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Notes on Gleichenias

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completely pinnate leaves, the upper leaves, however, a little decurrent on the mid-rib of the compound leaf, or are slightly fused together."

To some extent this has been realised, but the belief of the writer is that no more careful search in the formerly known habitats would have so resulted. It is entirely owing to the discovery of the new habitat in slate rock, and near the sea, in the Uisge Solus, at the mouth of Glen Catacol.

I send leaves of (1st) *the narrow-leaved variety*, gathered from a tree on the west tributary at the head of Easan Biorach (Lochranza Stream); (2nd) *the intermediate variety*, from the tributary stream to the eastern head-water of the Catacol; (3rd) the Pinnate variety, from the Uisge Solus.

I forward, also, the Ordnance Survey map of the north of Arran, on which I have encircled in red the area in which the Rare *Pyrus* has been found.

NOTES ON GLEICHENIAS. By PERCIVAL C. WAITE.

(Read 12th April 1894.)

The following is an abstract of the chief characteristics which I have observed:—

I. In the *Mertensias* the bundle of the petiole, as seen in T.S., is curved into a U shape; in the *Engleichenias* the arms of the bundle unite, so that the cortex embraced by them, together with the portion of bundle-sheath which separates the cortex from the bundle, is nipped off. We have thus an annular bundle surrounded by its bundle-sheath, and containing within it a portion of the outer cortex with a few cells of the bundle-sheath surrounding it. This is the case in the young petiole; later on this inner patch of cortex disappears.

That this peculiar arrangement of the bundle is developed in the way above described may be proved by examining the petiole of the *Engleichenias*, at different levels, as it emerges from the rhizome, where transition stages may be observed. There is first a stage resembling the arrangement in the *Mertensias*, then a little higher up

the approach of the arms cutting through the neck of cortex which joins that inside to the surrounding mass, and, finally, the disappearance of this central portion of cortex and inner ring of bundle-sheath.

II. The bundle-sheath in the petiole and rhizome does not appear as a cortical layer similar to the bundle-sheath (endodermis) of roots, since the cortical cells do not lie opposite the cells of the bundle-sheath, but seem to form part of the bundle itself; it, however, shows the characters of the typical endodermis, with dark dots on the radial walls, and no intercellular spaces. The inner layer of the cortex is not differentiated from the other cortical layers.

III. The layers of cells internal to the bundle-sheath are derived from it by division of its cells, and these divisions begin at a short distance below the apex, but do not form a pericycle.

IV. The spore of the *Mertensias* is reniform; round and marked with a triradiate line in the *Engleichenias*.

I consider that the differences in spores, petiolar bundles, general growth and appearance of the plants, justify the greater distinction formerly made between the *Mertensias* and *Engleichenias*, when they were considered as different genera, and that these characters are sufficient to prevent the two genera being classified as merely sections of one genus.