

The NSU, devoted to the cause of excellence, has to have a modest size. Excellence, by definition, is not a common commodity and its maintenance will be rather expensive. It is obvious that NSU is expected to be and will be an academically elite educational institution. But elitism, in case of NSU, will come only from a student's ability, her/his interest in science and research, and her/his dedication and commitment. Once admitted through open competitive selection, he will not have to drop out because of her/his family's financial inadequacy. Her/his education will be supported by the university through advancing financial resources for which proper arrangements will be made. The university will not be run through capitation fee charged from the students. A bright young person devoted to learning is society's

greatest treasure; it will be our responsibility to give them the best education at a cost they can afford. To start, the university should be able to support a student body of 1000–1500 and a faculty of about 200 to 250.

It must be stressed that the concept of the National Science University is a fundamental departure from what is existent; it is anything but an extension of the current university concept. The university will have to be funded with full recognition that almost every modality proposed is new; we need all this newness to be scientifically and technically ready to meet the challenges for the years to come. And finally, if the experiment succeeds, we are sure that many more universities will be established with the support of the public, business and industry.

On the proposed National Science University

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A proposal has recently been made to open what has been termed as the National Science University (NSU) of India. The idea seems to have been mooted by some Non-Resident Indian (NRI) scientists, notably by Swadesh M. Mahajan, a physicist from Texas. The plan envisages the establishment of a corpus fund of Rs 400 crores, the annual interest from which would take care of the running expenses of the university. It is understood that the Government of India is favourably inclined to this proposal and might be asked to contribute a one-time grant of Rs 200 crores or 50% of the corpus fund. This amount will mainly go to set up the infrastructure, building and physical facilities. The other half of the corpus fund is expected to be raised through investments by NRIs and industrialists. A concept document has been prepared by Mahajan which is doing the rounds in various places in India (*Current Science* has been able to obtain a copy of this document as well).

The concept and its promotion

This idea of the National Science University is being championed by P. N. Srivastava, former Vice-Chancellor of the Jawaharlal Nehru University, New Delhi and former Member, Planning Commission. Srivastava has said that he has received enthusiastic responses on this matter from Arjun Singh, Union Minister of Human

Resource Development and Manmohan Singh, Union Finance Minister. Recent newspaper reports have indicated that Srivastava was taking this matter to the Prime Minister for his concurrence. In an earlier interview to the press, Srivastava was quoted as saying that it is a 'New concept in university education, not a type of any existing university. Rules and regulations will be really at the rock bottom and administrative expenditure will be kept below 20 per cent of the total'. He is also reported to have stated that discussions have already taken place for obtaining suitable land for the purpose of establishing the university in the vicinity of Delhi and that the Governments of Haryana and Rajasthan have expressed interest. It has been further mentioned that Srivastava heads a committee set up by the Minister of Human Resource Development to go into the details and feasibility of the NSU and that this committee has submitted its report.

There are several interesting points that emerge from this issue. The very first is the refreshing possibility that rules and regulations will really be at the minimal level and that administrative expenditure would be kept at the rock bottom. Anyone familiar with the finances of higher education in India, and universities in particular, would know that more than 70% (often as much as 90%) of the budget of a university is spent on staff salaries and maintenance, leaving precious little for the *raison d'être*, namely teaching, research and development. Even first class institutions such as the Indian Institute of Science, Bangalore, the Tata Institute of Fundamental Research, Bombay and the IITs spend most

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of their money on housekeeping; faculty members who wish to pursue research have to invariably seek and obtain funds from outside.

The second point that is of interest is the possibility of operating the NSU as a separate entity independent of the government and of the University Grants Commission. While these points need to be confirmed and agreed upon, it raises the interesting issue of why it should be so. Implicit in this is the acceptance that the UGC is suboptimal and that the Universities Act may need to be changed. The third interesting point is to do with the idea of a university totally dedicated to the sciences. While we have had institutions dedicated to engineering, technology, medicine and agriculture, an exclusive science-based university is a good idea, though not exactly novel, since the Indian Institute of Science, Bangalore has been an outstanding (albeit lone) example for the last four score years.

Perhaps the most interesting point is the basis of the idea. As mentioned above, the seminal concept has been put up by Mahajan of Texas who has argued the case in ten single-spaced sheets of paper. It is to this that I want to turn my attention to.

The perceived need for NSU

Mahajan assesses India's contribution to the science and technology of the modern era to be 'disappointingly small; high quality research is almost non-existent and even minor achievements have been few and far between'. The primary reason for this continuing poor quality of research is suggested to be the underlying structure and organization of the Indian scientific establishment. The establishment is perceived to be run by a coterie of science managers who are no longer active scientists but who control the money, jobs and the decision on which scientific areas and directions must be explored in the country.

