

even when diligently searched for, I think it right to present to the Society for preservation the *five* topazes in which the cavities were found.—I am, ever most truly yours.

(Signed) D. BREWSTER.

ALLERLY, *Feb.* 7, 1863.

2. On the Polarization of Rough Surfaces, and of Substances that reflect White or Coloured Light from their Interior. By Sir David Brewster, K.H., F.R.S.

3. On a Clay Deposit with Fossil Arctic Shells, recently observed in the Basin of the Forth. By the Rev. Thomas Brown, F.R.S.E.

The author having stated the circumstances which led to his discovering this bed with its fossils near the harbour at Elie, referred to a drawing of the section, and explained the position and contents of the different strata.

Specimens of the shells were exhibited, as named by Dr Otto Torrell of Lund, who had supplied important information as to their distribution. They are all, without exception, now living in the Arctic Seas. A majority of them are exclusively Arctic. Several are new to the British glacial deposits—viz., *Thracia myopsis*, *Pecten groenlandicus*, *Crenella decussata*, *C. lævigata*,* *Turritella erosa*,† and a new *Yoldia* found in Spitzbergen in 80° north latitude.‡ It was shown how strongly this evidence goes to prove the former existence of a Boreal or Arctic climate in Scotland.

The shells seem also to indicate some considerable rise in the level of the land. They are deep-water species—some of them very markedly so. Four distinct series of facts appear to show that they have not been washed up and transported, but are lying in the clay-bed where they originally lived. As the deposit is now rather above high-water mark, the fair inference would seem to be

* “Most probably, but much injured.”

† “Almost certainly this species, yet cannot be positively asserted.”

‡ The other species are—*Saxicava rugosa*, large form, *Tellina proxima*, *Astarte compressa*, *Leda truncata*, *L. pygmæa*, *Natica groenlandica*, large form. Fragments also occur which seem to belong to *Cyprina Islandica* and *Mya truncata*.

that the whole sea-bed of the Firth must have been considerably raised.

Reference was made to the discovery of the glacial beds of the Clyde by Mr Smith of Jordanhill. They had been looked for on the Forth, but without success. Dr Fleming struck the first trace of them at Tyrie, but it was faint, there being only two or three specimens of the shells, and these he was led to think not indigenous. In the Elie clay the same two species occur rather abundantly, along with others, all evidently in the clay-bed where they had lived. The group is so characteristic that there need be no question now as to the occurrence of the true old glacial beds with Arctic shells in the basin of the Forth.

Various reasons were stated for holding that this bed is very closely connected with the boulder clay, being not improbably a sea-formation contemporaneous with some portion of that deposit.

It was shown, that the facts brought to light in this section give us some glimpse into the circumstances under which the period of Arctic cold passed away.

The submerged forests of the Fifeshire coast were referred to in connection with the information which this section seems to furnish as to the somewhat obscure question of their true stratigraphical position.

4. On the Remarkable Occurrence of Graphite in Siberia. By Thomas C. Archer, Esq.

The author in this paper gives the localities of three large mines of this mineral. The first situated in the Semipalatinsk district, Western Siberia, between 47° and 50° N. Lat., and in 80° E. Long. from Greenwich, on the Kirghesian Steppe. The locality of the mine is remarkably barren, and upon digging down a few feet, the graphite is found lying in a continuous stratum which has been ascertained to extend over a space of 2100 acres. This immense deposit belongs to Messrs Samsonof and Mamontof of Ser-nopol, and is worked for commercial purposes.

The second deposit is of a similar character as to its stratification; but instead of being covered with a bed of peaty soil, as in the case of the former, it has overlying it, a stratum of spathose iron ore of