

Necessity of broadening science base in India

This has reference to articles published in *Current Science* about 'ills of Indian Science', 'Indian Science being drifted into obsolescence' and totally 'getting drowned in the sewage', etc. I would like to point out that such articles, in addition to having a demoralizing effect on young Indian scientists, do not reveal the reality. For instance, I feel that my branch of science (organic chemistry) is better now in India than it was 20 years before and the gap between us and the western scientists is getting smaller in this area. This may also be true in several other areas.

These facts are not insignificant when one considers the reality that the candidates admitted to S&T institutions in India come mainly from a small fraction of the 900 and odd million. So, we should com-

pare ourselves only with countries such as Finland, New Zealand, etc.

If we wish to compete with scientists in USA, Japan, etc., then it is important to improve on the competitive level of scientists in India by making the S&T institutions accessible to candidates from the entire population. That is, instead of declining admission in S&T institutions, *de facto*, to a large section (> 95%) of our population, both the political and science policy makers should come out with plans so as to tap talent from the entire population. This would certainly improve the competitive level of Indian scientists. The Chinese have amply demonstrated this in the recent years.

For example, 20 years back, Indian students did not have problems in scor-

ing >90 percentile in GRE examinations. Their competitors were mainly the Taiwanese and south Koreans. But these days their main competitors are mainland Chinese and our toppers from even prestigious institutions get poor 60-70 percentiles! Clearly, the Chinese students who come through a massive competition at home are able to compete better than Indians in the international arena!

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More on the NSU

Apropos the rejoinder of P. N. Srivastava, which appeared in *Current Science*, 1995, 68, 1190, may I ask the following straight questions to the author?

1. When one wants to build an institution of quality, why should one think of reservation, even for NRIs? Does it not reflect the current Indian mentality, reservation for weaker sections, now reservation for NRIs. Why should the recruitment not be on merit and merit alone?

2. If the Government is to contribute substantially for the establishment of National Science University (NSU), will it not bring pressure for reservation in admissions, and even in staff recruitment, for weaker sections of society?

3. What is the guarantee that NRIs recruited would be meritorious? People who want reservation would also manipulate and make believe that they are good.

4. What is the guarantee that NRIs would continue supporting NSU financially? People who want advantages in the beginning itself would desert the NSU once they find that they are not deriving any benefit from it.

5. Why should the NRIs not help financially the development of science in India, without any strings attached?

6. Why should the NRIs not think of improvements in IISc and in IITs by persuading the Government to change their constitution and pouring money in them to equip them well with staff and equipment? Many of the NRIs are products of these institutions and they will only be paying their debt to their Alma Mater. The NRIs, of course, would not be satisfied, for they would not have a dominant hold on the institution.

7. What is the guarantee that the NSU-trained graduates and postgraduates will have the missionary zeal to work, on relatively ill-paid salary, in colleges and universities which would continue to be ill-equipped as compared to the NSU.

8. Will not the NSU-trained graduates and postgraduates seek greener pasture in USA and other advanced countries?

9. Is the present concern of the NRIs for science in India because (to quote from Mahajan and Sudarshan (see *Current Science*, 1995, 68, p. 1260 (1295))

(i) he does not feel a full citizen of the institution in America which controls his career,

(ii) he, having gone knocking on the American doors, believing in the universality of science, has now realized, although the realization has come rather late in the day, that American scientific establishment is less than fair to many of its most outstanding imports.

In my opinion the crying need of the hour is not setting up new institutions but strengthening selected existing institutions, such as IISc, some IITs, some universities, massively with funds, additional staff of quality and also introducing some reforms in the administration.

There are many Indians working in India who are intellectually much better equipped than most of the NRI scientists.

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Response:

The concerns expressed by Narasimhan are a clear case of misinformation or ignorance towards facts about which I had referred to in my rejoinder. There is, therefore, no doubt why some persons have referred to the whole project as 'naive' because they have not read my articles 'The concept of the National Science University: A rejoinder' and 'National Science University: Final Report' (*Current Science*, 1995, 68, 1190–1198) carefully. I respond to the specific questions pointwise.

1,3. I wonder from where the author has got the idea that there will be reservations for NRIs. There will be no reservations for anybody, NRIs or Indians. The only point that has been made is that 'Further, what is wrong to expect that about 20–25 (out of a faculty strength of 200–250) well-established Indian scientists working abroad should decide to return to India for good to give a boost to this university by working here' (p. 1190). This is no reservation. 'The selection will be done with the active participation of and advice from the International Advisory Committee (p. 1194)' only on merit and no other consideration. Is this reservation?

2. As already mentioned in point number 1, there will be no reservations in admissions, staff recruitments, etc. The point is very clear to us that we

would rather not have the university than have a university with reservations. The financial contribution from the government is not sacrosanct. The objectives of the university will, in no case, be sacrificed.

4. The university will be established only when the trust will be formed and there is no need to have any guarantee from the NRIs. The responsibility of raising further funds will be that of the trust.

5. No contribution or donation with strings will be accepted either from Indians or from NRIs.

6. Why should IISc or IITs not approach the NRIs for financial assistance? Who has put this restriction? Who can allege that more money has not been poured in IISc and IITs as compared to the universities? When I was in Bangalore during the last Indian Institute of Science (Bangalore) Court Meeting, a number of scientists belonging to IISc questioned the money that was poured into the Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, and stressed that if only a part of that money would have been allocated to IISc, it would have improved the Institute immensely. Why did no one raise this issue at that time?

7,8. Why should there be any guarantee for this? Is it not a fact that many graduates of the IISc, IITs, many uni-

versities such as Delhi, JNU, BHU, Hyderabad, etc., stay on in India and has the country not benefited from them? Some of them do go out for good but others return as well. If the argument of the author is carried to the other end then only those institutions should be supported whose graduates are considered unfit for selection for going abroad. However, I have always been positive and do hope that Indian colleges and universities are going to improve in future.

9. This point refers to an article published in 1986 and reprinted in *Current Science*. The views expressed in this article have no bearing on the establishment of the National Science University. The pertinent official documents in this connection prepared by the committees appointed by the Government of India are the Concept of the National Science University and the Structure of NSU, reference to which has been made in *Current Science*, 1995, 68, 1192.

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SCIENTIFIC CORRESPONDENCE

Comments on 'What kind of a system is a human being? A cybernetic system?' [*Curr. Sci.*, 1994, 67, 936–940]

Narasimhan's account of the history of research in human cognition and his prognosis as to its future are well taken. Of concern, however, is his use of the term 'cybernetic system' without definition. Neither Wiener nor, as far as we know, Ashby, ever used this expression. The word 'system' was used by Wiener only in familiar contexts such as the solar system or the nervous system, and he never thought of himself as a 'system theorist'. Indeed, the technical uses of the term 'system'

in the literature make it equivocal, and there have been complaints about 'fuzzy thinking' in this field, e.g. from Kalman *et al.*¹. It is, therefore, essential that the term 'cybernetic system' be clearly demarcated before the question 'Is a human being a cybernetic system?' is asked. Such a demarcation will, of course, depend on how one interprets the underlying concept, *cybernetics*.

Unlike the term 'machine', which Wiener defined clearly as 'a multiple-

input, multiple-output transducer', he never clearly prescribed the range of the term 'cybernetics'. Narasimhan [p. 937, col. 1 para 4] mentions Wiener's use of it to mean 'the entire field of communication and control in the animal and the machine'. Since very large tracks of engineering and almost the whole of the human and biological sciences involve communication and control, this definition is woefully general. A fuller rendition of what Wiener intended appears in his 1950 book²: