

UNIVERSITY OF NORTH BENGAL

28th ANNUAL CONVOCATION



Address by

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Chief Guest

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Your Excellency, the Governor of West Bengal, Mr. Vice-Chancellor, Distinguished Guests, Ladies & Gentlemen :

Although my contact with universities has mostly been from a distance, I have had many opportunities of watching for over 40 years the changes in the role of the university system in our national life—both in science and technology as well as in national development. Some of these came when I was Director General of the Council of Scientific & Industrial Research which is a major supporter of university research and preceding that when I was Director of the NPL. Of late, as a member of the Governing Council of the United Nations University, I have had occasion to look at the interactive roles of the university system in other parts of the world. From these experiences, I have framed some impressions that I would like to convey to you.

I would take this opportunity of projecting to you my own views of how universities in general and Indian universities in particular should respond to the forces released by the changing world both at political and global levels. At the political level with the collapse of the Soviet system we have an unipolar interconnected world in which new global issues have emerged. One particularly disturbing issue is ethnic conflicts imposed by tribal or community interest. It is as if suddenly we are experiencing a strong centrifugal force scattering people and communities apart neutralizing the centripetal force initiated and nurtured by science. At the physical level, we have another problem—that of the endangered earth. The earth system is in danger from increase in population, from over-consumption, from irreversible changes of far-reaching magnitude from human activities. Signals of the endangered earth are already there : the ozone hole in the Antarctic, the rapid rise in greenhouse gases, a slow but steady warming of global climate, growing loss of biodiversity, dwindling fuel resources from land and sea, decreasing water availability.

In this context where do the Indian universities stand ?

Let us look at the present scenario. Since independence, universities have increased tenfold. Apart from UGC, financial support is available from a number of agencies, including CSIR, DST, DAE, DBT, DOS. The CSIR alone supports over 4000 Research Fellows, several hundred Pool Officers, and spends some 10% of its budget for university research. There are special programmes for creating research schools. Opportunities exist for taking up technological programmes for the industries. Faculty strengths in most universities are now reasonably large.

With this large canvas, the output is perhaps of some concern.

Nearly forty years ago when India participated in the International Geophysical Year Programme—the first coordinated entry of India into global international efforts—the contributions from the universities (Calcutta, Varanasi, Allahabad, Andhra) were critical and exceeded those from the National Laboratories (NPL, PRL, TIFR, IIA etc.). In contrast, in major new international activities such as the Global Change Programme, participation of (and contributions by) universities are marginal and perfunctory. Several decades of efforts have not succeeded in bringing in university faculties in balloon, rocket or satellite payload development work. Admittedly, there are some excellent schools in material science, in biotechnology, in spectroscopy, in chemical sciences and in modern biology (to cite some examples) in the university system, but those are mostly concentrated in IITs, Indian Institute of Science and some major universities. There are also other bright spots. Of 15 scientists elected to the Fellowship of the Indian National Science Academy in 1995, eight came from the universities (including IITs, IISc, AIIMS). Among the 15 INSA Young Scientists awardees of 1995, six are university people. In social science areas, my knowledge is poor. I am aware of the fact that some of the best economists are coming from the university system. One would expect leading talents in other areas, such as history, political science, literature to come primarily from the universities, since in these areas, national institutions are few.

Several explanations are offered for this unsatisfactory situations ; migration of academic talents to other areas (national laboratories,

administrative systems, banking, foreign countries), isolation, lack of resources, heavy teaching load, inadequate library and laboratory facilities.

While all those are important, I believe the key parameter is isolation, some beyond their control but some self-inflicted.

Isolation comes in different ways. Firstly, there is the isolation from national efforts. There was a period when Indian experimental facilities were primitive, excepting a few conceptually brilliant efforts, and it was necessary, for international-level work, to go to the USA and Europe and spend some time with worldclass instruments. This is not the case any more. There are, in most scientific fields, state of art facilities designed and built in India, such as the Ooty radiotelescope commissioned in 1970, the Mesospheric-Stratospheric-Tropospheric Radar (MST) near Triupati working on full MST mode for the last two years, the Vainu Bappu Optical Telescope at Kavalur, and the Giant Metre Wave Radio Telescope, soon to be commissioned near Pune. But in all of these, in spite of repeated efforts, participation from the universities is poor. In those cases where some interest has been shown, the Professorial staff have considered it sufficient to send students without supervision. This has harmed both the university communities as well as these facilities. We have not achieved scientific outputs commensurate with the cost of these facilities. While two scientific satellites have been launched—SROSS C2, the most recent one, is still in orbit—only a fraction of the data had been analysed for lack of analysis. A training programme being organised by ISRO has attracted little attention from the universities.

The second type of isolation is the lack of information and data base. This is not limited to universities, it is the problem of the entire Indian scholastic community. The information highway is still far from our reach. The ERNET system connecting with INTERNET originally designed for academic communities is subscribed by a small number of groups and, when used, is limited to e-mail purposes only. Data transfer through computer systems or information-hunting through WWW is rarely taken up. Since library facilities are already scarce, and library networking, conceived and spearheaded by UGC, is yet to take adequate shape, electronic networking through any of the several systems now available can make a major change.

I believe one important reason for developing countries like India to fall behind international level is this inadequacy in electronic information networking. In near future, a new hazard will be the decision by many international agencies to switch over to electronic information transfer in preference to hard printouts.

There is still another isolation— isolation of individual groups in the same department of an university. Far too often each faculty member works on a different topic, isolated from other faculty members, with meagre resources, limited backup facilities and lack of continuity. A teamwork in most cases would have produced better results.

