it. The beneficiaries of the scientist's knowledge cannot be content with the knowledge that the scientist knows. They must know what he knows, in their own way, in their own time but know they must. Only in dictatorships or in theocracies can the people be relegated to the darkness of un-knowing.

We are neither a dictatorship nor a theocracy – not yet – and so we must have the light of knowledge. By this I do not mean we must attend nominal, tokenistic or do-gooding science awareness programmes, read science journals, science pages in newspapers, have *Lancet*, *Nature*, *Science Today* translated and delivered in our mother tongues at our doorsteps or read them on-line. All these steps will have their value. What I mean is something different.

Let me explain that through the analogy of ‘darkness’ and ‘light’. Darkness is often spoken of in association with sightlessness or blindness. And light is invariably spoken of in terms of knowledge, wisdom or *jnana*. Now, it is of course true that as with pitch darkness, blindness cannot see. But the glare of light is also blinding. The glare of scientific knowledge and pride in that knowledge can blind us to many ground realities, overlooking them. This would be unscientific.

One of the things that the glare of science blinds us to is the wall around science.

Our science community must assiduously dismantle the mystic wall between itself and science policy, which is half-sister to defence policy. It must not only be available for a continuing dialogue with society, with those who must have a scientific temper, but it must tell the makers of public policy, namely, the political forces in power, that science, is part of the nation’s ambience, and must be available free and fleet to those who want it, need it, and to those who do not know they need it.

There can be no fostering of the scientific temper as long as science stays flaked, masked and tasked by secret propulsions. Science, in order to breathe needs R&D. R&D in order to survive needs money. And since no one has as much money as the King, science has allied itself to the State, inextricably. Science, which is a ‘har ghar ki beti’, has become a Rajkumari, whose requirement for money is insatiable. The more she needs money, the more she gets and the more she gets enmeshed in her palace-prison.

Science and science policy and government are now inseparable. This is fatal to the fostering of the scientific spirit. There is and should be a science wisdom which nurtures the scientific spirit outside of government or any control. If there can be many views, many approaches, many wisdoms about economics, beyond the Ministry of Finance or the Planning Commission, why can that not be the case with science policy, science perspectives, science wisdoms? As long as science and science policy remain a State ‘matter’, so long will the fostering of a scientific temper remain a government document, cold, distant and impersonal.

There is, let us not be coy about admitting it, a cobalt coldness to the word ‘science’ as we know it in India today. There is in that name the touch of passionless, zeal-less, spiritless absence of warmth, a chill that dampens all interest, discourages contact.

Where science should embrace life in India, it offers it a distance nod. Where it should take India by the hand, it seems to give it a website link. Science is as yet perceived as a *sahib*, not a

*bandhu*, a *mahapandit*, not a *hum-zuban*. A line from a Hindi film song comes to mind ... 'ghar na bulata par yah to kahta kuchh dur tak sang chalo...'

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Today, science is seen as an SEZ, a privileged area, gated and cordoned, with high security walls, guns pointing outwards, where none may question, none judge the benefits to us, outside it. Naturally, this militates against a scientific temper being fostered. This is singularly unfortunate because science has worked wonders for us, reduced drudgery, enhanced ergonomic ease, improved productivity on farm and fishing fields, saved lives like that of fishermen out at sea who, thanks to satellite warnings, can turn back when the weather grumbles into a storm or rages into a cyclone. It was science, coupled with quick administrative reflexes that saved Odisha from a human catastrophe of unknown dimensions when a cyclone hit its coastal districts end of last year. In 1999, as many as 15,000 persons died of a similar cyclone in the same region. In the latest cyclone-management, we saw science at work, a science-propelled administration at work, not India's corporate giants or its political behemoths.

Mahadevi Verma, the great Chhayavadi poet, for whom, incidentally, Jawaharlal Nehru had high regard, wrote '*Hum ek prakar se do yugon mein ji rahe hein. Ek yug to Madhya yug, aur ek yug naye vigyan ka yug. Hamara ek Aryabhata akash mein ur raha hai. Aur asankhya jan dharti par chalne mein bhi asamarth hein. Hamari adbhikansh janata sarak ke kinare bina chhaya ke, bina bhojan ke, bina vastra ke, janm leti hai, marti hai...*'

The writer U R Anantamurthy has also said that India lives simultaneously in many centuries. Undoubtedly, this is a major challenge, the burden of which becomes more acute in the era of 'big science' where technological progress is increasingly predicated on larger financial investments and ever increasing sophistication. *Bachchan-ji ne apni 'Madhushala' ke bare mein likha hai 'Din ko holi, raat Divali roz manati Madhushala'. Yah hamari Vigyanshalaon ke bare mein socha jata hai.*

I do believe that this misimpression and the disconnect that lies behind it, needs to be addressed by Indian science taking the people of India into confidence about, for instance, a) the nature and scale of the ecological crisis that looms before us and its implications for society at large, especially the poor and b) the need to turn some attention away from the glamour of 'big science' to more mundane problems that have immense consequences. I believe that the primary responsibility for educating us, the people of India, about what awaits us, at its very minimum, as a result of climate change, rests with the science community. The trouble is that the science community feels it can speak to the people of India only through the Government. If a scientist speaks to the people directly, he or she is almost committing heresy. Why should this be so? Are scientists bonded slaves of the government of the day? Do they need permission to speak? Are they under some oath of secrecy? Not in this day and age of RTI, surely!



