



*3<sup>rd</sup>*  
*Convocation*  
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Commencement Speech  
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Mr. Chancellor, His Excellency, Shri. Murlidhar Chandrakant Bhandare, Governor of Orissa, Vice Chancellor Devdas Chhotray, Madam Registrar, Dr. Smarapriya Mishra, CCD Dr. Nihar Ranjan Patnaik.

Distinguished honorees, Dr. Chitta Ranjan Das, Mr. Prafulla Mohanti and Mr. P. V. Krishnamoorthy, Mr. Jatin Das and Mr. Pavani Parameswara Rao, the faculty and staff, and, most importantly, the bright young graduates of the class of 2009, their parents, relatives and friends.

I wish to especially acknowledge and congratulate the parents, for your encouragement and support to your children. Your patience and trust for the success of your children, makes a day like this possible. More importantly, this is a day for you to rejoice, since you have provided the last tuition fees for your child.

I also wish to commend the faculty for their dedication and commitment to shape the minds of the graduating class, preparing them for an enlightened future, and instilling the important values of life, such as honesty, integrity, trust, self esteem, humility and to be proud to be a citizen of this great country and the state.

I have the distinct honor to address this assembly, with great pleasure and humility to congratulate you all, on this memorable day of your life. You should be rightly proud to graduate from the most prestigious institution of the state, and indeed one of the prominent universities of India.

The university known earlier as the Ravenshaw College has a heritage going back 140 years of highly distinguished history. Its hallowed halls echo the declaration of Orissa, as a distinct province of India, housed the first state assembly for the governance of the state. Functions of Utkal University began on this campus. The State Museum and the famous Madhusudan Law College outgrew from these grounds. Most of the eminent framers and policy makers of the state, literary luminaries, scientists and engineers, are graduates of this institution. Going back too many years, I as a young man like you, graduated from this college, and so did my father during the second decade of the last century.

During the fourth quarter of the last century this college went through some difficult times. While the nation was expanding its educational infrastructure, it was indeed surprising to watch some of the prestigious

institutions of the nation, including the Allahabad University and the Presidency College, among others, being neglected, in striking contrast to the leading Universities of the western world, many of which were founded more than a thousand years ago and have consistently maintained their preeminence.

I am deeply gratified to see the new leadership of Ravenshaw University is bringing a renaissance with new ideas for renovations.

Although, the founding fathers of the state have established a framework for its economic growth and improvements on quality of life, there is a lot of work to be done, and that falls on you, the future of the state.

As examples: (1) the state is endowed by nature with an abundant supply of water. Nearly 10 to 15% of the nations fresh water flows through its rivers. And yet, the only consequence of this supply is floods and devastation. (2) The large resources of minerals and ores are only dug out of the ground, and shipped abroad, when they could be processed here in the state to various consumer products. (3) Mahanadi River Basin has large deposits of natural gas, which could be explored for national use instead of importing natural gas from abroad. (4) Without use of improved predictability and infrastructure developments, the coastal regions of the state are frequently destroyed by cyclones and super cyclones. The large loss of life and property could be saved with appropriate implementations of technology and resources. These are a few examples of challenges, including air purification, clean water, and food that your generation could address.

I am sure all of you know that learning does not end at graduation. It is a life-long process, particularly in these times, when new technologies are growing exponentially and information is exploding at a phenomenal rate.

As an example, during the 50-year period, between 1900 and 1950, information doubled. During the following 30 years, between 1960 and 1990, the information doubling time reduced from 50 years to 5 years. By 2020 the information avalanche is expected to double every 73 days.

This phenomenon can be called “our expanding digital Universe”. Between 2006 and 2010 the information added to the digital universe will expand six-fold. In other words, the Internet is bombarding one million words per second to the brain, which can only process ten (10) words per second.

In your professional career, I advise you to follow your dreams. Foster a culture of invention, innovation, collaboration and creativity. Shape your future and the future of your communities. Never be deterred by the naysayers among your pessimistic peers.

Looking into ones crystal ball to predict the future is often risky and dangerous. One has to be either a fool or a genius to venture into that field. Let me give you a few examples of naysayers. Some industrial giants, and scientific luminaries made the following predictions.

- Lord Kelvin, one of the great scientists, said (1895) “Heavier-than-air flying machines are impossible.”
- Ferdinand Foch, The French Marshall, and negotiator of armistice terms to close World War I, (1918) said “Airplanes are of no military value”
- A proposal of David Sarnoff, the pioneer of radio and television, was rejected in 1920 with a statement: “A wireless music box has no imaginable commercial value.”
- New York Times (1921), commented on the subject of propulsion in the vacuum of space, and I quote, “Professor Goddard seems to lack basic knowledge in Physics taught to high school students.”
- Tom Watson, IBM Chairman (1943) said, “There is a world market for maybe five computers.”
- Bill Gates, the founder of Microsoft, probably the richest man in the world (1981) said: “640 Kilobytes ought to be enough for anybody.” (Today 64 gigabytes is common in computers.)
- The Office of Management and Budget of the United States (OMB) wrote “GPS (Global Positioning System) will have relatively few users – not worthy of federal investment.” (As you know, GPS has become one of the lifestyle altering innovations of the second half of the 20<sup>th</sup> Century. With a hand held device you can determine your exact position and the way to the destination you wish to reach.)
- In 1956 Dessauer, the inventor of plain paper copiers (now commonly known as Xerox machines) was rejected by IBM consultants, who claimed that there was no market for plain paper copiers. (Now it is a several hundreds of billion dollars per year industry.)

- In 1980 it was said: Personal Computers (PC) will never be successful. They are for hobbyists – who would ever want a personal computer at home? And if they got one what will they do with it?

