

FOSSILS ON CLEAVAGE PLANES.

SIR,—The Rev. W. Downes, who has done good service among the Limestones of Westleigh and Holcombe Rogus, in Devonshire, has in a second paper on this subject [Trans. Devon Assoc. 1879] brought forward the question, "Is it absolutely a universal rule that fossils do never occur otherwise than on a plane of bedding?" He notices his discovery of organic remains, referred by Prof. T. R. Jones to *Posidonomya*, on a surface of rock which is unquestionably a cleavage plane. Among his specimens from Westleigh is a *Spirifer* manifestly imbedded in a vertical position, while upon the same piece of rock a *Chonetes* and a *Posidonomya* are lying upon the plane of bedding. He suggests, that the planes of separation will be determined by the lines of least cohesion, and that the presence of a flattish fossil, approximately parallel to the lines on which the cleavage force was acting, would be apt to create a plane of weak cohesion on which the external pressure would most readily take effect. We should have been disposed to think that the position in which the fossil was imbedded accidentally coincided with the cleavage plane, and it was therefore saved from distortion. Mr. Downes however remarks that the cleavage is of an irregular kind; seeming often to result from the folds of the hard limestone rocks crushing the intervening shaly beds. The subject is one well worthy of attention. H. B. WOODWARD.

RIPON SWALLOW-HOLES.

SIR,—The Rev. J. S. Tute of Markington, near Ripon, has a notice of these "natural pits" in Vol. V. GEOL. MAG. page 178. That the denuding agencies employed in producing them are no more dormant now, than formerly, is certain. The latest subsidence occurred in '77, in the West Field, near Hutton Conyers. This field is pitted over with holes of more ancient date, and there also, cylindrical-shaped holes, locally known as "man-holes," appear at intervals. When first found, they are seen to contain water, which soon disappears. To prevent animals falling in, they are filled up as quickly as possible. A "man-hole" that has been closed, after a time, becomes again an open shaft, when the material with which it had been filled is found to have been "swallowed." The subsidence of '77 is a hole of very considerable dimensions, in shape an inverted cone, the walls being thick-bedded red sandstone. It is fenced round. About one hundred yards from it, and abutting on the footpath leading from the village to Ripon, there is a shallow basin-shaped depression in the surface of the soil. This place has been watched for a number of years by a gentleman residing in the village,² who finds it sinks four or five inches in a year.

The "man-holes" are said to occur, mostly, during very wet seasons, and some of the farmers think after sheep have cleared the land of turnips.

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NORTHALLESTON, Nov. 1879.

H.M. Geol. Survey.

¹ Also a full account in a paper read at Ripon, before York. Geol. Society, in 1869.

² Mr. Thomas Wells, of Hutton Conyers.