

A statement on Scientific Temper signed by outstanding intellectuals, released by P.N. Haksar at the Nehru Centre in Bombay (*Mainstream*, July 25, 1981) has touched off rethinking in a broad spectrum of our national life. Four comments on the Statement have so far been published in *Mainstream* (August 29 and October 10, and November 14, 1981), including a strong critique of the Statement from Dr Ashis Nandy and a rejoinder from Dr Boudhayan Chattopadhyay. We publish here two contributions, one by a scholar and the other by a CPM leader of Punjab. The discussion continues. —Editor

## Myth of Scientific Method

VANDANA SHIVA

SOME leading scientists, both natural and social, have rediscovered a myth called "scientific temper" the lack of which is presumed to be the central reason for the backwardness of the Indian people. Such a fundamental yet easy description of India's backwardness would have called for a lot of attention had not philosophers of science all over the world adequately demolished the idea of "scientific method" on which the myth of "scientific temper" is based. Such an outrageous claim about the relation of "scientific temper" with economic and technological progress who never presupposed in the development of the industrially advanced countries of Western Europe or North America. In a Third World country with a disproportionately massive investment in scientific enterprise, a fragile, unproductive and uneasy scientific community would obviously try to find the reasons of our failures to use science and technology for development in the myth of "scientific temper", instead of taking a critical look at the scientific activity of the community of scientists in India.

The much-debated statement on "scientific temper" makes three central claims. First, there is a universal and unique method of science leading to knowledge claims which are more valid and more true than those arrived at, by any other method. Secondly, this scientific method can be legitimately and fruitfully extended into the domain of daily life. Thirdly, one should use knowledge gained through the method of science to reject conflicting knowledge claims. When examined critically, these claims reveal the way science becomes an ideology in the Indian context. It has repeatedly been argued that it is only technology and not science which plays an ideological role in society. Due to its inherent universality, it is claimed, science is beyond space, time and ideology.

Boudhayan Chattopadhyay (*Mainstream*, November 14, 1981) repeats this argument to criticise Ashis Nandy's rejoinder (*Mainstream*, October 10, 1981) to the statement on "Scientific Temper," and to give his own defence of the "Scientific Method". Chattopadhyay, however, ignores the close inter-

relationship of science and technology today, since a piece of frontier level contemporary research activity cannot be uniquely given the labels of "scientific" or "technological". Pure physicists like Wigner, Szilard, Fermi were the central figures in the technological project of making the atom bomb. The work of Bardeen and his colleagues in the semi-conductor project of the Bell Laboratory was also recognised as a scientific achievement when they got the Nobel Prize. With most modern technology being intrinsically science-based, it becomes impossible to separate the scientific and technological contents of research; consequently, the argument that science is value-free and technology is the villain doing the dirty job becomes obviously too simplistic.

Chattopadhyay also attempts to defend scientific method by arguing that modern science has transcended the narrow domains of a positivistic method as assumed by Nandy: "The Scientific Method now includes the so-called 'irrational', as it increasingly achieves the capability to situate and analyse 'false consciousness' ... Surely Ashis Nandy cannot be unaware of all this and should concede at least this much of familiarity with the Twentieth Century developments in science to the signatories of the 'Statement on Scientific Temper.'" This statement is a blatant illustration of the ideological character of this proclamation about scientific method.

In spite of calling upon recent sciences and their methodological shifts away from mechanistic and positivistic ideals, Chattopadhyay continues to refer to the "Scientific method", as if it were a unique methodological unit. He fails to see that such uniqueness is inconsistent with the fact that modern science now admits entities such as false consciousness. On the grounds of a positivistic rendering of the scientific method, such unobservable terms and concepts had to be systematically excluded from the domain of discourse of science. What was methodologically illegitimate in science has now become legitimate. Through this Chattopadhyay implicitly accepts that science, like every other enterprise, has had a plurality of approaches

and divergent criteria of justification.

There is no such thing as the singular scientific method. Building an argument for the "scientific temper" on this myth is therefore ideologically laden on one hand and obscurantist on the other. The ideology is strengthened by not merely insisting on the existence of a uniquely identifiable method but extending it to non-scientific domains. The strongest use of the scientific method is to invoke it to reject knowledge-claims in these domains even in cases where such knowledge-claims are later, in a different historical and methodological context, accepted as scientific.

