champions of transgenic technology. Besides the resistance of scientists to answer many questions from the audience during the panel discussion, their reluctance even to acknowledge the potential risk to environmental safety left many in the audience resentful. Specific cases of published accounts of potential risks were brushed aside as being anecdotal and went to the extent of stating that every technology has a risk (!). Atleast one speaker denied the existence of scientific proof for gene escape and cross pollination with related species when infact there is evidence for intraspecific transfer of pollen from transgenic plants[8].

Even though there was strict censoring of questions submitted to organizers much before the panel discussion, the students and teachers – who defied the whip of the research administrators of the UAS against any 'personal opinion' – could raise a few questions towards the end of the session thanks to M. Sharat Chandra (Indian Institute of Science) who led the panel discussion. The audience questioned the marginalization of the national agricultural research system in the current field trials and testing of transgenic varieties, for which inadequate facilities in agricultural universities and institutes was cited as the reason. This evoked sharp criticism which led to the assurance that State Agricultural Universities will be included in future in such trials and experiments. Bypassing the established procedure of ICAR for testing any variety is akin to bypassing ICMR for clinical trials of vaccine. As a reply to a question, it was said that the officials of the DBT have so far made 17 visits to monitor field trials of Bt cotton revealing the fact that they could not visit all the 40 plots even once. This raises doubts about the authenticity of data collected from such trials. The discussion went to the extent of questioning the very purpose of organizing the seminar, pointing out the total exclusion of critics of the technology and it was alleged that the seminar was only for giving a clean chit to the MNC involved in the row. Absence of a section on socio-political and ethical issues involved in the introduction of transgenic varieties was as glaring as the mute presence of agricultural scientists from the UAS. Interestingly, the latter did not escape the notice of the panel leader Sharat Chandra.

Incidentally it may be noted that only a negligible minority of agricultural scientists of the country have come forward to fulfil their social responsibility by expressing their views on the pros and cons of transgenics. Evidently, the seminar was organized by the administrators of science – who went to the extent of suppressing all voices of dissent – to justify their own action. A seminar of this sort, that lacks objectivity and scientific temper, besides equating the scientific community with the popular media that sensationalizes and mystifies science raises many serious questions about the academic and intellectual freedom of individual scientists.

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A methodology for clinical evaluation of existing practice, using traditional herbal medicinal formulations

A supreme court judgement makes open clinical trial, conducted by a mutually oriented multidisciplinary group of experts including doctors of various systems of therapy, as the legal and effective method to carry out the clinical evaluation to determine the exact role of a given traditional herbal medicinal formulation (THMF) – which includes those from Ayurveda – in ameliorating a particular disease. Blind clinical trials have a place in the second phase of research when two THMFs, whose role in treating a given disease has already been confirmed, need to be compared for their efficacy. However, testing on laboratory animals prior to the human clinical trials will have to be done when the ingredients and/or vehicle of a THMF of proven value are altered to increase the latter's efficacy during the next phase of research.

Compartmentalization of medical practice in India facilitates the 'natural random allocation' of patients to conduct this study.

Patient selection will play a major role here. Eastern medicines, including Ayurveda, are more based on the response than the clinical parameters; with enough space for retrospective diagnosis. According to the theory of Prabhava, for a single THMF there could be more than one response with the same dosage. If the patient has the illness, response is thereapeutically beneficial. Hence Ayurvedic treatment is individualized in terms of therapeutic response. Let us consider the example of Thuja, in the treatment of venereal wart. As per the existing homeopathic knowledge, thuja in the potencies used for this disease will not produce any side-effects in a correctly chosen patient. Hence those patients who develop side-effects will not come under the selection criteria to use this drug. Therefore patient selection should begin after patient allocation, and is likely to be a continuous process throughout the clinical evaluation. Clinical features of these patients will become the criteria for patient selection during the repetition of clinical trial using the same

THMF. Diagnosis in such cases needs to be confirmed, with the investigative techniques available in modern medicine, so that drugs from different systems of therapy can be compared. The clinical data accumulated by such multicentric trials using 'standardized THMF' will define the indications for a given THMF.

In Ayurveda, some diseases are given specific names and while others are described without specific names. Hence a list of indications for a given THMF does not exist in literature. Ayurveda texts are only the guidelines and much emphasis is laid on the accumulated experience of treating doctors. Evolving the criteria for patient selection, by the process of recording the experiences of Ayurvedic physicians, could answer the basic question of indications for a given THMF. This may also give a new direction to the practice of patient treatment in Ayurveda.

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NEWS

Education in Germany

Germany is one of our key partners in Science, Technology and Education since many decades. There has been good interaction between the scientists, scholars and students in the past. However, there has been no improvement in the situation in the last decade due to various reasons. Germany has studied these reasons and has now come out with measures to attract more foreign students, scientists and scholars for education and research recently.

The German Government has taken a decision to introduce B Tech and M Tech courses in English and are targetting about 20% of foreign students in German Universities in the coming years. Many German universities have introduced special courses and programmes in English like infrastructure, health sciences, public engineering, energy, environment, etc. The German education system has also been restructured to some extent in the pattern that we follow in India, particularly for technical education. There is a distinct advantage in the German system for students as these involve special training and practical applications. I consider that there is a need to popularize the avenues and the new initiatives among our students in India so that they can look up to Germany besides other countries as their destination abroad. The significant avenues for our scientists and scholars are the fellowship programmes and scholarship programmes awarded by Alexander von Humboldt Foundation, German Academic Exchange Service (DAAD), Volkswagen Foundation, Carl-Duisberg Gesellschaft (CDG), etc. While there has been good success rate among the applicants for these prestigious programmes from India, the number of applicants itself is not much. An action plan to enthuse our scientists and scholars for responding to these programmes is essential.

The schemes mentioned above while attracting the Indian scholars, scientists and students expect them to return to India after their education or training or research experience. This is a very positive point for India in developing a strong base of highly qualified and trained personnel for the country.

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Genetically modified organisms in agriculture: A risk-aversion package

During 1998, nearly 12 million hectares were under transgenic crops with most of the area covered by genetically modified (GMO) soybean, maize, cotton and canola (mustard). Nearly 75% of the area under GMOs was in the USA where the regulatory measures in force seem to ensure that the public have confidence in the environmental and nutritional safety of GMOs. This is not the case in India as well as in European Union countries. A group of experts constituted by the Royal Society of London to go into this question have concluded that consumer confidence, based on an appreciation of the scientific evidence and the regulatory checks and balances, will ultimately decide whether or not GMOs will make a significant contribution to feeding the world's rapidly expanding population (*Genetically Modified Plants for Food Use*, The Royal Society, London, September 1998, p. 16).

India's agricultural strategy for the 21st century will have to place emphasis on producing more per unit of land,