

In the Shingle beds of Leyland, Euxton, Chorley, Preston, Lancaster, and Blackpool,* Mr. De Rance has obtained nearly thirty species.

In Eastern Yorkshire, Mr. Searles V. Wood, Jun., has divided the glacial deposits into "Purple Clay without Chalk," "Purple Clay with Chalk," and "Chalky Clay," the whole being later than his "Middle Glacial Sands and Gravel," which, in East Anglia, are overlain by the "Chalky Clay," and rest unconformably upon the "Contorted Drift" of Norfolk, the Cromer Till, and the Forest Bed. His three Yorkshire clays are, however, considered by most northern geologists to be the representatives of the "Upper Boulder Clay" west of the Pennine Chain, the "Chalky Clay" having been formed before the country had sufficiently subsided to allow the sandstones and marls, furnishing the red colouring matter, to have suffered denudation; while the "Purple Clay without Chalk, and with Shap Granite," was deposited when all the chalk was mainly beneath the sea, and the granite from Shap Fell, which had been broken up by breaker-action during the Middle Sand era, was floated across the passes of the Pennine Chain and southwards and northwards. A solitary pebble of Shap granite has been found by Mr. De Rance at Hoylake, in Cheshire; and many of Criffel Granite, in that county, and on the coast of North Wales, by Mr. Mackintosh, who has also traced the flow of this granite in the low country lying north and south of the Cumberland mountains.

At Bridlington, in Yorkshire, occurs a deposit at the base of the "Purple Clay," with a truly Arctic fauna. Out of seventy forms of mollusca recorded by Mr. S. V. Wood, Jun., nineteen are unknown to the Crag—of these thirteen are purely arctic, and two not known as living.

Shells have been found in the Upper Boulder Clay of Lancashire, at Hollingworth Reservoir, near Mottram, by Messrs. Binney, Bate-man, and Prestwich, at an elevation of 568 feet above the sea, consisting of *Fusus Bamffius*, *Purpura lapillus*, *Turritilla terebra*, and *Cardium edule*. The clay is described by Mr. Binney as sandy, and brown-coloured, with pebbles of granite and greenstone, some rounded and some angular. All the above shells, as well as *Tellina Balthica*, have been found in the Upper Clay of Preston, Garstang, Blackpool, and Llandudno, by Mr. De Rance, who has also found all the above species (with the exception of *Fusus*), as well as *Psammobia ferroensis*, and the siliceous spiculæ of marine sponges, in the Lower Boulder Clay of West Lancashire. He has described the ordinary red Boulder Clay of Lancashire as extending continuously through Cheshire and Staffordshire into Warwickshire,

* The typical species in West Lancashire are *Tellina Balthica*, *Cardium edule*, *C. aculeatum*, *C. rusticum*, *Psammobia ferroensis*, *Turritella terebra*.