

## Science communication in the Indian context

Indian society has reached a complex socio-economic and cultural stage. It differs from the western world in which Philip Cambell is experiencing a glut in science communication<sup>1</sup>. The literacy rate in our country is very low, the science literacy is much limited and only a thin section of society is aware of frontiers in science, e.g. the information technology and biotechnology. The public and the leaders in various sectors whether illiterate, literate, educated, professionals or executives live with philosophical conflict of religion and science and cultural conflict of tradition and modernity.

An increase in coverage of science in our media seems to follow the world trend which is predominantly occupied with the abstracts of the stories of neurobiology, biomedicine, astronomy, information technology, etc<sup>1</sup>. Cambell<sup>1</sup> agrees that the media stories speak very little about the public understanding of science but he believes that it will automatically grow over the years due to the public interest for science. This view looks oversimplified in the Indian context which possesses a very heterogeneous public significantly differing in socio-economic, cultural and philosophical levels.

Science, being knowledge, power and profit can be a powerful tool to determine the actual control on the public. The larger segment of the world's population is waiting for the fruits of science, on one hand, and a massive market interest is growing to grave the science for profit motive, on the other<sup>2,3</sup>. One can notice a conspicuous change in the relationship between science and the public which is affected by privatization, liberalization, globalization, etc. At one level, the traditional institutional boundaries are diminishing, and on the other, the market forces are

creating new institutional barriers to separate science from the public. The new generation technoscience, in spite of its high efficiency to resolve the human problems, is reaching out to the public at large and redefining the social legitimacy of science and technology. It reflects clearly that this technoscientific knowledge generating sites are changing rapidly, e.g. from the public sector to the private institutions and they can no more be considered as public property.

Nuclear, biological, and chemical weapons, destructive potentials of the human genome and genetic engineering studies, patenting natural and biological resources and degradation of the environmental resources, etc. are various aspects where ethical and moral issues are raised<sup>4</sup>. The societies react on these issues according to their socio-cultural positions and assumptions rather than critical evaluation. We have to respond to these issues in a more systematic and rational way in the interest of the entire human population. A complex situation arises sometimes due to poor understanding of the underlying principles of science and religion in the societies. The actual inter-relationship between the two has hardly been worked out with a critical and analytical review of the two ways of the human concerns. Such challenges are unique to nations and societies not having truly modern public and overwhelmed with superstitious belief and religious sentiments on many issues crucial for spread of a scientific attitude.

Science communication has been a major concern in the country for several groups of people over the years. Certain government, nongovernment and voluntary agencies have been experimenting with programmes predominately with the involvement of school children<sup>5-7</sup>. They have developed many new ways of

science communication, e.g. performing and folk arts forms, joy of learning with plays and toys, discussion forums, science clubs, seminars, explaining and exploring miracles and mysteries, children science congress, nature watch and excursions, slide shows, planetarium, exhibitions, science parks, etc.

More seriously planned agenda and policies for science communication in a truly transparent manner are a prerequisite to organize and speed-up science communication in India for the new millennium and to develop a public consciousness of the issues and the understanding of science in a more strategic manner. We have to be more methodological and institutionalized on one hand, to consolidate, and to go beyond all the institutional and framework boundaries with several innovative ideas to expand, on the other.

1. Campbell, P., *Curr. Sci.*, 1999, 76, 624-625.
2. Rao, M., Paper presented at the workshop on Science and its Public; Knowledge, Movements and Images, at NISTADS, New Delhi, 23-24 March 1999.
3. Ramalingaswami, V., *Curr. Sci.*, 1996, 71, 504-505.
4. Bal, V., Paper presented at the workshop on Science and its Public; Knowledge Movements and Images, at NISTADS, New Delhi, 23-24 March 1999.
5. Passi, B. K., *Everyman's Science*, 1993, 28, 110-114.
6. Kamble, V. B., *NCSTC Commun.*, 1998, 9, 2-4.
7. Tyagi, B. K., *NCSTC Commun.*, 1998, 10, 2-4.

