

magnesian limestone, and that the 5 to 15 per cent. of magnesium carbonate contained in them is a mere impurity, when compared with the 30 per cent. in the matrix from which they have arisen. It is interesting to come across a similar statement made in 1817, though we waited long for Professor Garwood's numerical proofs, and for a complete account of the mode of origin of the concretions. Mr. N. J. Winch (Transactions of the Geological Society of London, vol. iv, p. 9) remarks that "botryoidal masses of fetid limestone devoid of magnesia, in balls varying from the size of a pea to two feet in diameter, imbedded in a soft, marly, magnesian limestone, are found at Hartlepool, etc." Winch had given a specimen some twelve years before to James Sowerby ("British Mineralogy," table 38), and the passage above quoted was incorporated by Conybeare & Phillips in their "Geology of England and Wales," 1822, p. 306. GRENVILLE A. J. COLE.

DUBLIN, *March* 1, 1901.

SUCCESSION OF STRATA IN THE YOREDALE ROCKS.

SIR,—Mr. Dakyns is right in his criticism on the succession I quoted for the Yoredale strata of the Yore Valley. It is true that the sequence, though there are many exceptions, is usually—

Shale.  
Limestone.  
Sandstone.

But this may be put in another way. The series as a whole is made up of repetitions of this threefold cycle, and may with equal correctness be regarded as consisting of repetitions of the cycle—

Sandstone.  
Shale.  
Limestone.

We have, therefore, the same evidence of intermittent and more or less rhythmic sedimentation which I claimed for the Coal-measures. But there is this difference, that whereas in the Yoredales the cycle commences with inactivity (limestone) and proceeds to rapid sedimentation (sandstone), in the Coal-measures it commences with activity (sandstones and conglomerates) and proceeds to stagnation (coal-seams), the order being—

Coal.  
Shale.  
Sandstone and conglomerate.

Both formations result from rapid sedimentation over a subsiding area, but whereas the Coal-measures are essentially estuarine, the Yoredale rocks of the type developed in the Yore Valley bear every sign of having been laid down in open sea; the one was a product of the shallowest water, the other of comparatively deep water. Herein probably lies the explanation of the reversal of order of events.

I am obliged to Mr. Dakyns for the correction.

A. STRAHAN.

*March* 6, 1901.