Imagine where we would be today if the inventors would have listened to these predictions.

Some 40 years ago, an elderly gentleman come to see his physician with his heart problem - due to an erratic heart beat - the doctor, after examining him, said that, there are new technologies that may cure your problem. There are compact computers with batteries, size of a cabinet, which can be wired to your heart muscle to cure the fibrillation. I can open your chest, but don't know how to insert a cabinet size computer into your chest.

(Today a tiny pacemaker is regularly inserted to the heart to remedy the problem.)

Many facilities we take for granted today, were not even imaginable or conceived 30 years ago. Some examples are:

- Building transistors the size of 25 nm, enabling Central Processing Units (CPU) containing 2 million transistors.
- Detection of single molecule of a chemical or biological agent in real time.
- Rapid detection of harmful chemical and pathogens in air, water, and humans.
- Extracting perpetual energy from the ocean sediment using microbial fuel cells
- Hybrid vehicles running on electricity and fuel cells, reducing transportation cost.
- Teleworking from anywhere using the internet and wireless handheld phones, among many others.

I do not think I belong, in either end of the intellectual spectrum. However, I will predict some things to come, in the next 25 to 30 years, for which you may either be the inventors or the users. You may blame me, if they do not happen, which will not matter, of course, since I will be long gone by then.

Some of these transformational technologies are:

- Computers combined with mechanical systems will be aware of their environments and will interact with humans using natural language
- Artificial cognitive systems will respond to emotions and interact with humans
- Clean water technologies will enable faster and more energy efficient treatment of fresh water, waste water and desalinization of brackish and sea water, usable for domestic, agricultural, and industrial purposes.
- Advanced energy storage technology will collect energy from multiple sources and deliver on demand
- Embedded miniature computers in the human system will communicate through the Internet, and report chemical imbalances in the human system.
- In vivo devices will monitor drug requirements and provide controlled release upon demand
- Functionalized nanoparticles will congregate around tumors, and cancer cells, and selectively suppress their growth through localized imaging, diagnostics and therapeutics
- Using recombinant DNA technology, protein therapy will eradicate most hereditary diseases such as diabetes, hemophilia, cancer and others.
- The same technology will produce genetically modified foods, resistant to blight and having improved nutritional qualities
- New adaptive polymers, with shape memory, will be capable of self-correction and self-repair
- Killing trees to produce paper will be obsolete
- Our cities will be lit using light emitting diodes (LEDs) consuming 300 times less energy than incandescent lamps
- Micro UAVs, the size of dragonflies, will provide surveillance, and perform peacekeeping missions in urban environments

- Oceans will be the huge frontier to meet many of the societal needs

These are but a few of the game changers that the future will bring, and hopefully some of you will be engaged in these enterprises.

There are many more future challenges driven by societal needs, such as 1) Alternate Energy Sources, 2) Water, 3) Environment, 4) Disease, 5) Education, 6) Counter Terrorism and War, among others.

Problems on energy, for example, will be paramount in your lifetime, when, around 2025 to 2030, the world's oil reserve will reach a peak (a maximum of about 100 million barrels per day), and the supply will no longer meet the ever increasing demand. Alternate energy sources will be essential for our continued prosperity.

Technology has eroded national boundaries. As a result of advancements in the globalization of the Internet, it is now a common practice to outsource manufacturing, education and services. Communications, at the speed of light, allow us to engage in dialogs with people at the other end of the earth, as if they were next to us.

A book written by Thomas Friedman, called "The World is Flat: A brief History of 21<sup>st</sup> Century", is worth reading. The author of the book was visiting a company in Bangalore. Upon arrival, the author asked his host "What work do you do? The host responded, that he does tax accounting, and if interested, he will be happy to do Friedman's tax work. Friedman thanked him and said that, a company in Chicago does his taxes. After learning the name of the company in Chicago, the Indian host politely replied, "Oh, then indeed I have done your taxes."

The point of this story is to tell you that work opportunities transcend national borders and you can be engaged on global problems and challenges without leaving your home base.

Allow me to say a few words on generosity and altruism. Going back in history, founded on culture and tradition, generosity and charity have been the cornerstones of the conduct of the people of India.

There is no nobler act, than selfless giving, and no greater goal than promoting education and knowledge for the people.

Great visionaries of India, to name a few, such as, Madan Mohan Malviya, Annie Besant, Jamshedji Tata and Rabindranath Tagore, and many others, had a passion to build educational institutions in spite of numerous hurdles, posed by the then British Government. Following many objections, an impossible task was given to Malviya by the British Government, which directed that 50 Lakhs must be collected in exactly two years before approval would be given to him to build a university. Remember, 50 Lakhs was no small sum in 1912. Well within two years (1912-1914), Malviya collected from private charitable donations the amount to initiate, what we know today, as the Banaras Hindu University.

In the Western World, some of the great educational institutions, such as, Harvard, Yale, Princeton, Stanford and Cornell (the alma mater of your vice chancellor) in the United States, Oxford, Cambridge and Imperial College in U.K., and Sorbonne in France predominantly built their financial resources from charitable endowments contributed by their alumni.

India no longer has great benefactors and landowners like Kashi Naresh, Maharajas of Mysore, Kanika and Maurvanj. The challenge is on the shoulders of people like you, to dedicate a part of your time and resources to maintain the preeminence of your alma mater, The Ravenshaw University.

I have no doubt that you will remain a proud alumnus of this great institution.

In conclusion, I wish to cite a quotation from Mark Twain, who more than anyone understood the human spirit and the power of optimism:

“Always work like you don’t need the money, always love life like you have never been hurt, always sing like nobody is listening, and always, always live like it is heaven on earth.”

Again, my heartiest congratulations.

Best of luck, thank you.