

Convocation Address Kalyani University

New Incubators for Tomorrow's Leaders

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New Delhi

His Excellency, Shri. M. K. Narayanan, Hon'ble Chancellor Kalyani University; Prof. Alok Banerjee, Vice Chancellor Kalyani University; Shri. Utpal Bhattacharya, Registrar Kalyani University; Shri Nirendranath Chakraborty; Shri. Dwijen Mukhopadhyay, Dean and Heads of the various Departments; distinguished invitees; all the students graduating today, ladies and gentlemen.

I always enjoy interacting with young students; students who represent untold and infinite potential. Each time I address students at the Convocation ceremony, as they wait to graduate, I find I cannot

shake off the image of aircrafts lining up on the runway, just waiting to take-off. In a way, I suppose the motif is an appropriate one. Just as the limitless sky beckons the aircraft; so too does unlimited opportunity beckon the student; especially in the “flat” world of today. Here only talent and training matter. However, there are at least two major differences between an aircraft and you, a student. There is no limit to how high you can fly and no limit to how far you can go.

I am truly delighted to be here today addressing an audience that is so bright with the promise of tomorrow. In the audience, I can see the happy faces of the young graduates eagerly awaiting the degrees to be conferred. I see also, the quietly satisfied faces of their teachers--the distinguished faculty of Kalyani University. They are the ones who have tempered the steel of youth and fashioned it into instruments that are empowered, and entrusted, to change the course of our nation’s destiny.

To the first group, I offer my congratulations. To the second, I give my thanks...for they are the custodians of a long heritage. They are, by their efforts, keeping the future of the nation well-secured.

Educational Heritage of India

Addressing the audience at a Convocation ceremony always fills me with a tremendous excitement...a sense of anticipation...and hope. I am excited by what the students represent: a brand new generation of Indians educated at a University with a proud legacy of excellence. Of course, education and training in pure and applied sciences has had a flourishing tradition in India dating back over 2500 years.

Under the British rule, the Universities of Bombay, Calcutta and Madras were established in 1857, interestingly the very year that coincides with the first War of our Independence.

It is ironic that while the nation's political liberation was still many years away, institutions that were entrusted to grant education that liberates the mind, were being set up. In any case, this welcome move was not limited to three Universities but continued even after Independence, this time with renewed vigour. The Kalyani University was set up, as you know in 1960. It plays a major role by focusing on

rural economy and the need and aspirations of the youth in the region.

This was a time that witnessed major changes in many areas. Actually there was something magical in the air in the first half of the twentieth century; particularly in Bengal. It is a time that the world recognizes as “The Bengal Renaissance.” Intellectual giants such as Sir Ashutosh Mukherjee, Acharya P.C. Ray, Sir J. C. Bose and Dr. Bidhan Chandra Ray were at the helm of Universities, Centres of learning and research institutions. Their spirit lives on, infusing with forward-looking vision, the higher echelons of education in India even today.

As I stand here addressing you, I cannot but help remembering what Dr. Bidhan Chandra Roy, the spirit behind Kalyani township, said in his Convocation Address on 15 December 1956 at the University of Lucknow. To the students, Dr. Roy said, *"My young friends, you are soldiers in the battle of freedom: freedom from want, fear, ignorance, frustration and helplessness. By a dint of hard work for the country,*

rendered in a spirit of selfless service, may you march ahead with hope and courage... "

If you think about it, the message is a timeless one and one whose fervor has not been diminished by time. This is the hallmark of eternal truth because time is a catalyst that changes everything else.

The Journey Post Independence

The period between 1900-1950 was characterized by an amazing resurgence in Indian Science. India, at that point of time was blessed with globally competent leadership. The dawn of Independence therefore, though fraught with enormous challenges, was also a period marked by hope and tremendous achievements in many fields.

