

## American government stand on scientific misconduct and its relevance to the Indian scientific community

Recognizing that protecting ethics in the practice and management of science is the responsibility of all scientists in our country, the Society for Scientific Values (SSV), a voluntary organization, was brought into existence about one and a half decades ago by a group of concerned scientists. Its membership included several fellows from the Indian Science academies, not to speak of some fellows of the Royal Society and other foreign academies. Its only strength is moral authority. Its findings are based upon proof beyond reasonable doubt. It is regrettable that frequently its findings were treated with indifference by the concerned institutions and agencies.

Recognizing the need for wider awareness of this issue, Pushpa Bhargava, the current President of the Society, organized a symposium on 'Ethics in Administration of Science' in April 2000. About 400 scientists who participated unanimously subscribed to a code of ethics for the practice and management of science. N. Vittal, Central Vigilance Commissioner (CVC), in his eloquent inaugural address pleaded that scientists should follow an ethical code in the practice and management of their profession.

Taking up this idea, Bhargava and this writer pleaded that an Office of Research Integrity (ORI) should be created under the CVC, as an ultimate appellate authority. It was pointed out that it would not be a substitute for the heads of academic and R&D institutions and agency heads monitoring compliance with a prescribed ethical code. It was argued that such a body under the CVC would have a powerful deterrent effect and would go a long way in assuring compliance with the code at the lower levels.

In his letter dated 16 March 2000, the CVC informed this writer that a high-level meeting was convened by him to discuss this issue. Apparently it was decided that at present there is no need for creating such a body in CVC. In the same letter, the CVC wanted to know whether such an ORI exists in any other developed country where scientific research has really progressed.

In response to this query, this writer contacted Irving Lerch, Head of International Relations of the American Physical Society. The information he gave was revealing. In his e-mail dated 24 November 2000, Lerch indicated that 'the US Office of Research Integrity (ORI) was originally established by the Director of the National Institutes of Health (NIH) to deal with complaints concerning breaches of ethical conduct in the wake of a few high-profile scandals'. According to Lerch, 'NIH realized that research misconduct was indeed a serious issue, but that ORI was being misdirected and used improperly and abusing its discretion through the employment of questionable investigative tools'. This is a situation not unfamiliar to the Indian scientific community which cares to ascertain the facts. ORI apparently then 'began a campaign to inform the research community, government, the public and corporations of the problems inherent in biomedical research. But the emphasis concerning scientific ethics was turned back to the learned and professional societies which have traditionally dealt with such matters'. It should be noted with some concern that similar bodies in India, including academies which command the respect of the scientific community, do not seem to have cared to face up to the problem of individual malpractices and examine them through ad hoc committees with the sincerity the issue deserves.

Lerch went on to state, 'within the US system – which is highly variegated and quite complex – responsibility is shared among professional and learned societies, funding agencies, institutions and individuals. But most important is the role of peer review in the examination of research proposals and manuscripts submitted for publication. Without a community of scholars jealous of its standards and devoted to research integrity, there can be no solution to the problem'. This is the crux of the issue in India too. Even after proof of scientific misconduct beyond reasonable doubt has been established, institutions would seem to be reluctant

to take deterrent disciplinary action against such scientists and instead prefer to exonerate them, if not let them go scot-free.

The issue of scientific misconduct was then taken up at the level of the US President. Richard M. Jones of the Public Information Division of the American Institute of Physics in his letter of 12 December 2000 to this writer, states: 'More than four and one-half years after discussions began about a research misconduct policy, the Clinton Administration last week issued a final 'Federal Policy on Research Misconduct'. This government-wide policy is to be implemented by 6 December 2001, with the assistance of a National Science and Technology Council Implementation Group (NSTCIG)'. This is in striking contrast to the manner in which the Indian committee convened by the CVC appears to have apparently resolved the issue at a single meeting.

The Clinton committee has defined research misconduct as 'fabrication, falsification, or plagiarism in proposing, performing, or reviewing research, or in reporting research results. Fabrication is making up data or results and recording or reporting them. Falsification is manipulating research materials, equipment, or processes, or changing or omitting data or results such that the research is not accurately represented in the research record. Plagiarism is the appropriation of another person's ideas, processes, results or words without giving appropriate credit. Research misconduct does not include honest error or differences of opinion'.