The success of a scientist is constituted by his awareness of the tacit and explicit criteria operative on his professional activity. The criteria of rationality operative outside the professional domain of scientific activity are neither influenced by, nor do they influence, the specific cognitive and technical norms operative within the system of scientific production. The difference between the two systems of rationality does not imply the irrationality of the former. Recognition of this difference clarifies that scientific production takes place in accordance with scientific values, and not on the basis of a 'temper' that is applicable both inside and outside the domain of science.

Consider, again, the concept of "false or altered states of consciousness" that Chattopadhyay refers to. Psychic research that has taken this as a problem area was motivated largely by practices in Oriental cultures with explanation and justification rooted in their own culture-specific knowledge systems. Knowledge-claims related to mind-body unity, the control of physical states by mental states, etc., were earlier rejected by Indian scientists as magical, mystical and unscientific, when success of Indian *yoga* as proof of the validity of such claims was not taken seriously and was identified as obscurantist. Now that the same claim is offered with a stamp of scientificity by research undertaken in the West, they are quickly identified as true and objective.

Such examples of initial rejection and subsequent acceptance of claims in non-scientific domains can be found in every other sphere of modern science, which, directly or through its technological expression, has confronted non-scientific beliefs and

### SCIENCE AND TOLERANCE

Let us go back to ... Asoka's period 2,300 years ago ... Addressing his own people he said, "If you reverence your faith, while you reverence your own faith you shall reverence the faith of others. In reverencing the faith of others, you will exalt your own faith and will get your own faith honoured by others." If you apply that message of tolerance not only to religion but to the other activities of human life such as politics, economics and science, you will find that it puts things in a different context. It is a context which is not very much in evidence today in the world where differences of opinion are not liked, where the tendency is to suppress the view, the opinion, or the way of life that is not approved of, where ultimately science itself becomes vitiated by a narrow outlook.

— Jawaharlal Nehru

practices. Thus scientifically trained doctors persuading Indian mothers that scientists had found "enriched diets" (obviously made by Nestles, Glaxo etc.) for healthier babies and failed to observe their clinical experience that death rate of "milk food" babies was at least five times higher than that of breast-fed ones. Traditional practices as well as their own experience was ignored till research in the West argued in favour of breast-feeding. In due course medical scientists in India will surely start echoing this in the name of science. Meantime, thousands of babies will miss the free nutrition of mother's milk, because the mothers place faith in the 'scientific' training of doctors.

Similarly, the Indian farmer who, for centuries, had practised ecologically sound techniques of mixed and rotation cropping and organic farming, was called ignorant and unproductive when the American research establishment sold the Green Revolution package of monocultures and inorganic fertilisers and pesticides. Today, after wiping out traditional knowledge and practices, agricultural experts with 'scientific' training are telling the Indian farmer to adopt mixed cropping patterns 'discovered' through 'scientific' research.

Supporters of the myth of the scientific method have repeatedly talked of how it leads to progress in science and provides a systematic approach to true claims. The history of contemporary scientific research in India, however, shows, as illustrated by the above examples, that science has often provided an expensive and long process of arriving at truth claims of non-scientific knowledge systems, often at the cost of substantial loss to the people. It cannot be argued that science provides a better justification for these claims because the assessment of what is better can only be provided if an absolute yardstick exists in the form of fixed criteria of justification. The plurality of scientific methodologies has already shown that no such fixed criteria exist.

In the absence of progress at the epistemological level, the belief in progress through science reduces itself to the claim that knowledge becomes more reliable only when it is a product of research in the West. The package sold by the signatories in the garb of "Scientific Temper" therefore amounts to prescriptions to distrust one's own experience and beliefs, not in the Cartesian sense of fruitful doubt, but in the colonial sense of blind faith in Western sources of scientific information. For a group claiming to fight colonialism such an implicit prescription does not even reflect the minimal requirement of consistency in scientific practice. This requirement of consistency is also conspicuously violated when one of the important scientists among the signatories accepts in the statement that "science is universal", while having no problem in writing in one of his recent papers that "there is a distinct possibility of developing-country science being different from developed country science".

Einstein did not in vain caution all of us while referring to the methods used by the scientists when he said "...do not listen to their words, fix your attention to their deeds". □

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respect of most of the post-Independence developments, in prettifying his high "ideals", and making out that all that happened was "despite" his best efforts. It is being glossed over that the class nature of the post-Independence Establishment and the malaise that has reared its head now represent links in the same chain — radical-sounding protestations of mature bourgeois politicians notwithstanding.

