

GEOLOGICAL NOTES

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Geological Notes by Henry Thomas de La Beche

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BY

HENRY THOMAS DE LA BECHE,
F.R.S. F.G.S.

L O N D O N :

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I. *Notes on the Geographical Distribution of Organic Remains contained in the Oolitic Series of the Great London and Paris Basin, and in the same Series of the South of France.*

AT the present time, when rocks, so dissimilar in their mineralogical character and thickness, are referred to the same geological epochs, from the nature of their organic remains, it becomes important to ascertain, as far as our information will permit, to what extent the opinions usually entertained on this head are well founded; and if they should appear to be only partially correct, to determine to what distances, fossils, supposed characteristic, may be available. Many serious difficulties attend an examination of this nature. 1st, Very able observers of rocks may not be good zoologists, or may not have had the fossils obtained by them from particular strata, determined by those that are. 2ndly, We want synonyms for the same shells to which different names have been assigned by different authors. 3rdly, We do not possess complete lists, even of the fossils found at various known places. And 4thly, We cannot state that any given fossil discovered in one rock may not occur in another because not yet found in it. We are however in general furnished with lists of those fossils which occur most abundantly at any given place; and the organic remains, supposed characteristic, are most frequently detailed, from the very general desire, now existing among geologists, to adopt this mode of identifying strata, so that, notwithstanding the difficulties above enumerated, we may, by comparing the lists of those on whose accuracy we can depend, arrive at some useful conclusions respecting the geographical distribution of organic remains in a given group of rocks.

2 On the Geographical Distribution of Organic Remains

M. Elie de Beaumont has already remarked on the constancy of the geological facts observable in the oolitic belt of the great geological basin which contains London and Paris*;—and M. Dufrénoy† has shown that in the South of France appearances are not very materially different. Therefore we may conclude that, though there may be many subordinate differences, there is a general resemblance in the mass of the oolite series in England and a large part of France, leading to the supposition that the rocks of which it is composed were formed under similar general circumstances.

It would appear that the three systems into which Mr. Conybeare‡ has divided the oolite series of England, will be available in the parts of France comprehended within this sketch; therefore, in treating of the organic remains, we shall first consider the lower oolitic system, then the middle, and afterwards the upper.

As data whence to draw conclusions respecting the geographical distribution of the organic remains in the rocks under consideration, I shall avail myself, for the North of England, of the very excellent work of Mr. Phillips§. For the South of England I shall be compelled to use scattered information, as we have not any very detailed and published description of the organic remains contained in the oolite of this part of our island||. For Normandy I shall have recourse to M. de Caumont's work on Calvados¶. For the North of France, to the memoir of M. Boblaye**. And for the South of the same country, to the observations of M. Dufrénoy††.

In order that the reader may judge of the general character of the oolite series of which the fossils will be noticed in the sequel, I have brought together the views of the geologists above named respecting the different portions of which they have particularly treated.

*Note sur l'uniformité qui regne dans la constitution de la ceinture Jurassique du grand bassin géologique qui comprend Londres et Paris.—*Annales des Sciences Naturelles*. Juillet 1829. † *Annales des Mines*. 1829.

‡ *Outlines of the Geology of England and Wales*.

§ *Illustrations of the Geology of Yorkshire*.

|| The lists of organic remains of the oolite contained in the well known "Outlines," &c. of Conybeare and Phillips, are much too general to be of service in inquiries of the present kind; but when local information could not be obtained, I have employed them for the midland and South of England, which principally afforded the materials for their construction.

¶ *Essai sur la Topographie Géognostique du département du Calvados*. Caen 1828.

** *Mémoire sur la formation Jurassique dans le Nord de la France*.—*Ann. des Sci. Naturelles*. Mai 1829.

†† Des formations secondaires qui s'appuient sur les pentes méridionales des montagnes anciennes du centre de la France.—Part entitled "Formations Jurassiques du Sud-ouest de la France".—*Annales des Mines*, tom. v. 1829.

General View of the Oolite Formation of Yorkshire (according to Mr. Phillips),*

a.	Kimmeridge clay	depth uncertain.
b.	Upper calcareous grit	60 feet.
c.	Coralline oolite.....	60
d.	Lower calcareous grit	80
e.	Oxford clay	150
f.	Kelloways rock.....	40
g.	Cornbrash limestone	5
h.	Upper sandstone, shale, and coal.....	200
i.	Impure limestone (Bath oolite).....	30
k.	Lower sandstone, shale, and coal.....	500
l.	Ferruginous beds (inferior oolite).....	60
m.	Upper lias shale.....	200
n.	Marlstone series.....	100
o.	Lower lias shale.....	500

Under the heads of different districts Mr. Phillips presents us with more detailed tabular views, from whence the following are selected :