Almost at the birth of the new nation, Pandit Jawaharlal Nehru announced unequivocally that, "*...the future belongs to Science and those who make friends with Science.*" Despite many constraints faced by the nation, an entire chain of National laboratories were established, to cater to growing needs in different sectors. S&T was

used as crucial weapons for economic growth and social transformation. This helped the new nation to consolidate its S&T prowess, which was essential for self-reliance.

A nascent India placed great emphasis on Self-Reliance. So from the 1950s to around the 1970s, Indian science strove not just to meet the needs of the people but also their expectations.

CSIR's Contributions

From the CSIR laboratories came technologies and products that were sorely needed by the newly independent nation. I wonder if you know that the Amul milk powder, that is still a national favorite, owes its genesis to CSIR scientists who stepped in to develop a process to manufacture baby food from buffalo milk when multinationals refused to set up a manufacturing facility citing inadequate production of cow's milk as an excuse. Despite the claims of multinationals that buffalo milk has too high a fat content, India's indigenous baby food had excellent digestibility.

The trend continued with the 20 hp tractor, called SWARAJ that ushered in the era of mechanized agriculture. You will agree that the name is redolent with national pride. Today there are nearly one million SWARAJ tractors tilling the Indian soil alongside CSIR's next-generation Indian tractors called SONALIKA.

The new nation had many mouths to feed and CSIR undertook the task of filling the granaries. It also mounted an integrated programme to develop cost-effective processes to manufacture essential pesticides. Over 70 per cent of the new pesticides production was based, in those days, on CSIR technology.

From the 1970s to the 1990s the nation sought to test its wings to fly free in the sky of science. However, the winds of technology denial were strong. Many developed nations denied India the technology she wanted. The denial was intended to deter India in her quest for advancement.

However, the world forgot that the young never take "No," for an answer. It forgot that not all needs can be denied. Indian science

merely looked inwards and discovered enormous pockets of strength. Tapping the enormous pools of indigenous talent and fired by unwavering determination to overcome, the scientists found ways to overcome international sanctions and technology denials.

This was the time that CSIR-National Chemical Laboratory, Pune, virtually smashed the global barrier that made the manufacture of industrial catalysts such a closely-guarded technology. Starting from developing known catalysts, CSIR introduced its own brand of new zeolite catalysts, named encilites, for diverse industrial processes. It created a large indigenous base for a whole host of industries; be it petrochemicals such as the one in Haldia, or pharmaceuticals or chemicals. Soon, India was exporting catalysts to the world--including to the western markets. Today, India is among the top few countries that possess world class capabilities for development and manufacture of new catalyst formulations.

CSIR also built Flosolver Mk1--the first parallel computer of India, way back in 1986; again an appropriately defiant response to technology denial. The PARAM series of supercomputers was later

assembled by the Centre for Development of Advanced Computing (C-DAC) in Pune. In a diametrically different field, yet one of no less importance to the nation, CSIR National Aerospace Laboratories, Bangalore, created *Varsha*, a hydrostatic spectral general circulation model developed at Flosolver. It is used for modeling weather and forecasting the monsoon. Today India's IT prowess is recognized worldwide.

CSIR also, confidently entered the world of optical-glass manufacturing and since then it has developed 400 different types of glasses including radiation shielding glasses to provide protection from harmful radiation. The CSIR Institute that contributed so much to this cause is celebrating its Diamond Jubilee this year. It is the Central Glass and Ceramics Research Institute and you will be happy to know that it is located not very far from here...in Kolkata.

I could go on and on with the CSIR story! From the tea gardens of Kangra to the bamboo forests of the North East; from the coal mines to the leather and the catalyst industries of India; from building up a new national resource on the genomic profiles of the Indian

populations to topping the list of nations producing generic drugs...CSIR's contributions have always been silently at the service of the nation. Now that India has announced the Decade of Innovation there is the need for timeless innovation enterprise, not only at CSIR, but at all S&T and educational institutes in India, in order to meet the new challenge.

India and the Flat World

One positive result of the efforts of Indian scientists is that the world has been forced to take notice of India's growing strength in S&T. So today, we have many potential partners who are interested to contribute and collaborate on the next Chandrayaan Mission being planned.

