

# The Great Bengal Cyclone of 1737 – an enquiry into the legend

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In tropical cyclone literature (e.g., Tannehill 1945; Nalivkin 1969; *Encyclopaedia Britannica* 1974; Southern 1979) a cyclone which hit south Bengal at the mouth of the Ganges in 1737 has acquired pride of place as not only the earliest known killer cyclone but also one of the worst natural disasters in human history. In fact there are only three known cyclones in which loss of life was comparable: Buckerganj 1876, Haiphong 1881 and Bangladesh 1970, in all of which the estimated loss of life was about 300 000.

## Tannehill

Under the heading 'The Hooghly disaster of 1737' Tannehill (1945) writes: 'Perhaps the greatest catastrophe of this nature was that which occurred on Oct. 7, 1737, at the mouth of the Hooghly river, on the Bay of Bengal. A furious cyclone destroyed twenty thousand crafts of all descriptions and the storm wave rose 40 ft. It is recorded that three hundred thousand people perished in lower Bengal or in the Bay.'

The most striking part of this description is the figure for human casualty. Three hundred thousand is a colossal figure for death anywhere any time in spite of the fact that recent repeated cyclone disasters in Bangladesh have brought the number within the realms of possibility. But when we consider that the storm affected an area a large part of which is underpopulated to this day the figure calls for closer scrutiny. Deaths due to tropical cyclones are concentrated to the right of the cyclone's track (Appendix A). For a storm making landfall near the mouth of the Hooghly the area to the right of the track would be the Sundarban extending a few hundred kilometres across and about a hundred kilometres deep (Appendix B). Even today, barring a narrow strip along the

course of the Hooghly, the entire area is saline swamp mostly devoid of human settlements.

Added to this is the point in time when this storm occurred. It was more than 250 years ago when the human population world-wide was only a tenth of its present number and so we realize how very unlikely the casualty figure must be for that place and time.

## Blanford

Certainly Tannehill cannot be faulted for not being able to put the storm of a distant place and time in its proper perspective (Appendix B). But it is indeed surprising that he chose to ignore the cautionary note of his evident source (Blanford 1876), a meteorologist working in India and therefore more knowledgeable about local realities. Blanford all along had a hunch that the casualty figure was inflated. He was quite explicit about this in his *Catalogue* (Blanford 1877) and also in *Vade Mecum* (Blanford 1876) which latter book Tannehill lists in the bibliography. In *Vade Mecum* Blanford says '... but judging from the character of Indian Statistical estimates, even at the present day, we may perhaps justifiably entertain a suspicion that these figures as somewhat excessive.'

## Piddington

Blanford quotes Piddington's *Hornbook* (Piddington 1848) as his source of information about this storm. But Piddington himself has not made any remark about the casualty figure in his writing.

However, the casualty figure was not the only noteworthy aspect of the report of this storm. It was also the first storm in recorded history reported to have been accompanied by an earthquake. For some unknown reason Piddington considered this storm worthy of mention in his *Hornbook* (Piddington 1848) only because of the simultaneously occurring earthquake. Is it possible that he found

the casualty figure so obviously improbable that the rest of the description also became suspect to him and he did not deem it worthy of comment? Piddington had studied tropical cyclones worldwide with a missionary zeal. His complete lack of interest in this casualty figure brooks no other interpretation, but we can only speculate.

The absence of any comment about the casualty figure in Tannehill's book, however, cannot be explained away in the same manner. That he takes the casualty figure in earnest is brought out by the sobriquet he uses for this event: 'The Hooghly Disaster'. Moreover, Tannehill makes it clear in his narrative that he has quoted Blanford and not Piddington by the date he uses. In Piddington the date of occurrence is 11 October 1737. Blanford changed this to 7 October (offering no explanation as to why he did it).

Continuing with Blanford we find that this is not the only change he effected on material he collected from Piddington. The storm crossed the coast in a riverine area and took its destructive effects quite some distance up the main channel of the river. In the material cited by Piddington this distance is 60 leagues. Blanford (1877) amends, again without any explanation, this distance to 60 miles ('league' is a unit of distance equal to about 3 miles). We shall see later that whatever his reasons for effecting these two changes Blanford was wrong in both. But then Blanford's indiscretion pales into insignificance when it is discovered that the version he amended was one which had already undergone an amazing amendment.

