

LETTERS TO THE EDITOR.

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The Deformation of Rocks under Tidal Load.

THAT a shore-line should be depressed by the weight of a high tide and rise again when the tide retreats is an idea that has occurred to many. Sir George Darwin has on certain assumptions calculated the form and amount of deformation to be expected under given tidal conditions. In the British Association Report for 1910, p. 49, I showed

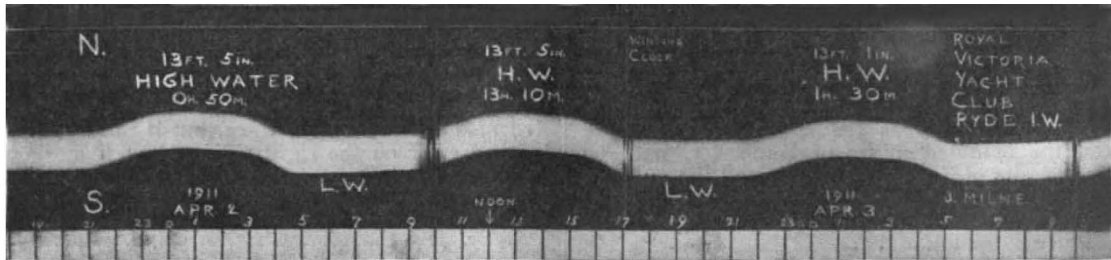


FIG. 1.—Record of Deformation of Ground by Tidal Load.

what had actually been recorded by Mr. W. E. Plummer at the Bidston Observatory, which lies two miles inland from high-water mark. At that place a 10-foot tide resulted in an angular deflection of approximately 0.2". Had the instrument been nearer to the sea a greater change in inclination might have been expected.

This year, between March 4 and May 24, an instrument similar to that at Bidston was, by the kind permission of the committee of the Royal Victoria Yacht Club, installed in the base of their premises at Ryde. The distance between this installation and high-water mark was 138 feet. The displacements due to a 10-foot tide were approximately 0.9". This is more than I should expect to find at Bidston if that observatory were near to the high-water mark. If it would be really greater, then the soft Tertiaries beneath the Solent yield more than the hard sandstones which run seawards from Bidston. This may perhaps be a point of interest to geologists. The astronomer with his observatory near a seashore will realise the extent to which he is handicapped, due to tidal tilting, in relation to the man who makes similar observations twenty miles inland.

Considering the magnitude of the deflections due to tidal load, the geophysicists may wonder whether we could or could not in a country like Britain obtain satisfactory measurements of a terrain tide due to lunar influences. The definite measurements of the amount of bending which a tide produces on a floor of a shallow dish-like sea bed puts the hydrographer in a position to calculate the difference between what he observes in the rise and fall of the tide and what it would be if the bed had been absolutely rigid.

Lastly, as to the seismologist who has tried to find the relationship between earthquake frequency and tidal load. So far as I know, this has not yet been shown. The reason for this is perhaps because we have not confined our attention to earthquake regions where the effect of tidal load was marked.

The diagram (Fig. 1) is a half-sized reproduction of a "graph" at Ryde. The flat crests and sinuses of the waves indicate that the tide lingers for a considerable time at "high" and "low." The reason for this is apparently connected with the fact that Ryde is approached by tides from two directions. One enters the Solent from the east and the other from the west, but at somewhat different times.

Shide, Isle of Wight, July 5.

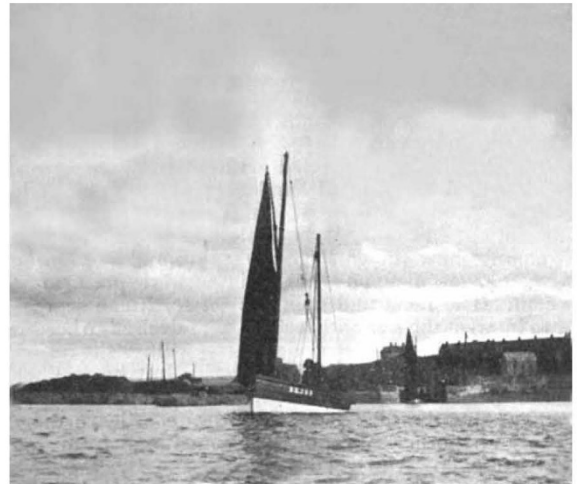
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Electrical Discharge—Possible Cause of Flare Spots in Photographs.

DURING a recent yachting cruise on the north-east coast, I sailed from Holy Island to St. Abbs, arriving off the harbour before the fishing fleet came out, and therefore dropped anchor off the entrance. About 5.30 p.m. some of the Scotch herring boats sailed out, and I photographed one shortly after leaving the entrance, and another when she was well outside. On having the two negatives developed and printed, I was disappointed to notice that both pictures were considerably marred by a white flare extending from the mast and yard of the sail skywards. At first I put down the flare spot to light leaking into the camera, or some sort of optical halation. On considering the matter more carefully, I was struck with the coincidence of both photographs showing the defect start-

ing from the yard and the mast, and not at all visible on the lower dark sail. I talked the matter over with several friends, and eventually Mr. C. Faraday Proctor jokingly suggested it was evidently caused by electrical discharge. We both took the idea in a sarcastic spirit; but very soon we realised that the suggestion was not so ridiculous, and was well worthy of serious consideration, particularly as I remembered that the weather conditions had been thundery during the two previous days whilst sailing up from Blyth



Photograph of Flare Streak, possibly due to Electric Discharge.

to Holy Island. I then carefully examined other photographs taken on the following day of boats in the harbour, and several of these showed evidence of the same effect.

I enclose herewith three photographs.

No. 1 (here reproduced) shows the keel boat just sailing out of the harbour, taken Tuesday, June 20, 5.30 p.m., looking south.

No. 2 shows boat taken a few minutes later looking east.

No. 3 shows boats in the harbour looking north, taken about 1 p.m. on Wednesday, June 21. In the sky above