Space and the common man

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When the Sputnik was launched in 1957, there was a mixed reaction from the common man. There were those who were thrilled by the achievement that put a man-made satellite in orbit around the earth. There were others who saw a sinister motive in the action, of converting space into a battleground for the Cold War. Some saw the space venture as producing benefits, while others saw it as a waste of money. The quote of Britain's astronomer Royal Sir Richard Woolley is still remembered: "Space travel is utter bilge".

Certainly, no one would deny that Sputnik marked the dawn of new technology in which man would step out from the terra firma into space and continue his curiosity-driven investigations there. It was the same motive that drove Vikram Sarabhai to work for a space programme for India. On November 21, 1963, starting the programme with the launching of rockets from Thumba, he said, "There are some who question on the relevance of space activities in a developing nation.... If we are to play a meaningful role nationally, and in the comity of nations, we must be second to none in the application of advanced technologies to the real problems of man and society."

Sarabhai was answering critics who argued that a poor and developing country, such as India, had no business spending money on forays into space when there were basic problems waiting to be solved on the ground, such as water and electricity in villages, education in remote areas and availability of medicines. In hindsight, one can say that the space programme provides solutions to many problems on the ground in a way that cannot be duplicated by confining oneself to the surface of the earth.

In a far-sighted article written in 1945, Arthur C Clarke envisaged the placing of a satellite in an orbit at a critical height of around 36,000 km above the earth's surface. If placed above the equator, it would stay overhead and can be used for communications. The idea was beautifully simple, but it required technology of launching powerful rockets (much more energetic than the one launched from Thumba in 1963).

The satellite launch vehicles (SLVs) are the means of carrying a payload, such as a satellite, to the specified height. The SLVs made in India progressively got more powerful, starting with the ability to carry small payloads to a few hundred kilometres and eventually reaching the GSLV stage of placing a geostationary satellite at the height Clarke had calculated.

This achievement was not a smooth sailing affair: a toddler has to fall down many times before learning to walk. Like the space agencies of other nations, the Indian Space Research Organisation (ISRO) had to learn through failures. But now it has acquired maturity and confidence to offer its satellite launching services to other nations. This year, it launched 10 satellites in one go; an achievement that speaks for itself.

Geostationary satellites are playing a vital role in communications and information technology. Transmitting telephone calls, offering geo-positioning systems, telecasting important events live on television, such as the Olympics, internet and e-mail services are possible because we have these satellites at our disposal. Indeed, the present boom in IT owes as much to the space programme as to the progress of computers.

The satellites at lower heights also have different but useful roles to play. ISRO has a programme of remote sensing satellites that view the earth from a vantage point of a few hundred kilometres. For, the global picture you see from such heights tells you more than what you can learn from local studies. Forest covers, fields for crops, water resources and also detailed mapping of the earth's surface have enriched our knowledge of our own planet considerably. Likewise, disaster management has acquired a new dimension. Pictures of floods, approaching tsunami, cyclones and earthquakes have helped in devising strategies to deal with natural disasters.

But perhaps the most effective use of space technology has been in the fields of education and health. Children from remote and inaccessible areas can now receive education through satellite-based television programmes. Thanks to computer technology, the teacher-student relationship can be more and more interactive. Indeed, one can now say that the science fiction concept of children receiving education in their home (rather than in the school classroom) is close to becoming a reality. In the health sphere, too, remote areas can get medical guidance and help through satellite-based communication.

The Astronomer Royal was pessimistic about any benefits of space programme coming to astronomy. He could not have been more off the mark. Several satellite-based telescopes the world over are helping astronomers augment their view of the cosmos. While astrologers play upon the imaginary fears of planetary influence on humans, astronomers have been getting close up views of the planets and satellites of the solar system, thanks to the cameras carried by the space ships launched from the earth. ISRO is having its own Astrosat to observe the universe in x-rays and the ultraviolet and the ambitious Chandrayaan mission to the moon. Indeed, space technology has come to stay, and wise nations will have to learn how to harness it to their benefit.

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