ORDINARY MEETING, MAY 6TH, 1870.

PROFESSOR MORRIS, F.G.S., President, in the Chair.

W. B. Gibbs, Esq., Edward Hill, Esq., and Francis L. Smith, Esq., were elected members of the Association.

The following papers were read :—

1.—“On the Chalk of the Isle of Thanet.”

By GEORGE DOWKER, Esq., F.G.S.

(This Paper has been published in a separate form by the Association)

2.—“On the Geology of the Neighbourhood of Swanage.”

By THOMAS D. BOTT, Esq., F.G.S.

(Abstract.)

The strata described in this communication are those occurring in the section along the coast of Dorsetshire, extending from Durlstone Head, at the south-west, to Handfast Point, at the north-east, a distance of about three miles.

Durlstone Head forms the south-western limit to Durlstone Bay, and is composed of Portland Oolite, the beds of which dip at a considerable angle to the north-east, and disappear at a short distance under Purbeck strata. The Portlandian strata are here, as at Portland and Lulworth, capped by the remarkable stratum called the “Dirt Bed.”

That this was the soil of a Purbeck forest is evident from the numerous roots of trees with portions of silicified trunks attached and standing vertically, which it contains. Cycadeous plants, locally termed “Bird’s nests,” characterise this bed, and fir cones, resembling those of the Norfolk Island pine (*Araucaria excelsa*) also occur.

We have in this terrestrial stratum evidence that the Portlandian rock for a lengthened period continued above the waters of the ocean, that after the sun and the rain had disintegrated the surface of the recently formed rock, vegetation ensued, and that after a time Cycadeous plants and lofty coniferous trees afforded a fitting habitat for insects, as well as for their devourers, the Insectivora. Doubtless also the turtle and the crocodile peopled the rivers which watered these forests of the Purbeck land.

The Purbeck strata in this locality are in all about 275 feet thick, and are divided into Upper, Middle, and Lower; respectively, 55, 70, and 150 feet thick.

The Upper Purbecks consist of argillaceous shales, marls, clays, and shelly limestones. These are mostly unfit for building purposes; but there occur in the upper part of the series thin bands of limestone crowded with *Paludina*, and called Purbeck marble, which was largely used in the construction of our cathedrals and other ancient churches. One band contains *Paludina elongata*, and another called "Marble Rag," *Paludina fluviarum* and *Cypris tuberculata*.

The Middle Purbecks are formed by a series of alum shales, marls, and limestones, chiefly of estuarine origin, but partly freshwater. Good building stone is also obtained from this division, at the base of which is the "Cinder Bed."

This remarkable bed is about fourteen feet thick, and contains in abundance *Ostrea distorta*, and some fish, and reptilian remains.

The third division, the Lower Purbecks, is made up of hard and soft marls, and limestones charged with *Cypris Purbeckensis*, and having for its base the "Dirt Bed" before mentioned.

The quarries in the Isle of Purbeck have been worked for fully six or seven hundred years, and have yielded "Purbeck marble" for some of our most celebrated cathedrals.

The following names are locally used to designate the various beds exposed in the quarries:—

Marble rag	Mock hard bed
Single leaper	Pitcher bed
Step bed	Devil's bed
Toad's eye	Thornback
Shiver	Grub
Pitching stone	Pudding
Tomb stone	Shier
White roach	

Peveril Point runs out to sea for a considerable distance, and forms the north-east boundary of Durlstone Bay, which is about a mile and a quarter across from Peveril Point to Durlstone Head.

The picturesque beauties of this bay arrest the attention of the tourist, but the curiously contorted strata of the cliffs will interest the geologist, and will dispose him to speculate upon the causes which here, as at Lulworth and Stare Cove have produced such remarkable flexures.

The town of Swanage is situated in the depression between the high range of the Purbeck hills and the lower range of cliffs of

Hastings Sands, which occupy a considerable part of Swanage bay. The Hastings Sands (the junction of which with the Purbecks is not visible) extend about 3,500 paces, after which Wealden beds are reached.

The Wealden formation is here represented by sands, clays, and calcareous grits, with masses of lignite, and yield reptilian remains, which are often strewn about the shore.

Near the foot of Ballard's Down is Punfield Cove, where, in the space of about 700 paces, we find Wealden, Neocomian, Gault, and Upper Greensand strata. As the vegetation is here abundant, it is difficult to determine accurately the extent of each series of beds ; but, roughly, the Wealden may be about 50 paces, the Neocomian 250, the Gault 200, and the Upper Greensand 250. The Gault does not appear to be fossiliferous in this place, but the Upper Greensand yields characteristic species.

The passage from the Upper Greensand to the Upper Chalk is well seen ; the Firestone or Chloritic Marl, the Chalk Marl, and the Lower Chalk all being exposed.

The Lower Chalk forms Ballard's Down, which terminates in a bold cliff 350 feet high. Beyond this point a depression marks the commencement of the Upper Chalk, which forms the northern extremity of Swanage Bay, called Handfast Point.

The chalk is here nearly vertical, as shown by the bands of flints, and the section exposed is altogether very similar to the well-known one at Scratchell's Bay, near the Needles. Here, too, are detached pinnacles of chalk standing well out, and rendering still stronger the resemblance between the two places.

How great must have been those mighty forces which produced the upheavals of which the evidences are here so abundantly found ! As there is no trace of an eruptive rock in the district, it would seem probable that one great seismic movement, beginning at White-cliff Bay, passing through the whole of the Isle of Wight to the Needles, extending to Handfast Point, and on through the Isle of Purbeck to Whitenore Bay, effected the change, and produced the phenomena, which in this beautiful locality now excite the admiration and the wonder of the visitor.