

## EARTHQUAKE PHENOMENA IN TASMANIA.

By CAPT. SHORTT, R.N. (Meteorological Observer.)

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Since last November when I read a former paper on earthquake shocks and tremors, and up to the present time there has been a considerable decrease both in the number and intensity of the shocks, excepting that of May 13th.

From the table annexed with this paper, giving the time of occurrence, it will be observed, that at Gabo the shock is felt earlier than in Tasmania, also shocks have been felt farther inland on the continent of Australia, showing that the centre of disturbance during the past year, is to the north of the centre, marked in the Coloured Map, produced in my previous paper. The disturbance has been felt very severely at the Kent Group Lighthouse about a dozen panes of glass have been broken from the commencement.

To strengthen the position I have taken in fixing the probable centre of disturbance. I will introduce the views of Professor Milne, of Japan, who recently visited Victoria and Tasmania, and published an article in the Melbourne *Argus* on the earth movements in Australia. He is undoubtedly a great authority on Seismology, on account of Japan being always more or less in a state of disquietude from shocks and tremors, and his having had charge of the Seismological Department for some ten years, making a study of the Volcanic Phenomena, and his investigations have not been confined to actual disturbances, but also by experiments with dynamite discharges in the earth at various depths, by which he has gained much knowledge as to the rate of progression of shocks through different strata.

The following are his conclusions on the disturbance affecting us:—"From the various investigations which have been made, it appears that there is a line of weakness in the earth's crust running parallel to the eastern coast of Tasmania. From time to time, whilst sinking to a state of equilibrium, this line gives way, first at one point and then at another. Each of these movements is announced as a series of tremors which now and then may be accompanied by one or more violent lurches. If this is a correct view to take, then, in a few years, it is possible that actual stability may be reached, and the earthquakes of Tasmania and Victoria become tradition of the past.

"A second view is that the disturbances are directly connected with the capillary intrusion of sea-water to volcanic foci, consequent on which there are explosions and ruptures

along the above-mentioned line of weakness. Be it as it may, it is certainly remarkable that the greater number of earthquakes in the world occur in volcanic countries, but not actually at volcanoes. They usually originate on or near the foot of a slope beneath deep water. Eighty per cent. of the earthquakes in Japan have such an origin. The great earthquakes of South America, which are sometimes propagated to the shores of this colony as a series of sea waves, originate beneath the deep water off the western coast of that continent. Many of the earthquakes of New Zealand have originated beneath the ocean at the entrance to Cook's Straits.

"Lastly, we have the earthquakes which have so recently been felt in Melbourne, probably originating, as pointed out by Captain Shortt, near to the edge of the 2,000 fathom line off the north east shore of Tasmania."

#### REPORTS ON THE EARTHQUAKE SHOCKS, 1885.

January 1.—Barque Free Trader at sea, when 80 miles to the Eastward of Flinders Island, experienced a severe shock at 2 p.m., duration about 10 seconds.

January 31.—The Superintendent of Swan Island Light House reports that a shock was felt at 12h. 36m. a.m. The Light House appeared to rock, and everything seemed to be on the move for several seconds.

February 27.—9h. 35m. p.m. at Swan Island, severe shock, was reported as remarkable, as during several seconds, the iron roof on Superintendent's dwelling house sounded as if it was tearing in all directions, but no damage was sustained.

March 21. and 30.—Medium strong.

May 13.—This shock was the heaviest experienced since September 19, 1884, and the great distance the shock was felt from the centre of disturbance shows it to be as strong as the very severe one of July 13th last year. Extending to Corrina to the Westward, Melbourne N. W.; and to the North to Candello, which is 258 miles South of Sydney. It was felt severely at Hobart and Launceston. Vessels lying alongside the wharves at Hobart were surging backwards and forwards, as if there was a ground swell moving the ships.

Also at Sandridge the effect on the shipping was most noticeable.

Mr. J. R. Hurst, of Moorina, in describing the shock, states that he saw cats and dogs flying about the yard, in great alarm, and a mob of cattle grazing in a paddock in the same state; dead standing trees in the clearing were moving about in nearly a North and South direction, and small branches falling from them, wave-like motions were observed upon the earth under foot,

July 17.—Strong shock, loud and long rumblings at Moorina.

August 7.—At 8 p.m. barque Kassa experienced sharp shock of earthquake when 30 miles East of Cape Barren Island.

September 11.—The strongest since the 13th of May.

Before concluding I beg to thank Mr. R. M. Johnston, and Mr. J. Clunies Ross, for the assistance I have received from them in acquiring knowledge of earthquake phenomena, as it comes more under the province of Geologists, than Meteorologists. The Secretary of the Meteorological Society, London, in acknowledging receiving my previous paper on shocks and tremors, remarked that the Phenomena has not been recognised to have any connection with the Weather and Meteorology.

I also wish to make acknowledgments, and return my thanks to those observers who have rendered me assistance in furnishing records of shocks that have come under their notice.

TABLE OF THE SEVEREST SHOCKS, NOVEMBER, 1884 TO  
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TIME OF SHOCKS ON THE CONTINENT CORRECTED TO HOBART  
TIME. A. = A.M., P. = P.M.

Month.	Date.	Hobart.	Launceston.	Moortna.	Falmouth.	Corinna.	Gabo Isl'd.	Wilson's Promontory	218 miles S of Sydney, Candello.
1884. Dec.	20	—	—	7·8 P	—	—	7·5 P	—	—
1885. January	31	12·55 A	12·53 A	12·57 A	—	—	12·50 A	—	—
February	27	9·50 P	9·49 P	—	—	—	9·45 P	—	—
March	21	9·13 A	9·11 A	9·7 A	9·20 A	—	9·10 A	9·20 A	—
March	30	—	—	9·13 P	9·15 P	—	9·10 P	—	—
May	13	9·38 A	9·37 A	9·39 A	9·40 A	9·45 A	9·35 A	9·37 A	9·45 A
July	17	8·38 A	8·35 A	8·32 A	8·35 A	—	—	—	—
Sept.	11	7·19 P	7·20 P	7·17 P	7·25 P	—	—	—	—