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|-----------------------|---|---|
| In the Tabular Hills. | { | 1. Upper calcareous grit, containing fossils resembling those in No. 3. |
| | | 2. Coralline oolite, marked by corals, echini, plagiostomæ, melanisæ, &c. |
| | | 3. Lower calcareous grit, pinnæ, gryphææ, ammonites, &c. |
| | | 4. Gray argillaceous earth, containing many fossils at the bottom. |
| | | 5. Ferruginous or argillaceous sandstone, with remarkable gryphææ, ammonites, &c. (Kelloways rock of the S.)† |
| Moorland District. | { | 6. Impure, sometimes oolitic limestone, full of shells, (the cornbrash of geologists). |
| | | 7. Sandstone, shale, ironstone, and coal, with carbonized wood, ferns, and other fossil plants. |
| | | 8. Impure, often oolitic limestone and ironstone, with many fossil shells (oolite of Bath). |
| | | 9. Sandstone, shale and coal, with carbonized fossil plants. |
| | | 10. Subcalcareous, irony sandstone, often containing shells, called <i>dogger</i> (inferior oolite). |
| | | 11. Upper lias shale, or alum shale, with nodules of argillaceous limestone, ammonites, belemnites, &c. |
| | | 12. Ironstone and sandstone strata, with terebratulæ, pectines, cardia, aviculæ, &c. |
| | | 13. Lower lias shale, with gryphææ, pinnæ, plagiostomæ, &c.‡ |

* Illustrations of the Geology of Yorkshire, pp. 32, 33. † Ibid. p. 43.
 ‡ Ibid. p. 35. B 2 General

4 *On the Geographical Distribution of Organic Remains*

General View of the Oolitic Series in Somersetshire and Wiltshire.

It would be quite out of place to present a general view of this part of our island, as the labours of Smith and Conybeare are well known, and as the rocks in question constitute the type of the oolitic series generally, if we except the Portland beds.

It may be remarked that the Bath oolite does not occur on the coast of Dorsetshire. A series of clays with limestone, resembling forest marble and cornbrash largely developed, there separate the inferior oolite from the Oxford clay.

The coral rag, as is often the case, is also wanting on the same coast; that is to say, the beds containing such an abundance of corals, whence the name, do not occur, though an equivalent to the Oxford oolite does.

General View of the Oolite Rocks of Normandy (according to De Caumont).*

1. Argile de Honfleur (Kimmeridge clay). Glos sandstones, considered subordinate.
2. Calcaire de Blangy.
3. Coral Rag, consisting of a series of beds containing many oolites

* In my paper "On the coasts of France, and of the inland country adjoining; between Fecamp to St. Vaast," inserted in the 1st volume of the Geological Transactions, New Series, and written from observations made in the spring of 1821, deceived by the mineralogical resemblance of this limestone, as developed at Hennequeville cliff, to some of the Portland stone, I attributed the Calcaire de Blangy to that rock: but I now perfectly agree with the French geologists, that the Honfleur and Havre clay is equivalent to the Kimmeridge. Subsequent examinations have shown me that this is very probable; consequently it was an error to refer the limestones in question to the Portland stone.

The following section, by M. de Caumont, of Hennequeville cliff, shows the superposition of the Kimmeridge (Honfleur) clay, the Calcaire de Blangy, and the coral rag.

1. Chalk with gray flints, and numerous alcyonia	about 100 feet.
2. Green earth	40
3. Argile de Honfleur	60
4. The same, alternating with many beds of ferruginous sandstone full of quartz grains and globules of oolitic iron	} 20
5. The same, alternating with many beds of more compact sandstone, and full of broken shells forming a kind of lumachella	} 10
6. Sandstone more siliceous than the preceding, containing fewer shells	} 6
7. Siliceous limestone, very hard, containing globules of oolitic iron	} 1
8. Whitish and slaty siliceous limestone	3
9. Limestone resembling No. 7	2½
10. The same, full of the interior casts of trigoniae	1½
11. Many beds more or less hard, resembling the preceding	3
	12. Bed

oolites and corals, passing, in the lower part, into a ferruginous and calcareous sandstone (calcareous grit of the English).

4. Argile de Dives (Oxford clay). Black blue clay, rarely yellowish: in the upper part, subordinate beds of oolitic limestone; in the lower, marly limestone of a gray, yellowish or blue colour, apparently represents the Kelloway rock.
5. Cornbrash?
6. Forest Marble, consists of a series of beds more or less oolitic, and more or less sublamellar, is very often fissile, and contains fragments of shells and corals.
7. Great Oolite. Upper beds sometimes resemble forest marble; middle and lower beds of a finer grain, rarely oolitic, not sublamellar, often as soft as chalk. Caen stone belongs to this division. M. de Caumont considers the clay of Port-en-Bessin as equivalent to the Caen stone.
8. Inferior Oolite. Upper part resembles the Caen stone; connection between the great and inferior oolite. In the lower part, two or three beds of yellowish or gray calcareous sandstone, containing ferruginous oolites; full of shells.
9. Lias. Upper part contains belemnites; and the lower, the *Gryphæa incurva*.—There seems an equivalent of the sand and marlstone of Smith upon the top of the lias.

The above is condensed from the general descriptions contained in the *Essai sur la Topographie Géognostique du Département du Calvados*. It will be found not to differ materially from the general view I presented in my paper on Normandy, if the Portland beds be withdrawn and the marl and marlstone there noticed be considered equivalent to the Kimmeridge clay, except indeed that M. de Caumont considers the Port-en-Bessin marls as representing the Caen stone.

General View of the Oolite of the North of France (according to M. Boblaye).

The rocks of this class which M. Boblaye had occasion to observe,

12. Bed of black flint, passing into a gray sandstone, and } finally into the limestone	½ feet.
13. Many limestone beds passing into sandstone.....	4
14. Yellowish limestone without shells, many beds	5
15. White marl.....	1
16. Yellowish white limestone containing casts of spiral shells...	6
17. Whitish marl	1
18. Limestone resembling No. 16.....	2
19. Limestone full of corals (coral rag).....	6
20. The same, more compact	5
21. Oolite of the coral rag	6

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