

7th. In the Openshaw boring, the Upper Permian beds are overlaid by 36 feet of true Triassic Bunter beds.

8th. Looking to the westerly attenuation of these Permian beds, there is no matter of surprise in their comparative thickness at Bedford Leigh and Ashton, and their absence at Winwick and Farnworth.

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THE PERMIAN AND TRIAS.

SIR,—Permit me to reply to Professor Hull's remarks in your last number on my paper on the so-called Permian Rocks near St. Helens (*GEOL. MAG.* Dec. II. Vol. VIII. 1881, p. 433).

In this paper I trace the range of these unfossiliferous rocks, showing that they are similar to the Lower Mottled Sandstone of the neighbourhood, and that they thin out without unconformity with this subdivision of the Bunter in those very directions, in which, had they been Permian unconformably overlapped, they might have been expected to develop. They are thus completely separated from those rocks which are referred to by Professor Hull as containing Permian fossils wherever they occur along the border of the Coal-field, and as being unconformably overlain by the New Red Sandstone. On these grounds I ventured to doubt the correctness of their determination as Permian; Professor Hull merely repeats his belief in its correctness, without offering any explanation of the difficulties which arise in the way of its acceptance.

I also defined an area (including the village of Winwick) in which I considered Permian to be absent. Professor Hull refers to a shaft at Abram, in which these rocks have been proved, as being near Winwick, and as not being described by me. Abram is nearly six miles from the village of Winwick, and about half that distance from the town of Wigan. It is not only outside the area I defined as being devoid of Permian, but is more distant than the Edgemoor section, to which I alluded for the purpose of showing the nearest known occurrence of these rocks.

To defend myself from the charge of presumption in forming an opinion opposed to that of the late Mr. Binney and Professor Hull, I may mention that since Mr. Binney's original examination of this locality and Professor Hull's subsequent survey, when a brewery well and a quarry were the only sources of information, seven shafts at three collieries and three bore-holes have been sunk, all throwing light on the true relations of these rocks, and showing, among other points, that shales equal in thickness to the so-called Permian Marl of St. Helens are not unknown in the Lower Mottled Sandstone of that neighbourhood. My visit was not a flying one, as suggested by Professor Hull; my repeated examinations of the district resulted from instructions, officially received, to make a detailed survey of the whole area in question.

A. STRAHAN.

MARKET RASEN, Nov. 11, 1882.