

The Great Indian Arc – the Longest Measurement of Earth

The Dramatic Tale of how India was Mapped

Among the few good things gifted by the East India Company, two are of special interest to us – the establishment of the Geological Survey of India and the initiation of the largest measurement, 2500 km of the earth surface – the Great Indian Arc. This, started in 1800 was well ahead of its time, took nearly fifty years to complete, and has been hailed as ‘one of the most stupendous works in the history of science.’ Two Englishmen were connected with this survey, William Lambton who started it and George Everest who completed it. The measurement, claimed to be inch-perfect, was the fore-runner of the mapping of the whole of India and the preparation of excellent topographic maps without whose help no development by way of laying of roads, construction of bridges and other lines of communication was possible. This survey also resulted in the identification and naming of the high peaks of the Himalaya, the highest of which is named after George Everest, who as the Surveyor General of India, had measured the Great Indian Arc, and contributed to our knowledge of the exact shape of planet earth.

William Lambton (1756-1823)

A new book has recently been added to the library of the Society entitled ‘The Great Arc’ by John Keay (2000), unfolding the dramatic tale of how India was mapped. A perusal of the pages of the book tells us of the perils faced by the nineteenth century map-makers, hauling their instruments up peaks of unknown altitude... pelted by hail storms, their tents ablaze from lightning and their trail obliterated by blizzards.... They might be marooned for weeks. Then, without warning, in the chill of the first light of the day when the cloud had unaccountably overslept in the valleys, their patience would at last be rewarded. Sailing a sea of cumulus beneath an azure sky, a line of glistening summits would loom remotely from the ether (Keay, 2000). William Lambton was the first officer to be recruited for the Survey of India and ‘The Great Indian Arc of the Meridian’ was his brain child. It was like a trunk of a tree, a procession of huge, skeletal, interlinked triangles, with kilometres-long sides running from Kanyakumari in the south to Mussoorie in the north and centred some 100 km west of the 78° meridian of longitude E of Greenwich. The survey was inch-perfect but ‘as near perfect

a thing of its kind as has ever been undertaken’. ‘The accuracy was all important because the arc had as much to do with physics as with surveying. It was not simply an attempt to measure a subcontinent but also, incredibly, to measure and compute the precise curvature of the globe’ (Keay, 2000, p.xix).

The instrument ‘The Great Theodolite’, which Lambton used, weighed nearly half a tonne and was about the size of a small tractor. This delicate instrument had to be carried by porters who were trained to treat their load with care and two relays, each of twelve men, were dedicated solely to this job.

The completion of the survey has been hailed as ‘the greatest monument of practical science that has ever been or ever can be exhibited in any age or nation.’

The great survey was conceived and partly achieved by Lambton and finally completed by George Everest who succeeded to the high post of the Surveyor General after Lambton in 1829 and continued in that capacity till 1843, when he retired from service after successfully completing the work on the Great Indian Arc. Here is a good description of the reclusive Lambton given by Everest:

‘I shall never forget the impression which the bearing of this veteran and far-famed geodesist made on my mind when I first saw him.... for though we had been in camp together for some days previous, he had displayed no symptom of more than common powers, but seemed a tranquil and extremely good-humoured person..... but when he aroused himself for the purpose of adjusting the great theodolite, he seemed like Ulysses shaking off his rags; his native energy appeared to rise superior to all infirmities, his limbs moved with the vigour of full manhood, and his high and ample forehead gave animation and dignity to a countenance beaming with intellect and beauty.’

To recognise greatness in colleagues, one should possess in more than sufficient measure, similar qualities himself. Great surveyor as he was, Everest could easily recognise the outstanding merit and endearing qualities of

his colleague and superior. In praising Lambton, Everest enhanced his own reputation.

Naming of the Highest Mountain Peak

The height of the mountain peaks had to be determined by human computation in the Survey headquarters at Kolkata. The fact that it was the highest mountain in the Himalaya and probably in the whole world was first announced by the then Surveyor General, Andrew Waugh in 1856. In making this announcement Waugh declared:

'In testimony of my respect for a revered chief and in conformity with what I believe to be the wish of all the members of the scientific department over which I have the honour to preside and to perpetuate the memory of that illustrious master of accurate geographical research, I have determined to name this noble peak of the noble Himalaya as Mont Everest.'

Waugh later changed the name from Mont Everest to Mount Everest. The actual calculation and determination of the peak as the highest in the Himalaya appears to have been made by Radhanath Sikdhar, the Bengali genius whose arithmetical wizardry had impressed Everest so much. No one really bothered to ascertain the name by which the peak was known to the Tibetan or the Nepalese people. The name Mount Everest was later endorsed by both the British Government and the Royal Geographical Society.

The final value of the coordinates of geographical position for this mountain as given by Waugh was:

Mount Everest or Himalaya Peak XV

Latitude N	Longitude East of Greenwich	Height above sea level
27°59'16.7"	86°58'5.9"	29,002 feet

Few people now remember Lambton who planned the great Trigonometric Survey and struggled hard amidst great hardship to complete it. His last words, written shortly before

his death at Nagpur, reveal the greatness of this scientist who exemplified in his life the true spirit of scientific adventure:

'It is now upwards of twenty years since I commenced (the Survey) on this great scale. These years have been devoted with unremitted zeal in the cause of science and if the learned world should be satisfied that I have been successful in promoting its interests, THAT will constitute my greatest reward. In this long period of time, I have scarcely experienced a heavy hour..... A man so engaged, his time passes on insensibly; and if his efforts are successful, his reward is great.... If such should be my lot, I shall close my career with heartfelt satisfaction, and look back with unceasing delight on the years I have passed in India.'

There is no memorial erected for Lambton who lies buried in an obscure graveyard at Hinganghat near Nagpur. George Everest, his successor, is however, remembered by the name given to the highest peak on Earth.

The scientific measurements initiated by Lambton and completed by George Everest form the base on which the mighty super structure of the Survey of India has been built. The spirit, which animated the early pioneers who endured innumerable hardships in providing accurate topographic maps on a variety of scales, is sadly missing today.

What is more regrettable is that topographic maps so badly needed for planning development are denied to user agencies, raising the bogey of Defence of India. The only way in which the nation can honour the great men and their camp followers who braved untold dangers and hardships is by removing all restrictions in the supply of maps, enabling the youth of the country to know the face of their land and be proud of their heritage. India should remember Lambton and Everest for their immense contribution to the mapping of India.

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