

*Monday, 4th March 1867.*

SIR DAVID BREWSTER, President, in the Chair.

The following Communications were read :—

1. On the Arctic Shell Clay of Elie and Errol, viewed in connection with our other Glacial and more Recent Deposits. By the Rev. Thomas Brown, F.R.S.E.

Referring to the papers formerly read before the Society in 1863 and 1864, the author first noticed the Section at Errol, its stratigraphical position and fossils, more especially the skeleton of a seal which had been found in the clay. He then described more in detail the different deposits as they occur in the neighbourhood of Elie. Since the shore Section was described in 1863 two new Sections had been examined, and the position of the different beds more fully ascertained. One was in the railway cutting extending from Elie Bridge to the Railway Station, in which, when first laid open, the series of deposits was remarkably well displayed. Beginning a little to the east of the station, the following beds were seen in the descending order :—

1. Blown sand with intercalated beds of shell-bearing peat, one of which was six feet in thickness. This upper portion of the series is largely developed.

2. A peculiar bed of peat destitute of shells, and apparently a continuation of that at the shore,—the submerged forest.

3. A portion of the high-level stratified gravels and sands of the district.

At this point there is a break in the series. The portion above is unconformable to that beneath.

4. The arctic shell clay—a continuation of the same deposit seen on the shore about one-third of a mile distant.

5. The boulder-clay in two stages, with large boulders enclosed.

6. The basement-bed of the boulder-clay full of shivers, and resting immediately on the rock.

These different deposits are seen in regular succession from east to west.

The other Section lies to the westward of Kincaig, and runs nearly at right angles to the former, passing from the shore inland up the course of the Cockle Mill Burn. It shows the following beds:—

1. Blown sand rising into dunes close to the shore.

2. The so called raised beach consisting of sand, shingle, and shells in layers, the shells being the common species of the shore, and very much in the same state as those now on the beach. This deposit is powerfully displayed, rising at some points to twenty feet above high-water mark.

3. Further inland, and apparently underlying No. 2, is a series of sands and clays in contorted layers. Marine shells occur at various points. One of the layers of clay was pointed out containing numerous specimens of *Scrobicularia piperata* in their natural position, with the siphonal end uppermost. As this bed is from twelve to fourteen feet above high-water mark, attention was called to the evidence thus furnished for a rise in the bed of the Firth, and its remarkable coincidence with the evidence furnished by the same deposits at Stirling and Portobello.

4. The submerged forest of Largo Bay as it is found near the mouth of the stream, between tide-marks.

The additional species of shells were described as determined by Dr O. Tozell, and the still more complete evidence thus furnished of extreme arctic cold.

## 2. On the Motions and Colours upon Films of Alcohol, Volatile Oils, and other Fluids. By Sir David Brewster, K.H., F.R.S., &c.

In a paper “On the Phenomena of thin Plates exposed to Polarised Light,” published in the Philosophical Transactions for 1841, the author observed certain motions and colours upon some of the volatile and fixed oils, the cause of which he did not attempt to discover. Their apparent similarity to the molecular movements and colours, described in a preceding paper, induced him to resume the subject.

When a drop of alcohol is placed upon an aperture the fifth of an inch in diameter or less, a concave lens will be formed upon it. As the alcohol evaporates, a very small plane film will appear in the centre, and will gradually increase till it fills the aperture. If