## Martin

Piddington obtained the details about the storm from a medical guide to Calcutta of the early nineteenth century. He writes:

'The earliest notice I can find of a storm and earthquake occurring together is the following in the *Gentleman's Magazine* for 1738-39, which I copy from Dr

Martin's *Medical Topography of Calcutta* . . . It is stated that –

On the night between 11th and 12th October, 1737, there happened a furious hurricane at the mouth of the Ganges which went sixty leagues up the river. There was at the same time a violent earthquake, which threw down a great many houses along the river side in Golgota [i.e. Calcutta] alone, a port belonging to the English. Two hundred houses were thrown down, and the high and magnificent steeple of the English Church sunk [sic] into the ground without breaking. It is computed that 20,000 ships, barques, sloops, boats, canoes, etc. have been cast away; of nine English ships then in the Ganges eight were lost and most of the crew drowned. Barques of sixty tons were blown two leagues up into the land over the tops of high trees; of four Dutch ships in the river, three were lost, with their men and Cargoes. 300,000 souls are said to have perished. The water rose forty feet higher than usual in the Ganges.

A cross-check reveals that Piddington's is a faithful reproduction from Martin's book (Martin 1837).

### The *Gentleman's Magazine*

Unfortunately, the same cannot be said of Martin (1837). Nowhere in his book had he admitted the fact that he had not collected the material directly from the *Gentleman's Magazine*. He had led everybody to believe that his was an authentic transcript of the piece in the magazine and has, thus, been the principal instrument in perpetuating the myth in tropical cyclone literature. In reality he had copied the details from another book depending, evidently, on its reliability.

When we refer to the *Gentleman's Magazine* (1738) (Appendix C), we find that not only is the piece in the magazine worded in a completely different manner but also many details are missing while others have been added.

The narrative in the magazine starts with a completely different date. It mentions 30 September as the date of occurrence, without further qualification as to the time of day. Since in Martin's (1837) description the date appears as 'the night between 11th and 12th of October' one is immediately beset with doubt as to whether there was another storm closely followed by the later one. However, correspondence of many details soon reassures us that the same storm is being described. As it turns out

this is certainly the most harmless of all the amendments and had some justification though it would have been considerate of the author of this modification if he had taken trouble to explain a little. It was difficult after about two and a half centuries to recollect that the Gregorian calendar was not in use in the British Empire in 1737 and the date 30 September is according to the earlier Julian calendar then in use. It matches very well with the date 11 October (but not 7 October as mentioned by Blanford) which would be its Gregorian equivalent.

But the really surprising discovery in the account published in the *Gentleman's Magazine* (1738) was the complete absence of any estimate of lives lost in the storm. The entire sentence containing the statement on human casualty in Martin's (1837) transcript is evidently an implant, an amendment like that made by Blanford but much more radical not only in its scope but also in its impact. Because it is solely on the strength of this casualty figure that this storm is ranked among the worst, if not the worst, tropical cyclone disasters in recorded history.

### Contemporary accounts, 1737

We will leave aside the question as to how such a gross distortion of a major event could occur within a century of its occurrence. We will instead pursue an enquiry, more relevant for the history of tropical cyclones, as to where this discovery leads us. Is there any contemporary account which gives a dependable estimate of damages to confirm that reported by the *Gentleman's Magazine*?

It so happens that the storm also affected Calcutta where the English had started a trading post less than 50 years earlier. For the early settlers the storm must have been something to write home about.

One such letter from a well connected settler was preserved in his family papers and came to light more than 160 years after the event (Wilson 1898). The letter is dated Calcutta, 31 December 1737, and speaks of a 'dreadful hurricane we had here the 30th September at night'. It goes on to give some graphic details:

'Such a scene of horror as that night was, I never saw or heard off. Such terrible gust of wind like the lowest thunder and

torrents of rain that I expected every moment the house I lived in, which is, I believe the strongest in the town, would have fallen on my head. The noise was so violent above stairs that myself and family was obliged to go down and stay below till morning with poor Mrs. Wastell and her children who had fled to our house for shelter the doors and windows of hers being burst from the walls. But good God what sight was the town and river in the morning; not a ship but the Duke of Dorset to be seen in the river where the evening before was twentynine sails of vessels great and small many being drove ashore. Some broke to pieces and others foundered and this which is scarce creditable in a river hardly a mile wide, there was no ebb tide for near twenty four hours. Our church steeple was blown down as also eight or ten English houses and numbers belonging to the black Merchants. The whole town looked like a place that has been bombarded by an enemy. Such a havoc did it make that 'tis impossible to find words to express it. All our beautiful shady roads laid bare which will not be the like again this twenty years.'