Although, complacency has no place in global and knowledge-driven economy, it is pertinent, however, to remember that the triumphant launch of Chandrayaan-1 too has roots that go back to the era of technology-denial and we owe a debt of gratitude to those visionary

leaders in those days who did not hesitate to pick up the gauntlet despite the heavy odds.

Swami Vivekananda, had once said that *“We are responsible for what we are, and whatever we wish ourselves to be, we have the power to make ourselves. If what we are now has been the result of our own past actions, it certainly follows that whatever we wish to be in future can be produced by our present actions; so we have to know how to act.”*

So, today’s developments are a happy footnote to the struggle that our scientist waged in the period spanning the two decades: 1970s to 1990s. It is also an unequivocal message about just how much the world order has changed in the past 50 years. In this change lie the seeds of what our actions should be today, if we aspire for leadership position tomorrow, as well.

One must understand both yesterday and today if one is to plan and to prepare successfully for tomorrow. As you know, the post 90s period was characterized by a wave of Liberalization that swept

through the world. During the next decade, Intellectual Property generation became the new “buzzword”. Global competitiveness held the key to development and progress.

This was only natural since globalization and liberation are directly linked with each other. Today we are at home in a globalized world. Ironically, it was an Indian scientist of colonized India who had articulated the concept as early as in 1927. Sir Jadasis Chandra Bose had said in his Presidential Address at the Indian Science Congress at Lahore, “... *there must also be an unity of all human efforts and in the realm of the mind there can be no boundaries and no separations...*”

Voyaging Confidently into Tomorrow

In 2010, we have arrived at a world that, in many ways, has no boundaries. Our India too is a new India. And you will enter that new arena the moment you step out of this auditorium armed with your graduation certificate. You will be expected to earn your wings in a new global order when you take up the challenges of your first professional assignment.

In today's changed world, geographical distances mean little. Technology has bridged this gap well and the communications revolution has shrunk the globe into a networked village. Lack of resources can be overcome using open-source technology and cloud computing. Even hierarchical set ups can be bypassed using peer-to-peer networking. A huge problem can be broken into smaller pieces and each piece of the jigsaw can be addressed by individuals or teams who bring their diverse skills to bear on it.

You are lucky indeed to be entering a world that is so flat and flexible. However, just being lucky to be around when times are changing is not enough. The trick is to be always ahead of the change. The idea is to consolidate any competitive advantage that we have.

As globalized citizens and Indians, we must blaze new paths, not follow the trail that many have traveled before. You must understand that today's technology will not be adequate for tomorrow's well being. You must accept that though the country today has vast S&T infrastructure comprising national laboratories, institutes, universities

and colleges but not all are future-ready, let alone equipped to anticipate change. You must be ready to rewrite this scenario by becoming the change we want to see in this country.

However, there is no reason to be afraid. You are the proud inheritors of a rich legacy. If you flip the pages of history you will realize that exceptional people have walked the corridors of Indian Universities...the institutes have traditionally empowered minds to soar high. The likes of Ashutosh Mukherjee who was Vice Chancellor of the University of Calcutta from 1906 to 1924; Arcot Lakshmanaswami Mudaliar , the longest serving Vice-Chancellor of Madras University (for 27 years) and his twin brother, Sir Arcot Ramasamy Mudaliar who was Vice Chancellor of Travancore University for eight years are examples of the legendary Academicians India can be proud of. Many of our Universities are following in their footsteps and academic giants still walk the corridors of many Institutes, mentoring the next generation.

Assessing the Situation

However, sometimes simply carrying the banner forward is not enough. This is particularly true at that point of history which marks the ending of an era and the beginning of another. The present period is one such time, when traditionally established subjects, that used to be studied as if these were water-tight compartments, are suddenly becoming fluid. Traditionally established areas of studies are merging and evolving into a new avatar...and emerging as new branches. For example, Computer science (itself a new area of study) has merged seamlessly with Biology to emerge as the subject of Bioinformatics.