The people of India, six decades after Independence , are mature enough to take frank spaking from scientists, difference among scientists, even rdical difference among them. If we can hear with equanimity Amartya Sen and Jagdish Bhagwati prescribing radical political-economic medicament , why can we not hear our leading scientists do the same ?

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In fact, do we even know the voices of our scientists ? We do not. We know and can recognize the voices of our politicians, our intellectuals, and of course, of our mediapersons. But do we recognize the voices of our great scientists ? We would not be able to place their names to their faces or their voices to their faces. We hear of them when they get the Bhatnagar Award, the Padma Award and the Bharat Ratna. For the rest of the time, for the rest of India, India's scientists are India's best-kept secret. And the 'beauty' is that the science community is to blame for this. It is not self-effacing modesty but a kind of intellectual self-consciousness verging to timidity that causes this.

I would like to hear a Bhatnagar awardee tell us, face to face, not through some minister or bureaucrat, that our glaciers are in fact shrinking alarmingly, that our rivers are getting drier and muddier than they ever have, that our water-table is sinking, that our top soil is evaporating, that arsenic is seeping into large chunks of the gangetic belt, our forests are losing their shape, that our monsoons, if they fail three years in a row, can bring all life to a halt. And , perhaps, most importantly, that the greatest, perhaps the mother of all earthquakes, is now due, in fact, due in the Himalaya. And that we are utterly, and criminally, unprepared for it.

I would like a scientist to tell us, for that would be about scientific temper, that it is fatally wrong for India's national capital to be located in a high seismic risk zone, with a nuclear plant right next to it. I would like another Bhatnagar awardee , or a Padma decorated scientist to ask why, if South Africa without any known seismic dangers, can have three capitals, Cape Town for its parliament, Pretoria for its Government offices, Bloemfontein for its Supreme Court, India must have all three crowded into an earthquake-prone spot ? Only a scientist can tell us, that the scientific temper requires us to rethink our science smugness. And only another scientist can controvert the first scientist, with contrary facts and figures drawn from and for science's greater glory, not from and for Bharat Sarkar's greater glory. We need to hear science jugalbandis. We only hear science dhrupads, singing the dhruva pad, unvaryingly pinnaced on the same svara. Science in India believes in eka-raga, the raga Darbari set to ek-tal. Scientists must question science policy scientifically. Their questioning science policy can be mistaken ; it cannot amount to committing treason.

*Observing ourselves, the people who need the scientific temper*

The Mahatma is quoted, misquoted, all the time. To me, the most pertinent quote of the Mahatma is from Hind Swaraj ( 1909): ‘We do not know the people in whose name we speak; and they do not know us’. That can be said of India’s scientists and of the Peoplehood of India. This has to change. We need a scientific temper to permeate us not because we will, thereby, become more congenial to the science community but because that is a desirable temper to have. Scientists, not governments, must help spread that temper.

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Where scientists must go beyond the closed doors of research to educate us is, I believe, about these many challenges before the Nationhood of India, where a scientific temper as opposed to other tempers and distempers , can help as only it can. Terrorism using scientific and technological tools, communalism erupting in inter-religious riots , using un-scientific genetic arguments, are to be countered by the scientific temper. Scientists must speak out about these.

Take the Parliament of India. Do not get scared, I am going to say nothing that will bring this lecture series into trouble with that August body and its set of privileges. If you were to see the wrists and palms of the members of the first Lok Sabha, including those of the first Prime Minister, Jawaharlal Nehru, you will find they were as nature had made them. That is, they were unadorned or, shall I say, un-fettered, by rings and strings.

Look at the fingers and wrists of MPs today, you will find rings on almost all fingers, strings on both wrists, red and yellow. And this would be true of MPs from all parties, barring, I must say, the communists. So, has the scientific temper grown or shrunk ?

Our science community must speak out about superstition, about witchcraft, about sorcery. But will it ? It is, after all, in *mauna*.

Political leaders may try, social activists might strive, opinion-makers and media might attempt to propose much-needed thought-style and life-style changes. But it is only scientists and technologists who, if they speak like fellow-citizens and not as rarefied beings, that can propose those changes from the vantage of empirical understanding. They more than others have the professional right, the intellectual right, the moral right but more, the pedagogical duty, to enable us to see the following:

The scientific temper is not about being a geek.

