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ACHIEVEMENTS OF WOMEN SCIENTISTS AND ECHNOLOGISTS

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India the land of ancient varied culture tradition, and people of highly civilized Society ,who were rich not only in tradition and culture but also Science and technology have been an integral part of Indian civilization and culture. Women and men have been active in science from the inception of human civilization. One of the defining marks of humanity is the ability to affect and predict our environment. Science is the creation of structure. For our world and technology, the use of structure has been stepping stone to our progress. Women and men have researched and solved each emerging need. At a glance, women in general might look like one of the many housewives – simple, docile, unassuming and humble. But make no mistake, for behind this simple straight face is a razor sharp brain, and an uncanny ability to execute, to convert thought into action without much ado.

Since Independence, Indians have been promoting science and technology as one of the most important elements of national development. The Scientific Policy of 1958 and the Technology Policy Statement of 1983 enunciated the principles on which growth of science and technology in India has been based over the past several decades and inspires us till date. The major scientific revolutions of the last century have opened the doors to many remarkable technologies in the fields of health, agriculture, communication and energy, among many others. Science and Technology are powerful instruments in the tasks of national reconstruction, economic resurgence and maintenance of national security.

The very first technical name was male – Imhotep – the architect of the first pyramid and the second was female – En Hedu' Anna (c. 2354BCE). Certainly women were questioners and thinkers long before that, but unfortunately it was an untapped resource most myths and religions place the beginnings of agriculture, laws, civilization, mathematics, calendars, time keeping and medicine into the hands of women. Women contributed in all the spheres of technical advancement of humanity. They held the same burdens of scholarship as the men did, and accomplished just as much. Women were and are resourceful, passionate and creative about their work as any other male scientist.

In the 17th, 18th and 19th centuries most women did not have access to institutions of higher learning and laboratories, which prevented them from participation in the scientific revolution. The singular exceptions in the 19th century being Mary Somerville and Agnes Pockels. The Academie des Sciences of Paris, The Royal Society of London did not allow women into their meetings and were strictly male bastions. The Academie des Sciences of Paris was founded in 1666 and elected its first female member in 1962, The Royal Society of London was founded in 1662 and elected its first female member in 1945. These societies were important meeting places for the observation of new experimental results and the discussions of new ideas.

The Third World Organisation for women in Science (TWOWS) officially launched in 1993, is the first international forum to unite eminent women scientists and scientific institutions in the South, with the objective of strengthening their role in the development process and promoting their representation in scientific and technological leaderships.

Although we are a traditional country where women are respected as " MatriShakti" over the years women have overcome the traditional mind sets and have excelled in professions like teaching, medicine and pure sciences. Women have made important contributions in all walks of life and made inroads into new fields like engineering and information technology. Of the women science

graduated 88 % of the science degree holders are in pure science, 8% in medicine and 3% in engineering and technology.

However, there has been a recent spurt of women joining the engineering and information technology fields. The field of biotechnology has revolutionized the industrial growth of the world. In India, our own Kiran Mazumdar is an example for women entrepreneurs to follow and emulate. Kiran Mazumdar Shaw, biotech entrepreneur and CEO of Biocon India group, is one of the many scientists India should be proud of. She started Biocon in 1978 collaborating with an Irish firm, started two joint ventures, Biochemizyme and Biocon-Quest India Ltd. She has held positions in industry councils, including Vice-President, Association of Women Entrepreneurs of Karnataka. She was awarded Rotary Award for Best Model Employer, National Award for Best Small Industry and most noteworthy is the Padmashri in 1989 from the Government of India. She was accorded a very prestigious assignment as a Chairperson of the Vision Group on Biotechnology to draw up the State's Biotech Policy.

In 1978, the world's first test tube baby, Louise Joy Brown was conceived. In India, Dr Indira Hinduja produced first scientifically documented test tube baby. In 1986, India's first test tube baby Harsha was born. Female ovum is fertilized with male sperm in a test tube, with suitable environmental conditions, and observed under microscope for more than three days. The fertilized egg is then put back into mother's womb and hence called test tube baby. Producing test tube babies is not an easy task even in advanced countries, Dr Indira Hinduja has rejected opportunities to settle abroad so that she can serve our country/India.