Another matter of grave concern is that, according to the India Science & Technology 2008 report published by CSIR (National Institute of Science, Technology And Development Studies), over the last few years the growth of highly specialized manpower (Ph.D) has been much less than the growth in graduate S&T manpower.

India's leadership in science and engineering of tomorrow would depend upon its strengths in interdisciplinary and trans-disciplinary areas of science. Countries such as China and South Korea, which were once behind India in their scientific output, have not only overtaken but also are well ahead of India. Our country is likely to lose a large number of students interested in interdisciplinary areas to other countries unless similar opportunities are created indigenously.

This problem is further intensified by "brain drain" or the migration to other countries. This means that there will soon be a critical shortage of appropriately trained, highly educated young talent in science and education. We need to immediately invest resources to build new centres of learning, which will act as generators of knowledge and provide world-class training in the appropriate areas. Such centres of learning must also equip the students to be able to not merely cope, but to provide leadership in emerging areas in these times of change.

Under such rapidly evolving conditions, as we are witnessing today, it is necessary to recall that philosophers have always held that continuity gives us roots and change gives us branches, letting us

stretch and grow and reach new heights. We must remember that India has always reacted in an exemplary manner when faced with apparently-insurmountable problems.

The Academy of Scientific and Innovative Research (AcSIR)

It is universally recognized that S&T is the driver of economic growth. So, a high standard of science education is mandatory if our forthcoming S&T efforts are to be crowned with success. It is clear to all educationists that the S&T of the future will be multi-disciplinary. Tomorrow's Science will demand an integrative and trans-disciplinary approach. It is clear that there is the need to create a structure which can leverage development of desired Human Resources and pursuit of R&D through involvement of young minds.

In an attempt to “grow to reach new heights”, and in keeping with CSIR's tradition of being prepared for the future, we have establishment of an Academy for furtherance of the advancement of learning and prosecution of research in the field of science & technology.

This *Academy of Scientific and Innovative Research*, called AcSIR for short, places special emphasis on emerging areas and on such areas of inter-disciplinary and trans-disciplinary nature that are not ordinarily taught in regular universities. The Academy has been conceptualized as a one-stop solution to synergize education, research and innovation on cutting-edge trans-disciplinary areas of science and engineering.

The Academy perceives a natural advantage as we believe that the opportunity to work on the frontier and trans-disciplinary areas will attract the best of the young minds, thus creating reversal of brain drain. It will also place an army of highly skilled and well-trained personnel at the service of the nation. We will be well-placed to harness the natural and engineering sciences into interdisciplinary and trans-disciplinary pathways for directed and translational research; and be favourably placed to create global technological niches.

India desperately requires a critical mass of qualified human resources that would be crucial to capitalize on the ensuing Asian economic boom. I am sure that this Academy with its unique nature, structure and knowledge base shall effectively complement our other higher education institutions in achieving this critical mass. Kahlil Gibran once said, about teachers that, *“If he is indeed wise he does not bid you enter the house of wisdom, but rather leads you to the threshold of your own mind.”* This is exactly what AcSIR proposes to do...help you to realize the full power of your potential so that you can carve your name on a global template.

Kalyani has always enjoyed the distinction of being regarded as, “...university town...” because it has two universities namely, Kalyani University and Bidhan Chandra University of Agriculture and many other educational institutions. It is currently witnessing a resurgence of developmental activity on the academic front. Two new institutes namely; National Institute of Biomedical Genomics and the West Bengal University of Technology are slated to begin functioning here shortly. Once this happens, there is no doubt that the academic climate in Kalyani, will be charged with new excitement.

I hope that the cluster of educational institutions; old and new, will contribute towards making history repeat itself. I hope that Golden Bengal, renowned for providing enlightened leadership to India will emerge once again.

In summation I can do no better but to repeat the message of Vivekananda, *“Arise, awake and stop not till the goal is reached.”*

Thank you