

some way below this are three bands of dirty-grey sand. All these bands are lenticular. Some time ago Mr. John Mackie, one of our members, described * alternating ash- and sand-beds which occurred at Crofthead Mills in the same neighbourhood, but those presently under notice are at a much higher level, and of entirely different quality. In neither case, however, was there any appearance of stratification. I have seen nothing of these beds in the Carboniferous system, the material resembling very closely in colour the refuse from chemical works known as "Blue Billy." They are so pure that unless comparatively recent it is difficult to account for their occurrence. No Boulder-clay has been detected under any of them, but if the coarse gravel bed which lies above them belongs to Drift period date, they may be pre-glacial, and perhaps of late Tertiary age. We have abundance of so-called Tertiary dykes, and why not Tertiary ash-beds?

(5) ON A FRESHWATER LIMESTONE UNDERLYING A MARINE LIMESTONE, NEAR PAISLEY.

THIS limestone occurs in an old quarry at Jenny's Well, near the White Cart Water, between Blackhall and the Cart Bridge. The section is as follows:—

Limestone with Crinoids and Marine Shells, space grassed over (say),	- - - - -	24 inches.
Limestone with a few Freshwater Ostracoda,	- -	8 "
Oil-shale crowded with Freshwater Ostracoda, and (in part) with Fish Remains,	- - - - -	14 "
Limestone with a few Freshwater Ostracoda,	- -	7 "
Shale (soft) with Freshwater Ostracoda,	- -	20 "
Limestone crowded with Freshwater Ostracoda,	- -	4 "
Surface of Water in Quarry,	- - - - -	—

All these Ostracoda appear to belong mostly to the genus *Carbonia*.

In Craigenglen, Campsie, there are thin bands of freshwater limestone, as was pointed out by the late Dr. John Young in his Campsie Monograph.† If the Paisley horizon is a continuation of the Craigenglen one, it will therefore be some distance below the Campsie Main Limestone series. Whatever position it occupies,

* *Transactions*, vol. xi., part 2, 1900, page 299.

† See page 38 in "The Geology of the Campsie District." By John Young, LL.D., F.G.S. (*Trans.*, vol. i., part 1), 3rd ed., 1893,

the under limestone beds in it are, so far as I know, the only freshwater limestones south of the Clyde in the Carboniferous Limestone series.

(6) ON THE BOULDER-CLAY AT HAMILTON HILL,
NORTH OF GLASGOW.

WITH a few other members I visited, on 27th January, 1900, and for the first time, the exposure of Boulder-clay at Hamilton Hill, but unfortunately the section could not be approached on account of the great quantity of material which had slid down the face after the recent heavy rains. An examination of the heaps of boulders lying near, and which had been picked from the clay, showed that the bulk of them were local—say, from within a radius of 10 miles, and that a few more were from as far as Glen Falloch and Loch Garabal granitic area east of Loch-fyne-head. What struck me most was the appearance of the clay itself, as it was strongly, though not completely, of the greywacke type, or, in other words, that it had in great part been derived from metamorphic rocks.

There are here, then, three remarkable facts:—1st, the stones and boulders are principally local; 2nd, a small number of them are from a distance; and, 3rd, the clay, in bulk, has come from a distance, as well as a large number of small and minute stones. There are no sand-beds in the deposit, and from its uniform colour the conditions which prevailed during its deposition must have been very equable, and must therefore have formed only a single episode in the great glacial epoch. The surrounding district for miles is composed of Carboniferous strata, and therefore the Hamilton Hill Boulder-clay cannot be a so-called "ground-moraine" derived from local rocks. More probably it was laid down in sea-water, which was kept constantly charged with mud carried in by streams flowing from underneath Highland glaciers, and from the melting of floating ice.