The world's first programmer was Lady Augusta Ada Lovelace of England in 1852. She is credited with telling a machine what to do by using punch cards to programme algebraic patterns. Indian women have excelled in almost all fields which hitherto were fortified by men. Women are storming Information and Technology field and in the late nineties the number of women in computing and internet industries has registered a sharp rise. The IT landscape is full of women who are busy writing programmes, running network systems and delivering

applications to clients on time. Recently a Japanese magazine concluded that Indian women are number one amongst women from various countries in acquiring and applying IT knowledge.

Deb Agarwal, a top scientist at a national laboratory and Radha Ramaswami Basu, a high-tech entrepreneur, are the two Indian women among the top 25 women on Web award winners for this year. Agarwal, a computer scientist at the Lawrence Berkeley National Laboratory, serves the comprehensive Nuclear Test Ban Treaty Organisation as an expert in the area of reliable multicast communication. Basu is CEO, www.support.com. She was general manager for international software at Hewlett Packard. She is also the co-founder of Maitri, an empowering organization for South Asian Women in the Bay Area.

In June 1963, Valentina Tereshkova, the first woman astronaut, made 48 orbits in Vostok 6. Sally Ride and Kathryn Sullivan along with five men were aboard the space shuttle Challenger in 1984 for the first time. It was the first time a US woman Kathryn Sullivan walked in space. Kalpana Chawla from Haryana was qualified from over 2962 applicants to earn herself a place in space shuttle Columbia for a 16 day out of the world experience. The NASA chief called her a "Terrific Astronaut".

Women have also accepted the challenges of the oceans and have participated in expeditions dealing with ocean research. Dr Aditi Pant is the first Indian woman to participate in the cruise to the icy continent, Antarctica. The expedition was for a period of 4 months and the participants had to explore this continent under rough weather conditions.

Shahnaz Husain is the mother of all herbal cosmetics in world. Her creams and lotions have found their way into salons in different parts of the globe. She has 650 salons at 104 countries. It is all due to her sheer innovation, determination and hard work.

Madhuri Mathur, an intelligent lady made the life of ladies in kitchen easier by bringing out the idea of, a kitchen machine that would blend, chop, mince and grind that culminated into sumeet mixer.

The role of women in the armed forces for a long time, was limited to the medical profession i.e. doctors and nurses. In 1992, the doors were thrown open for women entry as regular officers in aviation, logistics, and law, engineering and executive cadres. Although the path these women have chosen is tough, they have proved that they have the spirit, the courage and the will to carry on.

There is no doubt that we are in the midst of a great revolution in the history of women. The evidence is everywhere; the voice of women is increasingly heard in Parliament, courts and in the streets. While women in the West had to fight for over a century to get some of their basic rights, like the right to vote, the Constitution of India gave women equal rights with men from the beginning. Unfortunately, women in this country are mostly unaware of their rights because of illiteracy and the oppressive tradition. Names like Kalpana Chawla: The Indian born, who fought her way up into NASA and was the first women in space, and Indira Gandhi: The Iron Woman of India was the Prime Minister of the Nation, Beauty Queens like Aishwarya Rai and Susmita Sen, and Mother Teresa are not representative of the condition of Indian women.

Although there is no disparity existing in the emoluments of male and female scientists and technologists an imbalance does exist in the decision making policies and in the exercise of authority which is solely dominated by men. Women do not get scientific recognition and are rarely recommended and nominated for awards, expertships. But the pattern occupying positions of authority has changed progressively during the past years and the trend appears to be encouraging. Many women with high qualifications and experience have reached the top. From these observations, it can be concluded that given the requisite qualifications and opportunities the women in science and technology in India can be achievers and thereby boost the growth of science and technology of our country.

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