Ashis Nandy, in his excessive zeal to dismantle the scientific method, and install one of his own creation in its place, has virtually gone berserk. (*Mainstream*, October 10, 1981). He displays sheer dilettantism when he assumes the air of defending religion in the name of attacking scientific temper. In fact, while doing so, he reduces himself to the level of an apologist for those very vested interests against whom he seems to train his guns, while denigrating science and technology. It is a fact that adherents of scientific socialism have always repudiated opposition to religion from an abstract, anti-clericalist angle. Engels, commenting in 1874 on the famous manifesto of the Blanquist fugitive communards, called their vociferous proclamation of war on religion a 'piece of stupidity'.

Engels condemned Duhring for advocating that religion should be prohibited in a socialist society. To declare such a war on religion, according to Engels, is to "out-Bismarck Bismarck", that is, to repeat in a still more heightened form the folly of Bismarck's struggle against the German Catholic Party by means of police persecution. German social Democracy, according to Lenin, advocated freedom for the Jesuits their admission into Germany, and the complete abandonment of police methods of combating any religion. The Italian Communists, committed to the perspective of scientific socialism, lay emphasis on uniting all anti-monopoly and peace-loving forces, including those among Christian Democrats, for ushering in broadly progressive changes in Italian society. The continued existence of the Church as a powerful institution in Socialist Poland bears eloquent testimony to the same fact.

However, Ashis Nandy's defence of religion, which runs like a red herring throughout his 'statement', stands on an altogether different base, and is patently absurd. It is theoretically untenable, and practically an attempt to cover up and varnish a morbid reality. He deliberately evades the question most pertinent to the issue under discussion: the social essence of religion. It is fear and uncertainty in life, fear of ruin, destruction and pauperisation, which drives the millions to seek solace under the velvety wings of religion. It is this fear characteristic of people's lives in an anti-humanistic and anti-science environment (the two are not opposite poles, as Ashis Nandy seems to make out) that engenders anxiety, barrenness, hopelessness, helplessness, inertia, immobilisation, ideological nihilism — an overwhelming sense of alienation which constitutes the focal point of leading a transition to religiosity, or quasi-religious nonsense passing under the name of agnosticism.

The need of the hour is to ruthlessly combat this alienation by an incessant tempering of the masses

in their struggle for a better life, to make internationalise revolutionary critical consciousness — and not to sanction and legitimise religion and concomitants like astrological in the name of providing 'psychological defence' to the poor, as Ashis Nandy does. The recourse to astrological enquiries by the present crop of ruling class politicians, similarly, is not just "the antics of a few astologically inclined politicians" as he seems to aver. It has much more profound meaning: it mirrors the impotence of their class, unsure about its position and future. To dismiss it in a rather casual fashion, as Ashis Nandy does, is the summit of intellectual irresponsibility.

There are some more home truths that need to be delivered to our friend Ashis. It is not science and scientists who are to be held responsible for the destructive dimensions of modern technology: the blame lies in the 'unseen hands' privileged to wield these destructive instruments. It is not medicines and life-saving drugs that "dole out mega-suffering and mega-death" — it is the drug transnationals which have converted their Third World backyards into their testing laboratories, and an inexhaustible source of plunder and banditry. And it is a measure of his lack of knowledge of elementary economics (real of feigned, one does not know), that he is not at all chary of pillorying science for the escalating arms race. Does it not amount to exonerating the "international structure of oppression" — with the omnipotent military-industrial complex as its core — against which Ashis also, writhing in a paroxysm of emotion, incidentally directs much of his holy wrath?

The world is too complex for platitudes and over-simplification. It must be remembered that a variety of Church agencies, 'spiritual' establishments with their own 'babas', 'bhagwans' and 'yogis', and a motley of missions like 'Krishna Consciousness' are mushrooming in our country. They have become direct vehicles of a multi-dimensional imperialist penetration in, and corruption of, our social life. Even our de-ideologised scientific community is not immune from their influence. This makes the task of those who claim to be torch-bearers of science and scientific temper even more arduous. Such a universal phenomenon as science cannot but be a crytallisation of man's labours and experiences over millennia. In order to be true inheritors and repositories of science, we need to be clear about our history, our present, and our perspectives — clear about sacrifices made by our magnificent people, as well as the compromises struck by the reactionary classes. The 'New Critique' with a claim to herald a "Second Renaissance" must carry forward and further enrich the traditions of our people's struggles, and must make a clean break with vestiges of treachery of our reactionary classes.

