

is higher and less diversified in the east than in the centre of the Kingdom; but in the extreme west it begins to rise again, so that if a certain portion of France had been included, the map would probably have shown the existence of a great surface-trough with a nearly north and south direction.

### III.—ON THE OCCURRENCE OF THE RHÆTIC BEDS IN NORTH SHROPSHIRE AND CHESHIRE.

By GEO. MAW, F.G.S., F.L.S., etc.

THE outlying mass of Lias on the borders of Shropshire and Cheshire is so thickly covered with Boulder-drift, that its line of boundary throughout almost its entire circumference is very obscure. The direct sequence from the underlying Keuper Marls is scarcely anywhere visible, and I believe no record of the occurrence of the *Avicula contorta* zone has hitherto been published.

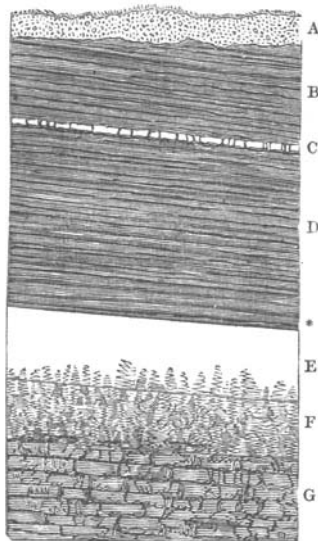
About three years ago I noticed near Audlem an exposure of fissile shale, closely resembling the "Paper-shales" of the Garden-cliff and other Gloucestershire sections, and more recently procured a small series of fossils confirming their identity with the Rhætic beds.

The strata represented in the accompanying section, Fig. 1, occur in a lane-cutting, near Audlem Mill, immediately to the south of Audlem Railway Station. They dip about  $7^{\circ}$  to the east, and include the following beds:—A, drift of variable thickness; B, about 8 feet of black fissile shales (Paper-shales); C, hard band of rock, about 6 inches thick; D, a repetition of black flaky shales, about 15 feet thick, passing downwards into a light buff marl, E, 6 feet thick; but the junction is obscured by the Railway Bridge. The buff marl graduates into soft red Keuper marls, F, about 5 feet thick, succeeded by hard variegated marl, G, exposed in the bed of the brook.

The black shales, D, abound with *Avicula-contorta*, and Mr. Etheridge, who has kindly examined the fossils for me, has also determined, in the shales, D, *Pullastra arenicola* and *Cardium Rhæticum*; and in the bed B, an *Azinus* and *Pullastra arenicola*.

I could find no continuous sections showing the junction of these

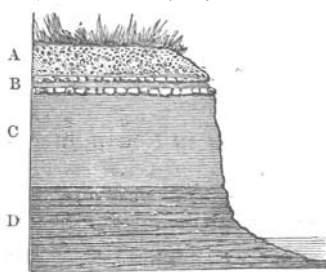
FIG. 1.



Section near Audlem Mill.

\* Junction not visible.

beds with the overlying Lias, but about half a mile higher up the stream to the east, the bank, 14 feet high (Fig. 2), presents the following section—A, drift, two or three feet thick; B, limestone bands, three or four inches thick, with obscure casts of fossils; c, dun-coloured sandy shales, eight feet thick; d, bluish-black fissile shales of unknown thickness, occurring in the bed of the brook, and closely resembling B or D in section, Fig. 1, of which it may possibly be the upper portion.



Section half a mile SE. of Audlem.

Mr. Etheridge has determined from these beds *Myacites auconoides*, *Modiola minima*, and *Pullastra arenicola*, and suggests that the bed c, containing *Myacites*, is probably Lower Lias. I failed to find *Avicula contorta* in any part of this section.

#### IV.—ON THE LOWER SILURIAN ROCKS OF GALASHIELS.

By CHARLES LAPWORTH, Esq.

##### PART I.

##### (PLATE VIII.)

THE Lower Silurian rocks of Scotland, largely developed as they are in the south, and in spite of the great labour that has been bestowed upon them, are by far the least known of all the fossiliferous formations of that country. While the maps of the Government Geological Survey are coloured in all the subdivisions of the strata of the other formations included in their area, the Lower Silurians are merely indicated by a common purple tint, and not the slightest attempt at a subdivision is made. Even the single bed of Limestone they contain, below the horizon of that of the W. coast, is doubtfully referred to the Llandeilo, and the sign of interrogation is carefully placed before its title. Nicol, Harkness, J. C. Moore, and many other eminent geologists, have worked different portions of these ancient deposits since the publication of "The Silurian System," but as yet very little progress has really been made in correlating its different parts with those of the type formation of the sister country.

Now, this want of accurate information is due to two causes. 1st—The strata are so rapidly folded and contorted, and are consequently so intricate and confused, while, at the same time, they present so few differences lithologically, that anything like a physical separation of its masses is well nigh impossible; and 2nd—The whole formation, with the exception of a few isolated bands of Limestone towards the west, and some bands of Anthracitic shale that make their appearance about the geographical centre of the system, seems to be nearly destitute of organic remains.