The fourth type of isolation is that between different fields both nationally, as also in University system— isolation between physical and biological disciplines, between natural sciences and social sciences, between science, literature and society. In the first half of this century there was a remarkable clustering of unusual personalities in India covering many areas of human endeavour : science, literature, philosophy, religion, politics. I am convinced this happened because the different disciplines took off there shutters during that period.

The next decade will have to work for a total elimination of this isolation. In science, the barriers are already disappearing between physical and biological sciences. The barrier with social sciences is beginning to break. In the 21st century science without social involvement will crumble. The key parameter will be globalization not only in trend but in thinking, in social norms, in development processes, in aspirations. This is inevitable. For one thing, communication revolution has made all countries neighbours and future developments such as video communication, not too far away, are going to get people nearer, make information flow more glamorous and communication across countries instantaneous. Science is seeking to make it even broader by venturing into world outside ours looking for intelligence elsewhere wondering if life on earth is not just a freak phenomena brought inadvertently from outside bodies such as Mars. In this widening canvas, society, science, technology, literature will have to be interactively linked.

The best place to begin is in the Universities, for only here one has a collection of talents in diverse fields, normally sequestered in

their isolated compartments, but, with little efforts—can be made interactive. The problems of the future are daunting : the challenge of economic and social development—one billion people suffering from poverty, homelessness, unemployment and diseases expected to increase to around 8 billion in 2025 AD ; the challenge of the endangered earth, the economy of poverty and hunger, the challenge of tribal and community passions dwarfing global relations ; the spectre of megacities engulfing not only the infrastructure but also the whole fabric of ethos of developing world.

As I said, the Universities are the best place to start. But how does one go about it ? With the syllabus already heavily loaded, it is not easy to bring in an exposure to social science to a science student or an exposure to scientific thinking to a social scientist. Nevertheless, this must be attempted. The University must devise suitable means to effect this. It is not enough to think of new interdisciplinary departments ; these often suffer from lack of resources and suitable faculty. Perhaps one solution is taking up projects that require involvement of widely different disciplines. One such project should be the human dimensions of global change.

The second major step in my view would be the elimination of communication gaps. This should be both through increased uses of electronic networking as well as physical arrangements for increased mobility. In a meeting of the West Bengal Council for Higher Education, I had earlier suggested networking of the infrastructural facilities of the different universities of West Bengal to optimise on library, workshop, computer systems and major instrument facilities.

The third advice would be to identify, nurture and accelerate the growth of a few areas of excellence in each university. One could build on existing core programmes that show promise and also can be sustained over a long period of time both financially and with human resources.

The fourth advice concerns the development of strong schools for mathematical modelling—not just in one area but in several areas, both in physical and social sciences and in areas that involve both. This would require mathematical skill, development of own softwares and modelling methodologies and good computing capability. Of the two major impediments in the developing world, one is the information and data networking and the other is a lack of modern model-

ling expertise. Universities have specific advantages over national agencies in this area and we should make use of this. One might also consider seriously the establishment of an interdisciplinary inter-university modelling centre for West Bengal. Modelling could cover many important areas of concern; population dynamics, natural resources management, economic perspective, environment perspective, future energy scenario, health perspective and so on.

The fifth comment is to generate an internal mechanism within the University to have periodic performance evaluation. I recall several years ago in the Indira Gandhi Memorial Lecture that I gave at the University of Cochin, I talked about judging the performance of a scientific institution. The comments I made there are equally valid for universities such as this one. How should one judge an university's performance? The first is peer evaluation and peer recognition, not official recognition. Look at the Shanti Swarup Bhatnagar Awards introduced more than three decades ago by CSIR to recognise some of our best talents. These are perhaps the most prestigious and sought-after awards in science in this country. The list of the past awardees reads like a who's who of India's topmost scientists. Presence of a Bhatnagar awardee or a fellow of a major scientific academy of the country in the University faculty is an evidence of quality. At the younger level the university should produce young scientist award winners.

For science the final evaluation parameters are the impact factor. One has to examine how good are the publications from the different faculties of an university and make own assessments. Although the way these impact factors are calculated have some problems for developing countries, nevertheless these continue to be the only reference system for judgement.

The third performance parameter that is introduced for CSIR laboratories is the external cash flow (ECF). In the present conditions of financial scarcities, universities cannot ignore the question of ECF entirely. Each University will have to decide how to proceed on this but this could be an additional parameter for performance evaluation.

The strength of any system, in the final analysis, is its people. The university should keep a record of its brilliant faculty and research students and should monitor their progress and their prob-

lems and respond to their requirements. I used to have a list of our most brilliant scientists in the CSIR when I was the Director General of the CSIR.

The university also might like to find ways of associating itself with the activities of the international bodies like the United Nations University. This will allow them to interact with global scholars. UNU's current thrusts are in the following areas :

1. Universal human values and global responsibilities
2. New directions in world economy
3. Sustaining global life support systems
4. Advances in science and technology
5. Population dynamics and human welfare

The major centres of the UNU are : the World Institute for Development Economics Research (WIDER) in Helsinki, the Institute for Natural Resources in Africa (INRA), the Institute for New Technologies (INTCH) in Maastricht, Netherlands, the International Institute for Software Technology in Nasau, Programme for Biotechnology in Latin America and the Carribean and the newly instituted Institute of Advanced Study in Tokyo. There is also a new programme on conflict resolution and ethnicity jointly with the University of Ulster in Nothern Ireland. Most recently an UNU International Leadership Academy has been established in Amman, Jordan.

Ladies and Gentlemen, I have taken the liberty of giving you my views about the universities and their roles today and in future.

I would like to thank you for your attention and the North Bengal University for giving me this opportunity.