### Bengal public consultations, 1737 and 1739

The East India Company (the English trading company) establishments at Calcutta also felt the impact of the storm. Official details of the effects as recorded in its papers also confirm broadly the descriptions in the *Gentleman's Magazine*. In an entry in *Bengal Public Consultations* dated 15 October 1737, which I quote from another source (Wilson 1906), it is stated that:

'The late Violent Storm having laid the whole Black Towns, quite throughout the Honourable Companys bounds, insomuch that hardly twenty Thatched Houses were standing the next day, and the Inhabitants losing the little they had are rendered incapable of paying the Rents . . . what still adds to the Calamity is that by the Violent force of the Wind the River overflowed so much that a great Quantity of Rice was quite Spoil'd . . . and near 3,000 Inhabitants were killed as great a Number of large Cattle besides Goats and Poultry destroyed.'

Here we get an estimate of human casualty which is but a hundredth of the legendary number. Lest this relatively modest number appears to undermine the storm's standing as one of the major cyclones in human history let us remember that this figure is only for the



Severe thunder storm north-east of Sedona, Arizona, 20 August 1992 (CT © Jeronimo Lorente)

English settlement more than 120 km inland at Calcutta and the contiguous areas under the company's influence. The large, albeit thinly populated, area south and east of Calcutta across which the storm has swept up from the Bay of Bengal is out of this reckoning. More importantly it was of a period when Calcutta had only about a hundredth of its present-day population.

There is also reference to damages suffered by company installations later in the entry dated 15 October. A detailed listing thereof is also given in the entry dated 17 October. That the storm left a deep imprint is borne out by the fact that it crops up again in a correspondence more than a year later. A letter (Wilson 1906) dated 29 January 1739 speaks of

'... the storm which levelled most of the Walls in the Town, shattered and threw down many of the Buildings and blew up the Bridges, the Tide some days after broke in upon and carried away some of the Wharfs Ships and Stairs, the Places most Damnified are the Peers on the factory Wharf, Wharf and Ships at Soota Loota Walls round the burying place and powder magazine and the factory Points, Church steeple was over thrown'

There is evidence of a much deeper imprint, the true signature of a really major storm. Further on in the same letter we find the following entry: 'A Sad Effect of the Hurricane was a Famine that raged all round the Country best part of the Year, were obliged to forbid the Exportation of Rice the 5th June ...'.

As is well known, the most persistent (and the most pernicious) of all the possible effects of a severe tropical cyclone is the loss of soil fertility due to saline incursion.

How many lives were lost due to starvation? We did not come across any record.

### Conclusion

Though the casualty figure routinely quoted with this storm is an unauthorized implant and the actual casualty must have been much less, all available accounts of the damages as far inland as Calcutta suggest that the storm was indeed a major one.

### Appendix A – Destructive effects of tropical cyclones

Strong winds and torrential rain are a cyclone's more well known but relatively less destructive aspects. In a 'killer' cyclone the death and destruction is mainly due to the sea effect. It is a sudden spectacular super-elevation of the sea surface known as 'storm surge' which develops to the right of the storm as it travels over coastal waters. As the storm crosses a coast this surge moves inland with a sheer wall-like front almost simultaneously with the storm centre. In this part of the world the total sea elevation in a cyclonic storm has often reached 12 m.

The destructive aspects of the storm are, moreover, not of uniform strength in all directions around the storm centre. The storm surge, in particular, is almost entirely

concentrated to the right of the point of landfall extending up to a distance of about 150 km, its height peaking at a distance of about 25 km from the storm centre and falling off gradually further away. The death and destruction from a cyclonic storm is therefore mainly to the right of the track.

Inland penetration of surge depends on the coastal topography but comparatively is much less, not much more than 10 km when the coastline is unbroken by river mouths or estuaries. Where an estuary or river mouth is present in the surge-affected coast, the surge can travel along the water course for a long distance and cause comparable damage inland. During the Bangladesh cyclone of 1970 the surge exceeding 2 m extended about 130 km normal to the storm track but had reached almost 160 km inland along the track in that highly deltaic region.

### Appendix B – South Bengal in 1737, a perspective

#### *Geographical*

The Indian Ocean, to its north-east, forms a relatively shallow embayment roughly between latitude 5°N to 22°N and longitude 80°E to 95°E, known as the Bay of Bengal. It is bordered to the north by a wide continental shelf where a number of large rivers of the Indian subcontinent drain from the north. Two such rivers, the Ganges and the Brahmaputra, form a wide flat wedge of delta country covering almost the entire head of the bay. The seaward fringe of this delta is known as 'Sunderban'. It is a network of estuaries, rivers and creeks which enclose a large number of flat, marshy islands. Many are covered with dense forest and a denser

undergrowth standing in soft mud, half in and half out of the water. The area under forest is about 7766 km<sup>2</sup>. Cultivation is confined to the north where over 5177 km<sup>2</sup> have been settled, but the population is very sparse. South of the area of cultivation, the Sunderban is practically uninhabited.