Mahajan further notes that the reason why the universities in India do not conduct high quality scientific research has been the creation of a large number of research institutes independent of and totally unconnected to, the universities. This separation is thought to have caused as much damage to Indian science as has the 'feudal character' of our scientific establishment. His views about the research institutes are not any more generous. A typical national institute is perceived to decay very shortly after its birth largely because of the lack of built-in-regenerative mechanisms to continually detect, train and nurture new local talent.

The solution suggested is a complete overhaul of our scientific establishment. 'The idea of separating research institutes and universities should be abandoned. New universities must be created, born out of a synthesis of

the best of the institutes and of the universities. National laboratories should be devoted to particular well-defined projects and not any larger charter.'

While there might be discussions on individuals and perhaps also on individual institutes and universities, I believe Mahajan's idea of a research-stressed university to be a fundamentally sound one. It is well accepted that teaching and research must go hand in hand in institutions of higher learning. Thus the idea envisaged in the creation of NSU which would bring together the best of teaching and best of research is an excellent one. There would clearly be arguments about his contention that national laboratories must be devoted to a particular well-defined project and not a larger canvas of activities; but this is an issue that must be dealt with separately and for the present let us focus attention on the proposed structure of NSU.

The NSU is envisaged to be a model university which will have a highly interactive collection of select undergraduate and graduate students and the best faculty available. 'It would reject all feudal values which have plagued our scientific establishment—and thus there would be no scientific leadership by appointment, no hierarchy and it will be a place where a scientist would be independent of his administrative title. It would be an institution where all principal scientific decisions are made by faculty consisting of working scientists. Administrators must take care of administrative matters and scientists of scientific matters. It would be a place where the best of our current scientists will teach, train and inspire the next generation; where scientists can work in a free democratic set up. The NSU aims to become a world class university where the faculty will not simply write footnotes to the work of their Western counterparts and where long term excellence is assured by the continual transfer of expertise to the succeeding generations.'

It is worth mentioning here that Mahajan does ask the obvious questions, namely—what about some of the existing good places in India? Will the NSU become another export house like the IITs? He believes that the NSU could change the turf. If we can offer a good and exciting working environment people will not be exported but would choose to be in this country. We need to add to the existing small number of high quality institutions like TIFR and IISc, the two which he perceives to have a 'lukewarm' commitment to the graduate education and none at all to undergraduate education. While he is thankful that TIFR and IISc exist, he states that the NSU will go even beyond this. How does it go beyond and in what tangible manner? The plan envisages the following:

The plan

1. NSU would like to be located near a major industrial

centre, since it is expected to have a major experimental science component. The locale should be easily accessible by air since NSU would like to have short- and long-term visiting faculty.

2. The NSU would be of moderate size with a total faculty of 100–200 and a proportionate undergraduate population of 800–1500. In addition, there would be 200–400 PhD level students. The NSU will be fully residential for students and faculty.

3. There would be provision in the annual budget of the equivalent of up to US\$ 50,000 for each faculty member in order to cover his research and teaching expenses.

4. The university will be limited to basic sciences, i.e., physics, chemistry, biology, mathematics and computer sciences in the first instance. The development of world class experimental facilities will be a major goal. Allied and adjacent fields like material sciences, earth and environmental sciences can emerge in due course. The faculty will be strongly encouraged to tie up with the industry and to become self-sufficient in the process.

5. Each department will be expected to be fully autonomous while at the same time interacting with other departments so that interdisciplinary interactions come about.

6. The pursuit of science will be the principal activity and the pursuers of science will be the principal citizens.

With regard to the organizational and running principles of the NSU the following points are envisaged in the document:

1. It will have a separate charter without quotas and without binding and suffocating rules.

2. There would be no extra money or other tangibles that would induce a scientist in the NSU to give up active science for an administrative or similar position.

3. Freedom will be granted to the faculty in the pursuit of their investigations and easy access to facilities.

4. The professors would have their own administrative units and thus get rid of central departments such as purchase, stores and the like.

5. Recognition and rewards including cash prizes, medals, media exposure and the like would be an important feature of the NSU.

6. The NSU would be run by an international advisory committee including in its midst a broad range of funding agencies which will advise and help to construct forward looking plans.

7. The faculty of the NSU will retain the principal power for making decisions on all important matters.

8. There will be a Management Trust in charge of looking after the various financial aspects including investment, creation of new avenues for funding, accounting and so on. The Trust will consist of retired academics, intellectually-oriented politicians and intel-

lectually-oriented doyens of industry. The Management Trust will manage and just not ratify.

9. The performance of the NSU will be audited every two years by a panel including international academics.

10. Twenty per cent of the faculty will be mobile. The idea behind this is to encourage connections with overseas Indians and overseas institutions.

