

of local Lower Boulder-clay. The more the subject is investigated, the more one becomes convinced that the Upper Boulder-clay is the newest glacial or *interglacial* deposit in the N.W. of England.

The shell-bearing gravel-and-sand around Macclesfield, which according to Mr. Sainter (*GEOL. MAG.*, Vol. II., pp. 366, 368) ranges from 600 to 1200 feet above the sea-level, is I believe an upward extension of the middle drift of the plain of Cheshire. The deposit on Moel-y-Tryfan is not so finely stratified, and the stones are not so much rounded as in the gravel at lower levels; but it agrees with the gravel-and-sand of Anglesey in the large boulders being found at its base (though a few are scattered through its mass), and with the Cheshire and Lancashire middle drift in the character of many of its erratics, including Eskdale and Criffell granite, chalk-flints, etc. Mr. Darbshire says it is capped with clay (*GEOL. MAG.*, Vol. II., p. 295); though this I missed seeing.

The following is the sequence of the drift deposits of the N.W. of England and a part of Wales (order descending):—

Red clay, with grey or blue partings; rather few stones and exceedingly few large boulders; more or less marly in its lower part; extensively used for bricks. Maximum thickness unknown.

Gravel and sand, with subordinate beds of clay and loam. Maximum thickness in Cumberland 120 feet; at Gresford, near Wrexham, 150 feet; at Kersal Moor, Lancashire, 200 feet (Hull).¹

Madder-brown clay, with subordinate beds of laminated loam, seams, pockets, and lenticulations of sand; numerous stones, and at intervals many large boulders; vertical or oblique fractures; often rudely stratified; graduating into a still harder, more gritty, and stony clay, with a tendency to arched stratification, in the neighbourhood of the hills (Finel); in general not well adapted for bricks. Maximum thickness at Lindal, Furness, 120 feet.

Blue or greyish-blue clay, with many stones and at intervals many boulders. Maximum thickness at Colwyn, N. Wales, not less than 60 feet.

The above drifts have been found to be shell-bearing with the exception of the blue clay and the pinel. The best sections may be seen on the sea-coast.

D. MACKINTOSH.

MR. W. S. MITCHELL ON THE "DENUDATION OF THE BATH OOLITE."

SIR,—I believe Mr. Mitchell is of opinion that the hills of Bath Oolite were simply old coral-reefs, and did not owe their form to denudation. (See *Quart. Journ. Geol. Soc.*, 1871, vol. xxvii., p. 228.)

I was staying near Bath in the Spring of 1869, and discovered, in a shallow excavation on the left of the road on Kingsdown, beyond Bathford, some beautiful specimens of Oolitic Corals—the finest which have been obtained from the neighbourhood of Bath—the best of which I gave to Mr. Charles Moore, for the Bath Museum. They consisted of several genera and species, and occurred at one portion of the excavation; the space which they occupied being a few yards across, and appearing to be a section of a small coral reef, bounded on each side by the usual limestone. It is possible this bed increases in width, vertically.

Corals appear to be of rare general occurrence in the Bath hills;

¹ In the Vale of York this formation is associated with deposits of finely laminated clay of various colours.

and the coral-reefs, I should think, were merely local, and of limited extent, and do not constitute their mass, which consists, probably, merely of the contents of an Oolitic sea.

HENBURY, BRISTOL, *March 8, 1872.*

SP. GEORGE PERCEVAL.

OBITUARY.

CALEB BURRELL ROSE, Esq., F.G.S., F. R. Med. and Chirur. Soc. Lond.¹

WE regret to have to record the loss of C. B. Rose, Esq., M.R.C.S., F.G.S., of Great Yarmouth, Norfolk. Mr. Rose was born at Eye, in Suffolk, 10th February, 1790, and spent the greater part of his life in the active duties of his profession, as a medical man, at Swaffham, in Norfolk. His leisure hours were, however, devoted from an early period to the study of geology.

He was a contemporary of, and fellow-labourer with, the late Mr. Samuel Woodward, Author of an "Outline of the Geology of Norfolk," published in 1833, etc., etc. Mr. Rose published a "Sketch of the Geology of West Norfolk" in the "London and Edinburgh Philosophical Magazine and Journal of Science," 1835, vol. vii. pp. 171, 274, 370, and 1836, vol. viii. p. 28 (published also in a separate form, Swaffham, 1836); a treatise "On the Cretaceous Group in Norfolk," (Geologists' Association, November 8th, 1862); besides papers published in the Quart. Journ. Geol. Soc. 1846, vol. ii. p. 32; the British Association Reports, Belfast, 1852; Cambridge, 1862; Norwich, 1868; the Transactions of the Microscopical Society; the GEOLOGICAL MAGAZINE, 1864, Vol. I., p. 92, "On Cycloid Fish-scales in the Oolitic Formation;" 1865, Vol. II., p. 8, "On the Brick-earth of the Nar;" 1867, Vol. IV., p. 29, "On the Cretaceous Groups of Norfolk and Kent."

Mr. Rose showed the true position of the Red Chalk of Hunstanton, and that the "Carstone" should be referred to the Cretaceous and not to the Oolitic series. The curious deposit known as the "Nar Valley Clay," or "Brick-earth," was explored by Mr. Rose, who collected a large series of the shells found in it, which proved it to be one of the latest marine deposits in Norfolk, later than the Crag or even the Boulder-clay series.

After retiring from practice, he resided at Yarmouth, where he drew the attention of Mr. Prestwich to the remarkable well-section at Sir E. K. Lacon's Brewery, in which the London clay and Woolwich and Reading series were passed through. (See Quart. Journ. Geol. Soc., Nov. 1860.)

Mr. Rose also discovered the interesting fossiliferous bed at Aldeby, which has yielded so large a collection of fine Crag-shells.

He was most active in promoting the successful reception of the British Association at Norwich, in 1869; and it is to be feared he never recovered from the exertions he made at that time.

He was elected a Fellow of the Geological Society of London in 1839, and died at Yarmouth, on 29th January, 1872, in his 82nd year.

Previous to his decease, Mr. Rose gave his collection to the Norfolk and Norwich Museum.

¹ For some of these particulars we are indebted to J. Prestwich, Esq., F.R.S., V.P. Geol. Soc., and to T. G. Bayfield, Esq., of Norwich.