

Escapist obsession

I notice that successive editorials in *Current Science* are obsessed with this 'big science' vs 'small science' or 'basic science' vs 'applied science' syndrome. This is very unfortunate, since the whole developed world is not worried about these distinctions any more. Especially, in areas such as biotechnology, it is very difficult to draw a line between basic research and its application. The watchword is collaboration, not only between academic institutions, but also between academia and industry. Outstanding scientific papers result from such collaborations, since techni-

cal inputs come from scientific groups with different expertise. These collaborations also generate leads ending up in commercially viable products. To keep harping on individual-based small science reflects a frog-in-the-well attitude that is not good for India. I think scientists in power in academic institutions in India are essentially escapists, who feel secure in their small world of paper-publishing and would not want others to come up through innovative applications and challenge their high moral ground of science for science sake. I notice that bulk of research grants in

India is still grabbed by individuals and organizing major collaborations is extremely difficult. Small, individual-based science can have its place, but what India needs is for people to come together to achieve major goals of relevance to society. Let us not waste our time and effort in dampening even the few initiatives which CSIR and other institutions may be taking.

D. K. SANYAL

*School of Computer Science,
Amherst, Boston*

Free access to biomedical journals

The World Health Organization, Geneva and the world's six biggest medical journal publishers announced a new initiative which will enable about 100 developing countries to gain access through the Internet, almost 1000 of the 1240 world's top leading biomedical and scientific journals for free or at significantly-reduced rates. Scheduled to begin in January 2002, the initiative is expected to last for at least three years, while being monitored for progress. The six medical journal publishers are Blackwell, Elsevier Science, the Harcourt Worldwide STM Group, Wolters Kluwer International Health & Science, Springer Verlag and John Wiley. It will hopefully reduce the health information gap between rich and poor

countries (Press Release, WHO/32: 9 July 2001, World Health Organization, Geneva, 2001).

Back home, the indigenous initiative, the IndMED database (<http://indmed.nic.in>) of the ICMR-NIC Centre for Biomedical Information, New Delhi, provides bibliographic information from 75 Indian biomedical journals, many not covered in major international databases. It is high time that the fortnightly multidisciplinary journal of research from India, *Current Science*, be indexed selectively for articles relating to the field of biomedicine in the *Index Medicus* database of the National Library of Medicine, National Institutes of Health, USA. This suggestion for consideration is quite reasonable. Besides

publishing quite a few articles in the field of biomedicine on a regular basis, *Current Science* has also brought out a number of special issues in the field of biomedicine in the past one decade or so. Once it is included in the basket of *Index Medicus*, the abstracts of papers in this important journal can be freely accessed through PubMed on the Internet.

N. C. JAIN

*Division of Publication & Information,
Indian Council of Medical Research,
Ansari Nagar,
New Delhi 110 029, India
e-mail: jainnc@vsnl.net*

Poverty, hunger and transgenics

Genetically modified (GM) crops are believed to hold promise for poverty alleviation and increased food production (with enriched nutritional value) for the developing world, with a projected population growth in 2025 (ref. 1). GM crops are presented as a cutting-edge technology by the science establishment, for solving social and eco-

nomie problems of the country. Is this euphoria justified based on past experiences and sound scientific reasoning? It is generally overlooked that the green revolution was propelled by publicity campaign of American agribusiness – chemical fertilizers and pesticides, and tractor-trucks industry. Though food production deficiency at that time called

for urgent solutions, Indian agricultural scientists failed to adopt a long-term scientific approach, incorporating traditional rural wisdom derived from cattle-based small-scale ecofriendly farming system into the modern approach; to say the least they were swayed by the advertisement blitz emanating from the USA. Today, the situation is much more

complex and frightening: most of the biotechnological research is controlled by multinational corporations (MNCs). The World Trade Organization (WTO) has institutionalized MNC-IMF-WB monopoly on the world economy.