Nostalgia for the 'good old days' can be tolerable as a sentiment, but it will be a great misfortune if it is made a substitute for rigorous historical investigation and strict adherence to scientific method. In the event of this taking place, the scientific method itself will be the biggest casualty. □

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# Scientific Temper: Need for Clarity

DEEPAK DHAWAN

"EVERY revolution is preceded by intense intellectual activity," said Gramsci. Indian society, of late, has been passing through a period of great stresses and strains. The contradictions, till now submerged and dormant, are erupting like a volcano. Political parties are shifting ground in a wild rush. The classes behind them are modifying changing, adapting, and re-adapting their positions constantly. Old theories are being discarded. The contours of new hypotheses are being projected. A massive churning up process is on. The Statement on Scientific Temper is welcome to the extent that it reflects this on-going social fermentation (*Mainstream*, July 25, 1981).

The signatories to the document have rightly pinpointed some of the most demoralising developments in our polity. They have drawn attention to the rising curve of authoritarianism permeating all the vital sectors of our national life. They have chastised the dominant orientation of social sciences in our country which serve as an instrument for the rationalisation of chauvinism, communalism and an irrational cult of personality. They have minced no words in unmasking the rotten breed of political upstarts, yellow publicists, media men and others for being a party to the spread of superstitious beliefs, obscurantism, and myth-making. And they have identified the obstacle to the dissemination of the fruits of science and technology among the masses: the character of the power structure, and patterns of social stratification. This is all good, as far as it goes.

However, when it comes to tracing the origins of the present stagnation and decay, the signatories betray a woeful lack of historical sense. The most characteristic feature of India's struggle against the colonisers was the precarious consensus of a myriad social forces, heterogeneous and antagonistic in their orientations and perspectives. These forces, though united in the marathon battle against imperialism, were themselves interlocked in a struggle for establishing social hegemony. The magnitude of the freedom struggle kept the latter conflict dormant. During the course of our people's struggle for freedom, the various classes involved in the above-mentioned consensus threw-up their own leaders and intellectuals who would rationalise the situation, and articulate the view of the class they represented.

The bald contention of the signatories to the statement that the "best Indian minds" came together to stem the rot created by British advent on our soil, not only befogs the reality of a broad spectrum of heterogeneous streams ranged against Imperialism. It also does violence to an understanding of the *raison d'être* of subsequently inevitable decadence and degeneration. The mind-boggling poverty of our people and the degenerative

trends and practices in currency at present are not the result of the incompatibility between "the logic of planning and the logic of our socio-economic structure", as the signatories contend. The kind of planning introduced in India in the post-Independence period was tailor-made to fit our socio-economic patterns. The rot that has set in is an inevitable corollary of the alliance of industrial and landed oligarchs which came to rule the roost with the establishment of what our highly scientific elite have the gumption to term India's first Renaissance.

It is this new alliance which reduced the much trumpeted land reforms to just the removal of middlemen, and to an exercise at cosmetics here and there, leaving vast tracts of land intact in the hands of landed sharks, and condemned the mass of poor people to economic pauperisation, social oppression, spiritual deprivation, cultural backwardness, and thus made them vulnerable to the malevolent influence of all kinds of 'Messiahs' and 'spiritual' charlatans. The plummeting values and rising decay in our social life are the offshoots of this organic tie-up. Jawaharlal Nehru, the 'blue-eyed boy of our star-studded galaxy, was the chief arbiter of the interests this tie-up embodied.

It is this puerile infatuation with Nehru which leads the signatories to the Statement to proclaim him as the harbinger of Scientific Temper in Indian society. The logic of giving Nehru an aura of standing above social forces is seen soon afterwards when we come across the earth-shaking discovery that the Indian Constitution is "predicated upon the assumption that our ancient society needed basic changes". For the sake of historical accuracy, even the British had effected certain modifications in the legacy of ancient and medieval society, to the extent that such modifications were consistent with their colonial interests. However, what they fundamentally did was to superimpose on the inherited structure, their own colonial structure and institutions. What the post-Independence dispensation did was the creation of cleavages and effecting of modifications compatible with the attuning of the system to the image of the bourgeoisie — both industrial and agrarian.

The Constitution and allied documents are nothing more than an intellectual-legal rationalisation of bourgeois-landlord interests presented under the facade of science and socialism. The Directive Principles represented sops to lull and befuddle the people and constituted the velvet glove, beneath which lay hidden the mailed fist of fundamental right to property. The liberal twaddle about absence of "appreciation of the relationship between the objectives to be achieved and the methods as well as the instrumentalities" is similarly rooted in the intention to absolve Nehru of responsibility in