

NOTES ON THE POSSIBLE OSCILLATION OF
LEVELS OF LAND AND SEA IN TASMANIA
DURING RECENT YEARS.

BY CAPTAIN SHORTT, R.N.

During the years 1883, 1884, 1885, and 1886, or immediately prior to the eruption at Tarawera, this island, and the South-Eastern portion of the mainland of Australia, were frequently shaken by earth tremors; and as such disturbances are often known to be associated with local changes of sea and land, it appeared to me to be of great importance to ascertain whether any recent change could be traced along the coast-line of this island.

This enquiry in a young colony is attended with many difficulties, as with one isolated exception, hereafter discussed, no definitely fixed tide marks are in existence by which satisfactory conclusion might be drawn.

The exception, however, is of peculiar interest, as it affords us some information, so far as the locality is concerned, in which this fixed tide mark occurs. The tide mark here referred to is situated on the North side of the "Isle of the Dead," which lies off Point Puer, Port Arthur. This mark was cut in the rock broad arrow form, on the 1st July, 1841, by the then Deputy-Assistant Commissary-General, Mr. Lempriere. The circumstances under which this mark was placed there is explained by Captain Sir James Clark Ross, R.N., in his work entitled "A Voyage of Discovery and Research in the Southern and Antarctic Regions during the years 1839-43." Thus Page 22:—My principal object in visiting Port Arthur was to afford a comparison of our standard barometer with that which had been supplied to Mr. Lempriere, the Dupty-Assistant Commissary-General, in accordance with my instructions; and also to establish a permanent mark at the zero point, or general mean level of the sea, as determined by the tidal observations which Mr. Lempriere had conducted with perseverance and exactness for some time; by which means any secular variation in the relative level of the land and sea, which is known to occur on some coasts, might at any future period be detected, and its amount determined. The point chosen for this purpose was the perpendicular cliff of the small islet off Point Puer, which being near to the tide register, rendered the operation more simple and exact; the Governor, Sir John Franklin, whom I had accompanied on an official visit to the settlement, gave directions to afford Mr. Lempriere every assistance of labourers

he required, to have the mark cut deeply in the rock, in the exact spot which his tidal observations indicated as the mean level of the ocean.

I may here observe, that it is not essential that the mark be made exactly at the mean level of the ocean, indeed it is more desirable that it should be rather above the reach of the highest tide, and the exact distance above the mean level recorded.

The most desirable position for such another mark would be near the North-West extremity of the island, in the vicinity of Cape Grim.

Mr. Lempriere, it is evident, carefully carried out these directions, for on a tablet still existing a little above the tide mark in question is the following record. "On the rock fronting this stone a line denoting the height of the tide *now struck* on the 1st July, 1841, mean time 4 h. 44 m. p.m.; moon's age 12 days; height of water in tide gauge 6 ft. 1 in."

It is stated by my informant, Mr. T. Mason, that the words and figures underlined are nearly obliterated, and that he has given what they appear to be. It is unfortunate, also, that no other records can be found relating to Mr. Lempriere's tidal observations, although I have searched all local records. I have also applied to Capt. W. J. Z. Wharton, R.N., Hydrographer of the Admiralty, with the view of ascertaining if they had any records relating to Mr. Lempriere's observations at Port Arthur, but in answer I learn that no records of tidal observations have ever been received at the Admiralty.

Capt. Wharton at the same time informs me that the approximate time of high water on 1st July, 1841, was 5 h. 35 m., p.m., that is nearly an hour later than the apparent record on the tablet. If we now assume that the tide *now struck* refers to high water, which is most probable, we have some means of determining whether any change has since occurred in the relative levels of sea and land.

Mr. Mason, at my request, very kindly ascertained the time of low water on February 24th, 1888, at 11 h. 45 m. a.m., which day corresponds relatively with the moon's age 47 years previously.

At this low water level the mark was found to be $2\frac{1}{2}$ ft. above. This very closely corresponds with the normal difference between these levels of low and high water, and would therefore indicate that there has been practically no alteration of the relative levels of sea and land during the last 47 years. This, however, only bears witness to possible movements in the Southern portion of the island. As regards the Northern portion there is no definite knowledge; but it is interesting to place on record, that Captain Miles has learnt from the half-casts in the Furneaux Group they have noticed within the last few years

that there seems to be less depth of water over certain well-known rocks near the islands than formerly. This, however, if true, does not seem to have been a sudden change, but rather a slow elevating movement possibly still going on. As it is of the greatest importance to get more definite information with regard to this locality, I have already taken some steps to fix a tide mark on Flinders Island, so that in future years observations may be made upon some certain data that we at present possess.

It would be desirable also in the interest of Navigation to have such marks carefully made on various parts of our coast line.

It might be of value, therefore, if this important matter received the attention of the Members of this Society.