The westernmost distributary of the Ganges, and also the westernmost boundary of the Ganges-Brahmaputra delta is an almost north-south channel known as the Hooghly. On its east bank, 128 km upstream from the head of the bay, stands the port city of Calcutta, the only urban agglomeration in the area in those days. About its population the available records speak of a figure of 12 000 in the year 1700, 22 000 in 1706, 82 000 in 1710 and 100 000 by 1735.

Downstream the Hooghly – itself joined by two tributaries flowing in from the west, the Damodar and the Rupnarayan – acquires a fairly wide expanse before it meets the bay.

### Climatological

The Bay of Bengal is one of the major tropical cyclone basins where an annual average of five tropical cyclones form – 6 per cent of the global total. Here there are two cyclone seasons, one before and the other after the Asian summer monsoon months, June–September. Germinating usually in the south-east of the bay as feeble low pressure areas, these storms gradually gain in intensity as they move towards the coast. Initially almost all of them travel north-westwards. In the post-monsoon months of October and November the majority of these later move north and finally some change to a north-eastern movement and hit the coastal areas to the north of the bay. These ‘recurving’ storms (as they are called) have a much longer sea travel than those that continue to move north-westwards and cross the coast west of the bay. As a result they have time to attain much more intensity. All the major cyclone disasters of this basin have resulted from such recurved storms.

The very wide continental shelf along the northern coastline of the bay amplifies the sea effects even from a storm of moderate intensity to immense proportions. Often these sea effects are transmitted well inland through innumerable estuaries and channels of rivers that drain into the bay. The more recent Bangladesh disasters of 1970 and 1991 are illustrations of the calamitous potentialities of the combination

### Appendix C – Transcript of the report in *Gentleman's Magazine*

‘Historical Chronicle, 1738

June

On September 30, last happened a furious Hurricane in the Bay of Bengal, attended with a very heavy Rain, which raised 15 Inches of water in 5 Hours, and a violent Earthquake, which threw down abundance of Houses, and as the Storm reached 60 Leagues up to the River Ganges, it is computed that 20,000 Ships, Barks, Sloops, Boats, Canoes &c have been cast away. A prodigious Quantity of Cattle of all Sorts, a great many Tygers and several Rhinoceroses were drowned, even a great many Caymans were stifled by the furious Agitation of the Waters, and an innumerable Quantity of Birds was beat down into the River by the Storm. Two English ships of 500 Tons were thrown into a Village above 200 Fathom from the Bed of the River Ganges, broke to Pieces, and all the people drowned pellmell among the Inhabitants and Cattle. Barks of 60 Tons were blown two Leagues up into the Land over the Tops of high Trees. The Water rose in all 40 Foot higher than usual. The English ships drove ashore and broke to Pieces, were the Decker, Devonshire, and Newcastle; and the Pelham is missing – A French Ship was drove on Shore, and bulged, after the Wind and Water abated they opened their Hatches, and took out several Bales of Merchandise, &c, but the Man who was in the hold to sling the Bales suddenly ceased working, nor by calling to him could they get any Reply, on which they sent down another, but heard nothing of him, which very much added to their Fear, so that for some Time no one would venture down. At length one more hardy than the rest, went down, and became silent and unactive as the two former to the Astonishment of all. They then agreed by Lights to look down into the Hold, which had a great Quantity of Water in it, and to their great Surprize, they saw a huge Alligator staring as expecting more Prey: It had come in thro’ a hole in the Ship’s Side and ‘twas with Difficulty they killed it, when they found the three Men in the Creatures’ Belly.’

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ACKNOWLEDGEMENTS I am grateful to the Indian National Science Academy for funding a project of mine which germinated this enquiry and to Dr P. K. Das, the eminent atmospheric scientist, for support. I am also indebted to the following persons for their unstinted help: Dilip Gupta, Assistant Meteorologist (retired), in data collection at the early stages; Ranjan Gupta, the noted economic historian, in offering valuable comments on the first draft; Mrs N. Jayanthi, Director, Meteorological Office, Madras, in data collection at an intermediate stage; M. R. Sengupta, Archivist (retired), for guidance in locating archived material; P. Tankappan Nair, the noted authority on old Calcutta, in guiding towards relevant published material.

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