

The leaves have never been drifted from afar; they are often still adhering to the twigs. The leaves are flat and perfect, rarely even rolled and crumpled, as dry leaves may be, if falling on a muddy surface; still more rarely have they fallen edgeways and been imbedded vertically. They are, moreover, not variously mixed, as they should be if they had been carried for any distance, but are found in local groups of species. For example, all the leaves of *Castanea* have been found in one clay patch, with *Iriartea* and *Gleichenia*; none of these have been found elsewhere. A trilobed leaf is peculiar to Studland; the Alum Bay *Aralia*, the peculiar form of *Proteaceæ*, the great *Ficus*, and other leaves occur at Alum Bay only. Each little patch at Bournemouth is characterized by its own peculiar leaves. Such a distribution can only result from the proximity of the trees from which the leaves have fallen. The forms of most temperate aspect are best preserved, so that, to be logically applied, the Drift theory requires the palms, etc., to have been drifted upwards. To suppose that most delicate leaves could have been brought by torrents 400 miles from Mull or 200 miles from Wales, and spread out horizontally in thousands, without crease or crumple, on the coast of Hampshire, may be a feasible theory to Mr. Searles V. Wood, jun., but will not recommend itself to the majority of thinkers. But without invoking these lengthy voyages, the requisite height might have existed near at hand in the granite region of Devon, during the Eocene time. However this may be, so obviously simple an explanation as that the temperate forms grew on high ground and were drifted down and mingled with those growing on lower levels, had of course escaped no worker on these or similar floras, and has been duly considered and abandoned by every one.

J. S. GARDNER.

IS THERE A BASE TO THE CARBONIFEROUS ROCKS IN TEESDALE?

SIR,—Some years ago, when out on a geological tour, I crossed over the Pennine Chain from Appleby, in Westmoreland, to High Force in Upper Teesdale. My route was first along the Eden valley plain to High Cup Gill Beck; next up the side of this Gill to High Cup Nick, at the head of the Beck; thence across to Maize Beck, which is a tributary to the Tees, following down the south side of this beck to Caldron Snout, and continuing on from here down the side of the Tees to the old Pencil Mill, where my attention was arrested by observing the shale, here exposed, to have a striking resemblance to the Silurian shales which I had noticed at the foot of High Cup Gill, on the other side of the chain, and at other places in the Lake District, also on the east side of this district, in Wastdale Beck, near Shap Wells. The Carboniferous strata rise from the vicinity of the old Pencil Mill, in a westerly direction, on the line of the route just sketched, and crop out on the west slope of the chain in High Cup Gill Beck, where there is to be met with one of the finest sections of the Carboniferous rocks in the North of England. In the lower part of this Gill there is a very thick section of

Silurian rock exposed. The north side of Murton Pike forms the south side of the Gill here, and is almost entirely Silurian rock; indeed, the west side of this Pike is wholly Silurian up to its summit. Next, further up the Gill, is the Old Red Sandstone. Then still higher up occur the escarpments of the alternating limestones, sandstones, and shales of the Carboniferous series, including the Melmerby Scar Limestone, which is the thickest bed of limestone on this part of the chain. Above this series, at the head of the Gill, we come to the Whin Sill, where a considerable quantity of its débris lies at its foot. More Carboniferous rocks take on above the Whin Sill, and slope backward each way to form the summit of the ridge on the north and south sides of the Nick. As to the thickness of the strata from the base of the Carboniferous rocks, in this section, to the bottom of the Whin Sill, I cannot do more than give a probable estimate, and will venture to put it down at about 1000 feet. Should this thickness be near the truth, as I expect it may, and if the same thickness, or nearly so, occurs from the base of the Carboniferous rocks to the bottom of the Whin Sill, at the old Pencil Mill, then, I think it may be fairly concluded that, the Silurian-like shale, at this place, is not real Silurian, but indurated Carboniferous shale, and, therefore, the base of the Carboniferous rocks must be considerably below the bottom of the valley of the Tees at either Falcon Clints or the old Pencil Mill. The section at High Force, about two miles further down the Tees from this place, affords additional evidence, corroborative of the soundness of the conclusion, that the base of the Carboniferous rocks cannot be seen in Teesdale. I may here refer Mr. Dakyns, or any of your readers, to that brief abstract of a paper on this section, by C. T. Clough, Esq., B.A., F.G.S., in the GEOLOGICAL MAGAZINE for October, 1876, page 474.

Before leaving the subject, I may, however, state that there is a possibility of some peculiar positions of the strata, such as a great upward bend, or the upcast of a considerable dislocation, bringing the base of the rocks in question to view. The Burtree Ford dyke has a course nearly north and south; it ranges up the east Allen to the west of Allenheads, thence through Weardale, at Burtree Ford; and Mr. Forster, in his section of the strata, states that it crosses the Tees at Cronkley Scars. In Weardale this dyke brings rocks up to view, which would not have been seen, had the dyke not existed.

There is some probability that it might produce a similar effect where it crosses through Teesdale; but whether it does so or not, will be known by those who are better acquainted with the rocks in that part of Teesdale than I am.

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BOLTSBURN, EASTGATE, DARLINGTON,
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IS THERE A BASE TO THE CARBONIFEROUS ROCKS IN TEESDALE?

SIR,—My friend Mr. Dakyns, in the last Number of your MAGAZINE, asks the question, "Is there a base to the Carboniferous rocks in Teesdale?" Permit me, on behalf of my colleague Mr. Clough and for myself, to answer the question in the affirmative. We cannot