The policy goes on to describe 'Findings of Research Misconduct'. 'A finding of research misconduct requires that: there be a significant departure from accepted practices of the relevant research community; and the misconduct be committed intentionally, or knowingly, or recklessly; and the allegation be proven by a preponderance of evidence'. In this connection, the US Office of Science and Technology Policy (OSTP) states, 'Advances in science, engineering, and all fields of research depend on the reliability of the

research record, as do the benefits associated with them in areas such as health and national security. Sustained public trust in the research enterprise also requires confidence in the research record and in the processes involved in its ongoing development'.

What do these developments in the US signify to us? After four and a half years of study of the problem of misconduct in scientific research, *the President of the United States issues this finding for compliance by all bodies receiving federal R&D support*. The President's findings and the associated definitions are comprehensive and leave no scope for misinterpretation.

The contrast in India is striking. The best thing that could happen would be that the Indian ORI under CVC would have no work as scientific misconduct would be nipped in the bud at the agency and institutional levels! Conduct of scientific research in India is replete with instances of malpractices. It would appear that an ORI is more urgently needed in India than its counterpart, NSTCIG, in the US.

By being unwilling to create such a body, we are implicitly stating that our

research scientists are either pure as driven snow or that the system has become too rotten to be amenable for any corrective action. No honest Indian scientist could agree with either of these conclusions. The most common instances of scientific malpractice in India are senior scientists taking unfair credit for research work to which they have not contributed in any manner, and plagiarism, although falsification in scientific papers is getting to be known more and more. Why then the reluctance among scientists with professional integrity to bring formally into existence a corrective course of action? Is the scientific community too afraid to accept voluntarily a formal honour code and subordinate its conduct to it? A simple question arises. If it is not willing to provide leadership to set our house right, who shall do so? Should it be imposed, as is being done in the US President's finding on misconduct in scientific research? It is time that a formal code for practice and management at the level of S&T agencies is brought into existence as soon as possible with an Office of Research Integrity under CVC treated as the ultimate ap-

pellate authority. CVC is helpless unless the S&T Agency heads take the initiative in the matter. Its non-creation is bound to reflect on their own value systems in this matter.

Our academies and other professional bodies must recognize formally that unethical actions in the practice and management of S&T are numerous and also actively help CVC create an ORI and set up systems and procedures to ensure compliance with an honour code formulated by them. If not, Indian science is doomed and with it Indian technology. Given the present situation, our scientific community can only continue to complain about the scant attention it receives from that of the developed world, if it does not set its house in order.

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## Something is rotten in the state of education

Much has been said in these columns about falling standards in our educational system, the lack of demand for courses in science subjects, the need to popularize science among youngsters and to inculcate the scientific temper among the general public. While we scientists continue to ponder about these worthwhile issues in a decent manner, I fear that many of us may be living in a fool's paradise.

By chance, I happen to live in a state which has really advanced in terms of alternative educational scenarios. I refer, of course, to the current and seemingly endless craze for an engineering degree. The state of Andhra Pradesh is home to many innovations in this regard. All of coastal Andhra is dotted with residential outfits that train students to

take the engineering and medical common entrance tests. Here, the day begins at 4.00 a.m. and ends at 10.00 p.m. To my knowledge, the only other institution that worked successfully according to these hours was Auschwitz.

Continuing with the theme of *Arbeit macht frei*, let us consider a popular operation in Hyderabad, wherein of the 125 students who are trained each year, around 110 routinely clear the IIT-JEE. Recently, 7000 students appeared for a test for entry into this study circle – a test to write another test. This number is close to half the number of students who appear for the entrance tests of all the programmes of study offered by the University of Hyderabad. The attrition rate in this test is, therefore, much higher than that in IIT-JEE itself. This is not all.

Several colleagues from IIT-Madras have complained to me about the very limited ability of these students to cope with the B Tech curriculum there.

This craze, or shall I term it insanity, to acquire an engineering degree has spread everywhere. No one is exempt. A non-teaching employee in my department expressed concern about putting his child through this monkey mill. He was scared. Indeed, he had absolutely no idea as to even what the word engineering meant. The daughter of one of my colleagues told me that the only reason she was trying for an engineering seat was because she felt that she could not get married if she did not become an engineer.

The story goes on and the examples are endless. That the levels of despera-