Transgenics is marketed as the technology for meeting the increased food production demand for the estimated large population in 2025. That this is a misleading argument becomes obvious if we take note of the present situation: though there is an excess of food grains in India, poor people do not have access to it, and on the world scale it is not the shortage of food, but the inequity which is responsible for food insecurity. A more basic argument against GM crops is that this technology did not originate with the aim to help poor countries produce more food². MNCs are in the business of profit-making, and WTO regime facilitates their easy entry in the developing countries, as well as forces the developing world to make IPR (intellectual property rights) laws most suited to them. Realizing that more than 60% of people in India depend on agriculture in contrast to less than 6% in USA, and that India is a bio-diversity-rich country

compared to USA, we should not accept the recommendations of science academies for GM crops without independent studies in Indian conditions. It is strange that Bhatia cites such reports³ as final scientific verdicts. Much less is known of transgenics in the tropical environment and its impact on the natural bio-diversity over a period of time. Apprehensions and concerns expressed by Bharathan⁴ taking *Bt*-cotton as an example, deserve serious consideration; should we be concerned to placate MNCs³ or be responsible to the interests of the people? Even a single case of suicide would have jolted the policy makers in USA, but more than 50 suicides by farmers have not sensitized the science/political leadership in India. A view has been expressed by Juma, an adviser to WB that for poor countries, environmental safety or health are not key issues for transgenic crops². The Vision 2001 statement released at the 88th Indian Science Congress bears the imprint of WTO guidelines; therefore it was nice to hear M. S. Swaminathan's demand for a white paper on GATT-94 and the Indian government's commitment on agriculture. Why has this not been pursued?

To conclude, lack of credibility, foresightedness and honest commitment to the welfare of the people characterize the science establishment in India; gene revolution administered by MNCs is a grave threat to the agriculture, bio-diversity and poor of the country. It is likely that WTO may not survive by 2005 due to clash of interests between USA and the European Union, and assertive voices of some developing countries and NGOs, but drastic policy changes conforming to WTO in India may cause irreversible damage to the socio-economic fabric of the country.

1. Sharma, H. C. *et al.*, *Curr. Sci.*, 2001, **80**, 1495-1508.
2. *Nature*, 1999, **402**, 341.
3. Bhatia, C. R., *Curr. Sci.*, 2001, **80**, 321-322.
4. Bharathan, G., *Curr. Sci.*, 2000, **79**, 1067-1075.

S. C. TIWARI

*Institute of Natural Philosophy,
c/o 1 Kusum Kutir,
Mahamanapuri,
Varanasi 221 005, India*

***Bt*-cotton in China**

In the article 'Technological developments and cotton production in India and China' (*Curr. Sci.*, 2001, **80**, 925-932), Bhagirath Choudhary and Gaurav Laroia have overlooked several aspects of *Bt*-cotton in China. Although it is interesting, some statements are inexact and are not based on facts. It is the intention of this correspondence to provide a clarification on the research and commercialization of *Bt*-cotton in China, which are elaborated below:

Firstly, Chinese scientists, from the Chinese Academy of Agricultural Sciences (CAAS) and other institutes, began research on *Bt*-cotton in late 1980s^{1,2} and not in 1991, but the first scientific paper about obtaining transgenic *Bt*-cotton by genetic engineering and its insect-resistant characteristics was published in 1991 (ref. 3). Bollworm outbreak and dramatically decreasing cotton yield because of bollworm infestation in China in the

early 1990s made the Chinese government divert more attention and money on *Bt*-cotton research. But, it is not the main reason for initiating *Bt*-cotton project in the 863 High Technology R&D programme; this is because the *Bt*-cotton project was initiated before bollworm outbreak.

Secondly, by the end of 1996, although there were many *Bt*-cotton lines bred by Chinese scientists, including scientists in CAAS and other institutes, no *Bt*-cotton variety had been bred and developed in China¹. The first *Bt*-cotton variety was licensed in China in 1997 to NewCot 33B, imported by Jidai Cotton Seed Company Ltd from Monsanto Company. In the following year (1998), eight *Bt*-cotton varieties were developed and licensed; of these four (CRI 29, 30, 31 and 32) were developed by the Cotton Research Institute of CAAS; the remaining Goukang 1, Jimian 26, Jiza 66 and JD-3, were developed by the

Biotechnology Research Center of CAAS, the Shanxi Cotton Research Institute (in collaboration with Biotechnology Research Center of CAAS), the Hebei Cotton Research Institute and the Jidai Cotton Seed Company Ltd, respectively^{1,4}. In 1999 and 2000, more and more *Bt*-cotton varieties were developed and licensed in China. At present, at least 15 *Bt*-cotton varieties are cultivated in China; four of them were developed by Monsanto Company or its joint enterprise, Jidai Cotton Seed Company Ltd⁵; the others were developed by Chinese scientists^{1,4}. Besides these *Bt*-cotton varieties, at least 30 breed lines with *Bt*-cotton or *Bt* plus *CpTI* genes have been developed and are being considered for variety license^{1,4}.

Thirdly, the environmental release and commercialization of genetically modified (GM) organisms (including plants, animals and microbes) are regu-