

## Some Notes on the Geology of Otterhampton.

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OTTERHAMPTON and its immediate neighbourhood have the unusual advantage of a great variety of strata and of situation, crowded together into so small a space that the little corner of land between the Quantock Hills, the Parret, and the Channel, is a sort of epitome of large tracts elsewhere. The surface is much broken and diversified, and there is abundant evidence of great geological disturbance in former ages, and also of further and more gradual changes which are still in progress.

Otterhampton itself, the Church, the Rectory, and the high ground to the south, and south-east, and west of them are all on the Lias. The Lias is quarried for lime opposite the corner of the lane which turns out of the Stoke Courcy road to go to Otterhampton, and also by the road-side between Stockland and Stoke Courcy. It is found in beds of blue and ochreous yellow intermixed and strongly contrasted with each other. It runs in a north-westerly direction until it meets the sea at Stolford, and forms rocky shoals there and at Wick Rocks, and low cliffs at Shurton Bars and Lilstock. Large fragments of it are frequent on the beach, in the form of heavy oval and rounded pebbles, which often contain ammonites of large size, although these are certainly very infrequent in the cliffs and quarries. For this there are probably two reasons; first, that these rolled and rounded pebbles come from a distance, and from strata more rich in fossils; and further, that the ammonites themselves have formed the nuclei of hard accretions, which have resisted the action of the waves and currents better than the rock in general does.

The soil on the Lias is a rich, stiff, tenacious clay, almost impervious to water, and singularly destitute of springs; although

there is one by the roadside at Otterhampton, between the Rectory and the Church, whence trickles a tiny rill, which seldom fails, and which is full of water-cresses, a sure sign of the clearness and purity of the water.

The strata of the Lias clearly show that they were deposited in deep and quiet seas; and must therefore, of course, have once been horizontal. But they are now bent, twisted, distorted and inclined at all sorts of angles, and in all manner of directions. This is particularly observable on the flat reefs left bare at low water near Stolford; which have been worn away by tides and storms, until we get a horizontal section of them of the most curious kind.

I do not know the total thickness of the Lias, but it is not great. In sinking a well a few years ago between Otterhampton and Comwich, the Lias was pierced, and the well-sinkers came to the New Red Sandstone which lies beneath. In fact the Lias seems to form a mere crust, covering a narrow strip of country, and extending in a direction from south-east to north-west. It is a very useful kind of stone, furnishing not only lime, but building and paving stones, easily worked, and easily reached; for the rock comes very near the surface everywhere, and sometimes almost rises into view.

A valley of deep alluvial soil extends along the south side of the Lias, and entirely conceals and covers up the rocks which intervene between it and the New Red of Cannington and the still older rocks of Cannington Park and the Quantocks. This valley is of no great width, and joins the broad valley of the Parret just at the south-east corner of Otterhampton parish. A rich level alluvial tract of pasture extends northwards to the channel and north-east to the narrow point of Steart, where the Parret enters the sea. This tract of alluvial soil seems to date from a period when our Somersetshire hills rose, as islets, out of a shallow sea. Even now the difference of level is very slight indeed; and instances have been known when the sea has burst through the sea-wall and rapidly spread over the whole flat, close

up to the villages of Stockland and Otterhampton. The last instance that I have heard of was about fifty years ago, or rather less. An unusually high spring tide forced its way through, and the sheep and cattle, grazing in the meadows, were exposed to imminent danger. But none were lost; and as, providentially, it was a morning tide, and not an evening one, at nine a.m., instead of nine p.m., travellers could see their peril and escape it.

Even now the inroads of the sea are formidable. It is certainly encroaching, steadily and surely, and almost rapidly. Even within my own recollection of the neighbourhood, which only extends over twenty years, it has gained very considerably. Along the edge of the common, near Steart, there used to be a raised pebble beach, called the Chesil, of which very few traces remained even when I saw it last, which is now six years ago. Just at the end of the common, on the road to Steart, there used to be, when I knew the place first, not quite twenty years ago, a house—an inhabited house; a wretched place indeed, but still inhabited. There was a gate on the north of it, and a low stone wall beyond the gate. The road to Steart passed through this gate, with the house on its right hand. All this has long vanished. On the 30th and 31st of January, and 1st of February, 1869, a series of gales and high tides tore up the pavement and foundation of the house—which was already a ruin—strewed fragments of the wall along the beach, heaped up a shingle beach in what had once been the fireplace, and destroyed the road. The wide expanse of mud, from which the sea retires at every tide, and over which it returns again with such a swift approach and such a low, threatening roar, was probably at no distant date a tract of fertile land. In fact an old man told me, in 1869, that he well remembered a farm house, with its barton and buildings, far out to the north-west of Steart, once (like Virgil's Tenedos), "dives opum,"

"Nunc tantum sinus et statio male fida carinis."

Treacherous indeed to shipping that shore is, for the tides rise unusually high on this part of the coast, and the land is so low as not to be easily distinguished. I remember a vessel running ashore, in 1869 I think, very near the village of Steart, and her position clearly showed that those on board of her had supposed themselves to be in mid-channel, when they were actually standing right in upon the shore, and near the houses of the village.

These encroachments of the sea have swept away another spot, which was well known some sixty years ago. I have heard from old men that there was in those days an island of considerable size near the mouth of the river; on which stood a house of entertainment, which drove a roaring trade in the days of high protective duties. Brandy and foreign wines could be "run" with ease and safety upon this island; which, as being an island, was in some way or other exempt from the ordinary jurisdiction of the revenue officers. Now not only has the privilege itself been swept away, but also the place that enjoyed it. I am not sure whether this was the same island of which a small piece still remains, and is used (or was six or seven years ago,) as pasture for sheep. That island was once much larger, and had cornfields on it; as I have been told by an old man who had in his youth helped to reap and carry the corn.

These encroachments of the sea, so recent, so extensive and so rapid, clearly show in my mind that the whole plain is gradually sinking. We know that the level of the sea cannot alter: it is the level of the land that alters; and the earth which seems so solid is in fact far more variable than the sea, which has been taken as the very emblem of inconstancy.

There are, in my opinion, clear indications that a gradual depression in the whole coast line thereabouts is going on now, just as at some former period there had been a gradual elevation. The sections displayed by the action of the sea all along towards the point at Steart show successive layers of black alluvial soil and of shells; shells not fossilized, but well preserved in their

natural state. These must have been deposited in the bottom of a shallow sea or lake. I suppose a conchologist could tell us whether the shells bespeak a salt water or fresh water origin. I am sorry I am not able to speak on this point.

As to the period at which this upheaval and subsequent depression took place, I venture to make a suggestion which has often been forced upon my mind as I have walked along the beach at Steart, viz., that they are much more recent than one might suppose. I think it quite possible that, in the days when the Danes landed on these shores, the river entered the sea by a more direct course than it does now, leaving Steart on its right bank, instead of its left. This would make Combwich and Cannington much nearer to the sea, and much more accessible from it than they are now. If so, this would tend to confirm the conclusions arrived at by the Hon. and Right Rev. Prelate, in his most interesting, and to my mind convincing, paper on Alfred's great campaign. An upheaval of a few feet, almost of a few inches, may have diverted the stream : just as most certainly a depression of a very few feet would enable the river to make a new way for itself straight towards the sea, which the fierce rush of the tide would soon widen and deepen into a broad estuary. The Danish host would then have landed close to the first rising ground they came to, not more than two miles from the open channel. But however this may be, the change of coast line in recent times is plain matter of fact ; to which I trust the Society will excuse my drawing their attention, as it seems to me to deserve, and indeed to require careful observation.

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