

I cannot conclude these brief and somewhat desultory remarks without expressing my deep indebtedness to MM. A. de Borre, Dupont, and Nyst, for the very kind attention they showed me when in Brussels, and the hope that it may soon be my good fortune again to visit their most attractive and hospitable capital.

II.—ON THE CHALK OF THE CLIFFS FROM SEAFORD TO EASTBOURNE, SUSSEX.

By WILLIAM WHITAKER, B.A. (Lond.), of the Geological Survey of England.

(A Paper read before the Geological Society of London, December 1, 1870.)

JUST out of Seaford the Chalk rises sharply from beneath the sand of the Woolwich Beds, on an outlier of which the small town is built. The dip however soon lessens, until the Chalk is flat, with slight waves. Some of the layers of flint are continuous, and some nearly so, but most are not continuous, and they are rather closer together in the lower part of the cliff. There are a few thin beds of hard chalk, and at the top a capping of "clay-with-flints."

This thick mass of "Chalk-with-flints" (1 of the figure) occurs again on the other side of Cuckmere Haven, and thence forms the whole of the cliff (except for the flinty soil at top and for the rubble in the hollows) almost to Beachy Head. The beds are flat as far as the Lighthouse, when they rise slightly eastward; and just before getting to the Head this uppermost division passes downwards into chalk, with layers of flints, and with cream-coloured nodular layers that weather to a rough surface (2).

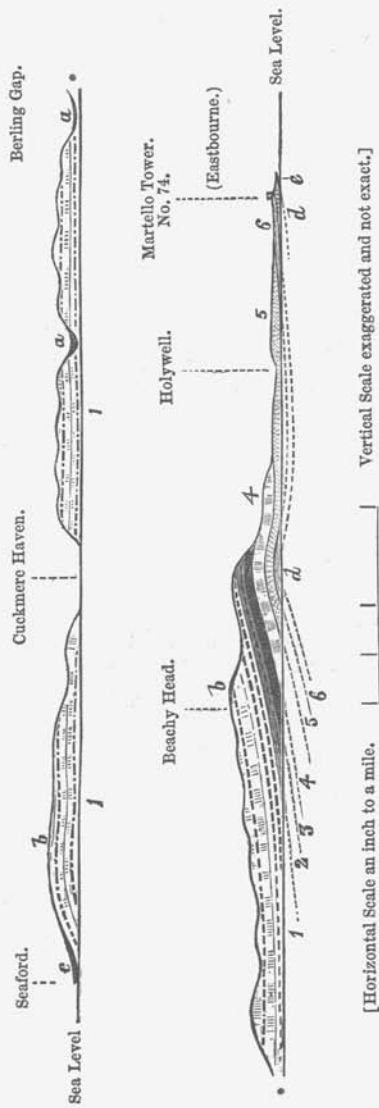
Then, from the increase of the westwardly dip, still lower beds, without flints, crop up eastwards; firstly a bed with nodular layers, as in the division above, which weather rough and give the whole a darker colour (3); and then thick-bedded massive chalk (4). All of the above four divisions occur at Beachy Head.

After rounding the first point of the Head, there are, above the Chalk-with-flints, at the highest parts (south-west of the "signal" on the map) pipes of clay-with-flints and a little red sand, which last may perhaps be the same as the Iron-sands of the North Downs referred to the Crag by Mr. Prestwich.¹ At the bottom of the cliff there rises up a mass of bedded chalk (5), in which there is a bed of pale bluish-grey marl, here indeed divided into two, and altogether fifteen feet thick; but which at Holywell House, on the north-east, is undivided and only three or four feet thick; whilst just above there are other marly beds, giving the whole a darker colour (at the lime-kiln at the foot of the cliff).

At the second point of the Head (south-east of the word "signal" on the Ordnance Map) the Chalk Marl (6) crops up from below; and on rounding the point is succeeded by the green-grey sandstone of the Upper Greensand, which is but little shown however, as there is a small under-cliff, and as the dip changes and the beds fall northwards for some way, until the Chalk Marl also is hidden (about

¹ Quart. Journ. Geol. Soc. vol. xiv. p. 322.

SECTION ALONG THE CHALK CLIFFS FROM SEAFORD TO EASTBOURNE (SUSSEX).



[Horizontal Scale an inch to a mile. Vertical Scale exaggerated and not exact.]

- | | | |
|---|--|-----------------|
| <p>{ a. Chalk and flint-rubble.
b. Clay with flints.
c. Reading Beds.
d. Upper Greensand.
e. Gault.</p> | <p>{ 1. Chalk with flints.
2. Chalk with flints and nodular layers.
3. Chalk without flints, but with nodular layers.
4. Massive (thickly-bedded) Chalk without flints.
5. Bedded Chalk without flints.
6. Chalk Marl.</p> | <p>{ Chalk.</p> |
|---|--|-----------------|

east of the l of "signal" on the Map), and the bottom of the cliff is in the division No. 5.

The dip lessens, and soon the beds are flat. There are springs at the foot of the cliff, thrown out by the marly bed in No. 5; and No. 4 ends off at the top of the cliff about half a mile southward of Holywell.

From Holywell there is a slight south-westerly dip, so that the lower beds again rise; and as the level of the ground falls north-eastward No. 5 ends off about a quarter of a mile before getting to the Martello Tower, and there is then nothing but the Chalk Marl (only 50 or 60 feet thick?) above the Upper Greensand. The former is hard at the bottom, and markedly bedded; the latter consists of green-grey and grey sandstone, coarsely bedded, with brown and green nodules in the top part, and is not very distinctly separated from the former.

Just beyond the Tower the Gault crops out: it is a light-grey sandy clay, calcareous at top, and drying hard; but only about six feet of it are shown.

On comparing this section with that of the Kentish cliffs, so well recorded by Mr. W. Phillips,¹ there seems to be a good deal of difference between the two chalk-coasts, as may be seen from the following Table, in which the divisions of the chalk in the two are correlated, as nearly as the evidence allows, though without certainty:—

<i>Kentish Coast.</i>		<i>Sussex Coast.</i>
Margate chalk, with few flints. ²		
Chalk, with many flints.	{ Chalk, with few organic remains...	1. Chalk, with flints.
	{ Chalk, with many organic remains (rough)	2. Chalk, with flints and nodular layers.
	{ Chalk, with few flints	? Absent.
Chalk, without flints.	{ Chalk with many organic remains (rough)	3. Chalk, without flints, but with nodular layers.
	{ Chalk, with few organic remains ...	4. Massive chalk, without flints.
	{ Absent, or included in the next below Grey Chalk (or Chalk Marl)	5. Bedded chalk, without flints. 6. Chalk Marl.

Possibly the highest division of the Kentish Chalk may be unrepresented in the Sussex section, and perhaps also the fifth division of the latter may be the equivalent of the upper part of the "Grey Chalk" of Mr. Phillips, which may include more than the "Chalk Marl."

III.—DENUDATION OF THE COALBROOK-DALE COAL-FIELD.

By DANIEL JONES, F.G.S.

(PLATE V.)

ALTHOUGH the Coalbrook-dale Coal-field has received a large share of the attention of geologists, the progress of mining operations reveals new facts from time to time, enabling us to explain away some of the difficulties which have beset earlier writers.

¹ Trans. Geol. Soc. ser. i. vol. v. p. 16.

² Not noticed by Phillips, as it does not occur on the coast he described. See Quart. Journ. Geol. Soc. vol. xxi. p. 395.