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AFFAIRS AND SCIENCE & TECHNOLOGY, GOVERNMENT OF
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May I begin by thanking Chief Minister, Shri Bhupinder Singh Hooda for encouraging us to take this initiative of holding Annual Science Conference for students of Haryana. I also thank Kurukshetra University, its Vice-Chancellor & Faculty as also my colleagues in the Department of Science & Technology for conceiving and implementing this idea on an annual basis in collaboration with the Kurukshetra University. We began last year with Birth Centenary of one of the most illustrious sons of India - Dr. Homi Jahangir Baba – Father of Indian Atomic Programme. This year, we have deliberately decided to concentrate upon ‘Role of Basic Sciences’.

This is among the youngest countries of the world with 52% of population below 40 years of age with unimaginable quest of knowledge and insurmountable number of ideas. It is also a fact that every young man and woman today wants to be a successful engineering graduate, a doctor or a management graduate and post-graduate today on account of their inherent potential in making a successful career. This has resulted in a drastic decline of students and researchers pursuing basic science streams and research programmes. Onus today lies on academicians, teachers, universities, State Governments, Central Government and a broad range of corporates interested in the future of India to rekindle the fire of basic science, research and innovations.

WHY BASIC SCIENCE?

Fundamental science is the gateway for future innovations and discovery. Basic science helps us innovate, dream and attracts dreamers and innovators into science.

It is a fact that short term contributions to society of fundamental science is only 'knowledge', most of times without any immediate application. It does not necessarily pay off immediately. It may not pay off for years and when it does, its rewards is shared and enjoyed by society at large without being restrictive to those who spent years of hardwork. This is one reason for lack of primary and basic research as also attraction to basic science.

Look at, however, the other side, there would have been no growth, no progress, no innovation and perhaps not even the world, as we see today, but for basic science and basic research and May I quote a few examples:-

- * A 'solar cell' now called 'Photo Voltaic Cell' converts energy of sunlight into electricity by the 'Photo Voltaic Effect'. A number of such solar cells make a solar panels and energy so produced is 'Solar Energy'. First solar cell was built in 1883. Photo Voltaic Effect was explained by Albert Einstein in 1905. In this century, it shall become the primary driver of energy. In 128 years, this research is finally becoming meaningful enough to provide us the cleanest source of energy.
- * Mapping human genome started in 1911 when red-green colour blindness was assigned to x-chromosome. It took off in 1970s and an international scientific project on human genome project began in 1990. Think about the number of ways in which we can treat diseases from Cancer to Heart by this innovation.

- * Think if Arya Bhatt had not discovered 'zero', what would have happened to the whole foundation of computing science, mathematical evolution and computers? Think if Sir Isaac Newton had not discovered the theory of gravity, what would have been its consequences to the entire human evolution.
- * Think if electrons had not been discovered by people like **Thomson** and **Lorentz**, what would have happened to the entire electronic industry?
- * Think if '**Max Planck**' and '**Elbert Einstein**' had not contributed to nature and behaviour of energy and matter by quantum theory of solids, could transistors have been discovered? If there were no transistors, what would have happened to the entire communication revolution?
- * Without the worldwide web and internet, would it have been possible to share information, knowledge and innovation that is multiplied and shared in the manner, we do today.
- * Only in today's newspaper, NASA's Kepler Satellite has released a list of 1235 potential planet orbiting sun like stars with 68 planets that are the size of earth and 54 planets in the so-called habitable zone. Think about its impact on the entire human evolution in decades to come.

AND these examples can be multiplied many times over. This, my friends, is the entire beauty of 'Basic Science & Research', which are the main drivers of innovation, growth and prosperity.

Pt. Jawahar Lal Nehru once said and I quote, "Future growth of science is growth of civilization." It is basic science that helps us develop and adapt technology to our local circumstances. Green Revolution in India is one such example. Technology to preserve, technology to grow more, technology to

fight plant diseases can help us eradicate hunger. A downside of excessive use of pesticides and fertilizers has resulted on account of abuse by commercial interests on account of lack of knowledge and on account of our failure to make the optimum use of science and technology.

It is also true that for producing the best talent in health and education, science also helps us to choose between one or more options. For example, AIDS, which is the greatest challenge for health researchers across the country and world, we can either target an expensive treatment or the entire humanity can work towards finding a cheap vaccine against AIDS just like Polio and this is how science accelerates progress.

CHALLENGE AHEAD

Challenge really lies in today's world in promoting science, scientific discovery, understanding of scientific issues and finally scientific literacy. Without the same, future of mankind would itself be under a cloud. It has to be a joint effort inter se the government and, as I said earlier, academicians, researchers, universities, corporates and finally the ignited young minds. That challenge and that onus, my young friends, lie on your shoulders to make this State, this country and this universe a happier, innovative and more prosperous place.

JAI HIND."