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## Restrictions on participation in meetings

In a situation where two neighbouring countries with nuclear weapons capabilities maintain a hostile posture, bringing together scientists from the two

sides to discuss the situation and alleviate tensions was, in our opinion, an eminently sane and rational course of action. Therefore, as citizens and scien-

tists belonging to Argentina, Brazil, India, Israel, Pakistan, Sri Lanka and the US, we had enthusiastically welcomed the efforts of the American

Physical Society (APS) to host a roundtable discussion at the Atlanta Centennial Meeting to identify the role of physicists to build bridges between nations which otherwise may be having conflicting interests on nuclear issues or issues related to physics. Some of us had even arranged discussions on the same issues in our institutions to take advantage of these visitors. To our disappointment, we subsequently learned that the invited speaker from India, T. Jayaraman, was denied leave to participate in the APS discussion by the Director and the authorities of the Institute of Mathematical Sciences, Chennai, where he works as a theoretical physicist.

The reason given by the Institute's Director for his action was that Jayaraman's participation was not in the interests of, '... the Institute and the nation'. Several appeals did not change the Director's decision. Subsequently, the Director stated that as the Institute is under travel restrictions by the US government, and the APS has been unable to remove these restrictions, it would not be appropriate for Jayaraman to participate in the APS panel. On the contrary, the APS has succeeded in re-

moving such restrictions in specific cases and has continued to work for the removal of all impediments to the free circulation of scientists through both public appeals and by close interaction with US governmental agencies.

We feel that the present age compels us to think in global terms and thus the denial of leave to Jayaraman to participate in the panel discussion is a violation of his academic freedom and has done disservice to the cause of promoting international peace. We urge the Director of the Institute of Mathematical Sciences, and the Government of India, to desist from applying such restrictions in the future.

Physicists have an important role to play as promoters of peace. Preventing open scientific exchange injures science as an instrument to advance the international scientific enterprise, to develop comity among scientists, to advance our common culture and to contribute to the welfare of nations.

*Signed by:* Luis Masperi (Argentina), Luis Pinguelli Rosa (Brazil), T. R. Govindarajan (India), M. V. Ramana (India), Zia Mian (Pakistan), A. P.

Balachandran (India), Jeeva Anandan (US/Sri Lanka), Saeed Durrani (UK/Pakistan), Avner Cohen (US/Israel), W. K. H. Panofsky (US), M. H. Engineer (India), Pervez Hoodbhoy (Pakistan), Irving Lerch (US).

The signatories assert that the statement reflects their sentiments alone and does not represent the official position of their organizations or institutions.

#### *Editors' note:*

*The above statement was prepared and signed by participants in a panel discussion on 'The Role of the International Physics Community in Arms Control' held on 21 March, in Atlanta, Georgia, at the beginning of the American Physical Society Centennial Meeting. The panel was moderated by W. K. H. Panofsky and included Luis Masperi (Argentina), Luis Pinguelli Rosa (Brazil), Pervez Hoodbhoy (Pakistan), Avner Cohen (Israel and US). T. Jayaraman (India) was denied permission to participate in the meeting even though funds to support his travel had been provided.*

## Profound scientific base nucleates, nurtures and develops an in-depth technological pursuit

The government decision to reward DRDO scientists with enhanced pay and also to recognize various collaborating institutions for a set of handsome annual awards for development of defence-related technologies is totally non-academic, devoid of real incentive and can hardly be justified. It appears that the entire credit for specially chosen and carefully prepared ingredients for baking a good quality cake under specified temperature control has gone to a maid for strictly following the baking instructions. Indeed, it is a matter of great concern for the scientific and technological community in the country. The government of India should be congratulated for taking the initiative which was not taken so far. The fault lies with the questionable competence and frankness of the advisory system which per-

haps did not muster courage to brief the government officials objectively and warn them of unforeseen and unwanted interpretations<sup>1,2</sup>. The best way to correct this mistake is to open an in-depth discussion to resolve the issue at hand. The selection of talented scientists, engineers, technologists and supporting staff for special scales and awards over and above the existing scales is an important task. If the selections are made objectively based on well-documented achievements, qualifications and categorical recommendations, it would inspire good students to opt for scientific and technological jobs. Unfortunately, the situation that prevails in the country presently is highly disappointing. As a consequence of this, good students are not opting for teaching, research and development, either in universities or

research laboratories under the government. Seniority of scientific personnel has played the dominant role for promotions, awards and rewards without caring for talent and merit of scholars and employees in scientific institutions and universities.

Barring a few institutions, good research is not done in scientific departments and academic institutions in our country. Academic institutions should be treated on a different footing and all those pursuing teaching, research and development, should be kept on a different scale of pay with a rigorous evaluation system and incentive-based promotions. Their work should be regularly evaluated, awarded, rewarded or they should be warned for lapses using well-debated criteria at the national level. However, the national cri-