To be intelligent in the way precious and depleting resources should be used and intelligent about how they should not be used, is not about ecological wisdom alone ; it is to have a scientific temper.

To conserve and not waste water and electricity, to use those resources optimally, even thriftily, and to recycle what can be re-used, to not pollute , to not litter, enfold, defile, is not about austerity alone ; it is to have a scientific temper.

To be sensitive and not callous to the circumstances, mostly physical and material, that leads Indian farmers to commit suicide, in the world's only such phenomenon, and to do something about it, is not just about being rightly shocked ; it is to have a scientific temper.

To keep a weather-eye open to the phenomenon of climate change, to change prodigal ways, is not about responding to Dr R K Pachauri alone ; it is to have a scientific temper.

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And taking simple things – to not scratch one's name on the walls of monuments, to not leave a toilet spotty, smelly or wet, to not speak louder than needed, to be tolerant of others' opinions, to contradict with civility, concur with grace, to acknowledge with generosity, to not plagiarise, to not distort, to not denigrate, is to have a scientific temper.

To keep one's faith in a Creator and not make it an article of flamboyant exhibitionism, to not just be receptive but welcoming of other faiths including agnosticism and atheism, is to have a scientific temper.

Courtesy, considerateness, compassion and matters of conscience are not about a scientific temper but activating them, choosing the best method of putting those to practical account, invokes the scientific temper.

When Gandhi put a maggot-infested cat and a suffering heifer to sleep with his own hands, he was being compassionate but with scientific temper. When we perpetuate the lives of aged or sick animals mindlessly we are mistaken on our compassion, we are unscientific. When we kill other beings for food, I believe, we are being unethical. That is my personal view, that of an intellectually convinced vegetarian. But when we kill animals in abattoirs with some sense of their dignity, inflicting the least pain, we are reflecting a scientific temper. When even vegetarians cause pain to bullocks and cows to increase their draught power or their milch yield they are being cruel and unscientific.

No one with a scientific temper would allow himself to be cruel.

I will end with a topical thought.

Not every example of a scientific temper is edifying.

Elections are at hand. I have heard of scientific rigging. There a a higher scientific temper, that of the scientific preventer of scientific rigging must come into play.

The co-opting of scientific and technological tools by terrorists and communal hate-vendors is not an activity of the scientific temper but of scientific cunning.

Above all, a scientific temper is equitable, equanimous.

Only a mind utterly uninfluenced by scientific reasoning would be communal. A man may be a business wizard, a technological giant, a political genius. But if he is communal, bigoted, racist, he is not only devoid of scientific temper but of human feelings.

And that is where science and the intrinsically scientific temper of humanity intersect.

To have a scientific temper is to be civil and civilised.

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To have a scientific temper is to be able to ask:

If our politicians are corrupt, who corrupts them? If our bureaucracy is feudal, who feudalises it? If our minorities, whether Hindus in Muslim majority areas or Muslims in Hindu majority areas, Sikhs in either of those, are self-conscious if not scared, who lets fear prevail? When Sikhs were butchered in Delhi in 1984 I know that many Hindus helped them? But many more did not. When Muslims were killed like flies in Gujarat in 2002, many Hindus rushed to their help. But many more could have. Have the Pandits who have had to flee the Valley of Kashmir been given the sense of assurance from the Muslim majority that they needed? When terrorists bomb and shoot innocents, without any sanction, in the name of Quranic injunctions, do enough Muslims condemn the outrage? I know many who do, at huge risk to themselves, but many refrain for fear of extremists' rage and many who rush to do so, for fear of Hindu wrath. This is where in our society the scientific temper takes a back seat. Who but scientists can help the scientific temper take the driver's seat?

Am I not meant to do better?

If I ask myself that question, I have a scientific temper. If I do not, I have a Madhya yug temper.

A scientific temper is a mixture or balance of qualities, a state of mind, a disposition, that pre-exists in us, like in any people, to be strengthened, to be utilized, to be deployed as situations warrant. It cannot be fostered by scientists alone but it cannot be fostered without them breaking their *mauna*.

*Conclusion*

I will end by saying our scientists are the salt of the earth, but they are constantly on the lookout for the bland dish into which they can snuggle un-seen, un-smelt and only incidentally, if at all,

tasted. They are afraid to be found to be too little, and thereby to be found wanting, or too much, thereby to be found too assertive.

They are the world's most bold experimenters, but among the world's most reticent articulators. They have the knowledge, the wisdom, the insight. But they are under some self-imposed stupefaction.

Bold and yet hesitant, brilliant and yet subservient, ahead of their times, and yet behind their own will-power and goals, they need to free themselves from the silken constriction of governmental patronage to play the role they are meant to play.

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