This then is a short summary of the NSU. Important in this is the contributions and the component of the nonresident Indians. They are expected to contribute to the corpus fund and to actively participate in the activities of the NSU either thorough short-term appointments or by relocation permanently to India. Mahajan says that a very large number of scientists of Indian origin settled in the West would be happy to spend a part of the year teaching and interacting with motivated and curious students in addition to collaborating with professors. He feels that it is essential that our scientific institutions provide convenient and ever open channels through which 'foreign-based Indians can repay some of their debts to the country of their birth' and adds that the NSU would become an instrument in harnessing this feature. He further stresses that this proposal for NSU 'is not an arrogant, non-resident solution for the ills of Indian science. All competent Indian scientists (living in India or abroad) with vision have an essential commonality of interests and shared objectives'.

Critique

There is no gainsaying the fact that any new university with a fresh approach and commitment to combine research and teaching is welcome. It is also heartening to note that the NSU would like to provide each of its members an annual research budget of US\$ 50,000. Indeed, many of the points made with respect to the basis of the establishment of the NSU and regarding its operation are welcome and hard to find fault with. It is, however, with a touch of sadness that we need to remind ourselves of several points germane to the issue.

1. Let this not be another exercise that underscores the Indian penchant for 'giving up' on old institutions as 'gone cases' and leave them languishing, on the idea that we have to start on a clean slate every time. It would be truly ironic, particularly because the lone science university in India, namely the Indian Institute of Science, Bangalore has had a remarkable history of sustained success.

2. On the same score, why should one drop rules and regulations only for the new NSU; why not do the same even with some existing postgraduate universities? After all, rules and regulations can be changed to suit the situation and newer needs. This would be particularly

welcome not only with respect to the NSU but to the new Central University at Tezpur, Assam and also some of the recent ones such as the Pondicherry University, University of Hyderabad, North Eastern Hill University, Jawaharlal Nehru University, to name but a few. I am not referring to the Universities of Delhi, Allahabad, Aligarh or Benaras not only because they are too huge but they also handle a vast number of undergraduate students.

3. The point that the NSU need to be outside the realm of the UGC is again an example of 'giving up' on UGC. Should this not be the occasion to have a serious review of the charter and function of the UGC and to change it? India is going through a new mind-set and new paradigm of thought not only with respect to its economic and trade policies, but on associated matters as well. This would thus be an opportune moment. It is worthwhile reminding ourselves in this context that the CSIR, itself not a small organization, has gone through an effective review recently and has reoriented its goals, perceptions and modes of activity; in addition, the staff recruitment and promotion policies and salary structure of this organization have also been recently rewritten.

4. The quota system is universally prevalent in the educational institutions in India. The legislators, in their wisdom, have reserved seats for students as well as faculty members based on a variety of sociological considerations. This point has been argued vigorously in academic circles both with regard to the question of infusion of fresh talent and with regard to introduction of non-academic factors. The argument that NSU be free of quota is perhaps a wise one, but why the NSU alone and not some others? The reasons that will be advanced against the quota system in NSU apply equally to several other educational and research institutions.

5. Incidentally, the Mahajan proposal of a quota-free NSU contradicts itself by saying up to 20% of the faculty strength be reserved for NRI scientists. It is particularly on this point of NRI participation in the NSU that a great deal of dust will be raised. Over the years, an informal assessment of the use of having NRI visitors spending varying time in India under the TOKTEN, INRIST and similar programmes suggests that this has not been a uniform success story. Indeed,

there is a certain degree of cynicism and suspicion with which RI scientists look up on such NRI efforts—this is not a statement of judgement but of the situation as it obtains. The nasty question that would be asked is whether the NSU would turn out to be a haven for burnt-out NRI scientists or those who wish to visit India every so often?

6. Indeed, why restrict visiting faculty to NRI's or anyone of Indian origin alone? Why not get the very best in the world; that would be the hallmark of a world-class university which the proposal wishes to build. It is worth recalling here that as early as 1935, it was possible for C. V. Raman to have Max Born spend time at the IISc, Bangalore as a faculty member. Should the NSU not get the very best scientists and researchers from all over the world regardless of whether they are Japanese, European, American, Arab, Indian...? That would be in the true tradition of Indian scholarship—one only needs to recall what the Vedas said; 'Let noble thoughts from everywhere surround us in our place'.

7. A crucial point of concern is regarding the Management Trust of the NSU proposed in the Mahajan document. Why retired academics in the Trust? Why politicians, however intellectually-oriented they be? What is the guarantee that the Management Trust does not become a coterie that Mahajan has put as seen elsewhere—*plus ça change, plus c'est la même chose!* Indeed this composition and complexion of the Trust could very well turn out to be the Gordian knot of the NSU.

8. Finally, no new university or institution near Delhi is advisable. Proximity to the pillars of power can be a temptation both ways. It would only add further to the troubles of a fledgling institution whose Management Trust might contain politicians. In addition, Delhi is no longer a healthy city, having acquired the dubious distinction of being the third most polluted city in the world.

I believe an issue of this importance needs to be discussed and debated amongst the scientists and the teachers of this nation and I am sure *Current Science* would welcome responses from readers.