



# DREAM 2047

April 2002

Vol. 4

No. 7

## VP News

### Science Communication Through WorldSpace Radio

A new beginning is being made to utilize the WorldSpace satellite digital radio system for science and technology popularization in the country by Vigyan Prasar in association with WorldSpace. In the days to come, Vigyan Prasar hopes to utilize this powerful technology of satellite digital radio communication for science and technology popularization, and for education and management of natural disasters, and so on, along with other established technologies. The signals are received directly from ASIASAT - one of the three WorldSpace geo-synchronous satellites placed at 120 degrees apart at a height of 36,000 kilometres.

On May 06, 2002, three talks on different aspects of science and technology communication, interspersed with slides would be broadcast. Visuals can be viewed by downloading the files in advance using your radio sets and a personal computer attached to an adapter card or from our web site [www.vigyanprasar.com](http://www.vigyanprasar.com). The first talk would be by Professor V.S. Ramamurthy, Secretary, Department of Science and Technology, Government of India, and a noted nuclear physicist of the country. His talk will cover various aspects of science of communication. Second talk would be by Dr. Narender K. Sehgal who is primarily a science communicator. He is recipient of the prestigious Kalinga prize of UNESCO for science popularization. He was the founder Director of Vigyan Prasar. He would speak on various aspects and activities of science and technology communication in the country. The last talk would be by Dr. Vinay B. Kamble, Director, Vigyan Prasar. He would talk to us about the various activities of Vigyan Prasar.

### All About Having A Baby

The birth of a baby in a happy, healthy family means that the bond between husband and wife has come of age. Together you create a new human being who embodies a part of each of you-your bodies, minds, and spirits, and is in a true sense, your own vision of yourselves carrying on your love and work and life into the future.

The moment conception occurs, the mother takes the responsibility of nurturing the seed of life. Bit by bit, cell-by-cell, perfused by her arteries the tiny fertilised egg grows into a complete baby! A single cell grows and matures into billions of cells; still each baby is unique.




Finally, the big day arrives. You take up a new role. Bringing up that helpless bundle of life has both its rewards and punishment. The sleepless nights, the splitting headaches are salved when the baby smiles or when those tiny fingers clasp yours. Knowing the simple rules of baby care prepares you for the tasks that lie ahead.

This book packs the present-day modern knowledge about conceiving, carrying and caring of your baby without renouncing the wisdom of old. It sifts facts from myths and fulfils the role of a friend who has the answers to most of your questions.

All About Having a Baby : Dr. Yatish Agrawal & Rekha Agrawal, Published by Vigyan Prasar, 2002, ISBN 81-7480-074-3, PP 243, Rs. 195 Paperback edition: ISBN 81-7480-078-6, PP 243, Rs. 95

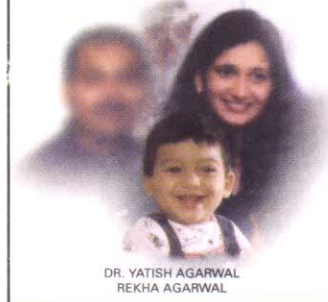
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### All About Having A Baby

A Step-by-Step Guide on Pregnancy and Baby Care



DR. YATISH AGARWAL  
REKHA AGARWAL

...think scientifically, act scientifically ... think scientifically, act scientifically ... think scientifically, act...



## The Great Indian Arc of the Meridian

Two hundred years ago, 10 April, 1802 to be precise, a daunting and audacious scientific endeavour began in our country. Called "The Great Indian Arc of the Meridian", it was the longest measurement of the Earth's surface ever to have been attempted. The idea was to map the entire Indian sub-continent and determine the exact curvature of the Earth. The intrepid band of the surveyors, initially under the leadership of Colonel William Lambton and after his death in 1823 under Sir George Everest took fifty years to traverse 2400 kilometres from Cape Comorin to Dehra Dun along the 78° East longitude. It is said that the inch perfect survey along the entire path took cost more lives than most contemporary wars, and involved equations more complex than any in the pre-computer age! It has been hailed as 'one of the most stupendous works in the history of science'. Through hill and jungle, flood and fever, the survey carried the Arc from the southern tip of the Indian subcontinent up into the snows of the Himalayas. William Lambton, an endearing genius, had conceived the idea; George Everest, an impossible disciplinarian, eventually completed it. Malaria wiped out whole survey parties; tigers and scorpions also took their toll. Besides the physical hardships, the technical difficulties were enormous. Their measuring instruments - theodolites, weighed half a ton, and observations had often to be conducted from make-shift platforms ninety feet above the ground or from mountain peaks enveloped in blizzard. A theodolite needed 12 men for carrying it around. Using these monstrous instruments, the survey covered the country with multiple strings of triangles in the north-south and east-west directions. Such surveys extensively employ application of trigonometry. Consequently, this gigantic project also came to be known as "The Great Trigonometric Survey".

In 1843 Andrew Scott Waugh took charge of the project as Surveyor-General, and gave special attention to the Himalayan peaks. Because of clouds and haze, those peaks are only rarely seen from the lowlands, and until 1847 few measured sightings were achieved. Even after they were made, the results had to be laboriously analyzed by "computers" performing trigonometric calculations in the survey's offices - of course human computers, not machines! In 1852, Waugh's team succeeded in observing the highest peak in the world, its height being calculated at 29,002 feet (accepted height now is 29,035 feet or 8850 metres). From a distance of over 160 km, the peak was observed from six different stations, and "on no occasion had the observer

suspected that he was viewing through his telescope the highest point on Earth." Originally it was designated as Peak XV by the survey, but in 1856 Waugh named it after Sir George Everest, his predecessor in the office of Surveyor-General. Everest was the one who commissioned and first used those giant theodolites. They are on display in the Museum of the Survey of India in Dehra Dun. It was the Chief Computer, Radhanath Sickdhar (that is how he spelt his name!), who first realized that Peak XV was the world's highest.

Now we can determine the position on Earth accurately using the global positioning system (GPS) of 24 satellites in precise orbits, constantly broadcasting their position. A small hand-held electronic instrument receives their signals and gives one's position quite accurately. A great deal of trigonometry is involved, but all calculations are done by a computer inside the gadget. The Great Arc made possible the mapping of the entire Indian subcontinent and the development of its roads, railways and telegraphs. The Great Trigonometric Survey can be considered as foundation of all the topographical surveys. More important still, by producing new values for the curvature of the Earth's surface, the Arc significantly advanced our knowledge of the exact shape of our planet

To commemorate the great expedition, the Survey of India has chalked out a year-long programme. The major events would include a Treasure Quest, Geo Quest Quiz, Great Arc Exhibition, Great Arc Documentary Film Series, and Great Arc Pictorial publications and so on. Indeed, this event could be utilized to generate an interest in mathematics and study of geography through a host of activities like students' projects in measuring heights and distances using method of triangulation and applications of principles of trigonometry, mapping local areas with the help of civil engineering departments of engineering colleges, field trips for familiarization with the local terrain - say, forest cover, water bodies, agricultural patterns, alongwith lectures and demonstrations, essay competitions, and so on. This is yet another opportunity, especially for the VIPNET clubs, to popularize science with activities built around the Great Arc of India. Indeed, it would be a fitting tribute to Lambton, Everest, Waugh, Sickdhar and countless others who helped define our country as we know today.

□ V. B. Kamble

Editor : V.B. Kamble

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