

the familiar example of *Stangeria* teaches, is as consistent with Cycadaceous or with Filicinean affinities.

When *Medullosa* thus combines, in a striking manner, the characters of Ferns and Cycads, the author is not disposed to regard it as having lain very near the direct line of descent of the latter group. It is more probable, as Count Solms-Laubach has suggested, that the Medulloseae represent a divergent branch, which has left no descendants among existing vegetation.

*Medullosa anglica*, sp. nov.

Stem vertical, clothed by large, spirally arranged, decurrent leaf-bases, perhaps cast off in old stems. External surface of leaf-bases longitudinally striate.

Vascular system of stem consisting of a few (usually three) uniform steles, somewhat elongated and lobed as seen in transverse section. Star-rings absent. Interior of each stele wholly occupied by primary wood.

Secondary wood and bast of moderate thickness, developed on all sides of the steles. Tracheides usually with bordered pits.

Leaf-traces concentric on leaving the steles, branching and becoming collateral in traversing the cortex.

Leaf-bases and petioles with the structure of *Myeloxylon Landriotii*, Ren.

Leaves highly compound.

Gum-canals abundant in the petioles and leaf-bases, and in the cortex, and around the steles of the stem.

Adventitious roots borne in vertical series, triarch, with secondary wood and bast, and periderm.

Stem with leaf-bases, about 7-8 cm. in mean diameter.

Petioles about 2.5-4 cm. in diameter at base, diminishing to about 1 mm. in the ultimate branches of the rachis.

Leaflets about 3 mm. wide.

Roots reaching 12 mm. in diameter.

Locality: Hough Hill Colliery, Stalybridge, Lancashire.

Horizon: Lower Coal-measures.

Found by Messrs. G. Wild and J. Lomax, 1892-98.

**NEW FUCUS HYBRIDS.**—Thuret, in the *Études Phycologiques*, describes his attempts to produce crosses between various members of



the Fucaceae. Hybrids were successfully obtained between *Fucus vesiculosus* ♀ and *F. serratus* ♂, but all the other experiments resulted in failure. The following additional observations may be of interest:—

1. Last November attempts were made by the writer to obtain hybrids between *Ascophyllum* and *F. vesiculosus*. When antherozoids of the latter were added to eggs of the former, no evidence of fertilization was observed: but the reverse cross (*Ascophyllum* ♂ and *F. vesiculosus* ♀) gave a limited number—about one in twenty—of segmenting oospores, while a much larger number became invested with walls. Similar results were given on two other occasions on which the experiment was tried. One of these lots, started Nov. 10, 1898, was allowed to grow, and at the date of writing (Feb. 11, 1899) the plants are quite healthy; they have long rhizoids, most of them are beginning to branch, and several have their first barren conceptacle forming.

2. Antherozoids of *F. serratus* were added to eggs of *Ascophyllum*. About a fourth of the number produced investing walls, a very few showed commencing rhizoids, but only two or three segmented, and even these soon stopped growing.

In view of the recent observations on the fertilization of *Halidrys*, the formation of an investing wall can safely be regarded as evidence of the entry of an antherozoid into the egg. It will be interesting to see whether the absence of segmentation in such an egg is due to the failure of the antherozoid to reach and fuse with the egg-nucleus.

3. Antherozoids of *Halidrys* were added to eggs of *F. vesiculosus*. They gyrated on the surface of the eggs exactly as they do on their own, but in smaller numbers and for shorter periods. Here no evidence of fertilization could be seen.

4. The circumstance which led to this series of experiments was the finding in the Menai Straits of a plant which in external characters seemed intermediate between an *Ascophyllum* and a *Fucus*, while the conceptacles were found to contain both antheridia and oogonia.

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Williams, J. Lloyd. 1899. "New Fucus hybrids." *Annals of botany* 13, 187–188.  
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