NOTE.

NOTE ON THE DURATION OF THE PROTHALLIA OF LASTRAEA FILIX-MAS, PRESL.—I venture to record here some observations on prothallia of *Lastrea Filix-mas*, which seem to indicate a greater vitality and more prolonged duration than have been generally attributed to prothallia.

In August, 1912, I desired to obtain some early stages of fern prothallia for class purposes. To this end, I used a tank with a glass front, and covered the bottom with pieces of coke partly immersed in water. On these were laid some mature fronds of *Lastrea*, and the top covered over with slate slabs. The conditions for germination seem to have been successfully met, and by early October the pieces of coke were covered by myriads of prothallia in all the early stages of development.

These were in due course used for demonstration purposes, and the tank dismantled. I retained, however, two or three pieces of the coke, and placed them in a glass basin with water, and covered the top with a glass plate. The basin was then placed on a shelf in the laboratory and for some time forgotten.

It was not until March, 1914, after an interval of about twenty months from the sowing of the spores, that I remembered about these prothallia, and re-examined them. Fortunately the water had not dried up, thanks to the circumstance that the edge of the basin was ground, and the covering plate fitted fairly closely.

The appearance then presented by the contents of the basin was so remarkable, that at the first glance I supposed that the crop of prothallia had been succeeded by a crop of moss. For in the feeble illumination of the shelf, each prothallium had grown vertically upwards, covering the flanks of the coke lumps as thickly as they could stand, and resembling miniature forests on the sloping surfaces. The average height was about 15 millimetres, and the breadth from 1 millimetre to $1\frac{1}{2}$. From the surface turned away from the light (invariably the morphologically under surface) innumerable rhizoids attached the vertical prothallia like guy-ropes to the surface of the coke, and the edges bristled with the characteristic mucilage cells. While the prothallia were light green through the greater part of their length, the bases were brown through the death of the cells. I could find no fungi, however, on the decadent portion.

On microscopic examination, I could find no trace of archegonia on any of these depauperated prothallia, but the whole of the under surface was studded over with antheridia, to the number of many hundreds on each. Near the apex were immature antheridia, then farther back antheridia which released the antherozoids on access of water, and in the older parts antheridia which had dehisced. I calculated that upon the one prothallium on which I attempted a count, there must have been from 700 to 1,000 antheridia from base to apex.

I now transplanted some of these prothallia, laying them flat with the under surface downwards, on suitable soil in an earthenware saucer, and placed them under a bell-

jar on a window ledge. They gradually established themselves, growing forward quite normally, broadening, and deepening the colour as they grew. By July, young plants began to appear, which showed their second leaf in August. I then made a second transplantation with a similar result.

The original stock in the glass basin was replaced in its old situation on the shelf in order to discover how long the prothallia could retain their vitality under these conditions.

I am now able to state that some of these prothallia have remained alive through the years 1915-16-17 into the current year, that is, for nearly six years from the sowing of the spores. They have gradually languished, however, and many have died off altogether, but even last spring I found young antheridia immediately behind the apices of the surviving prothallia. I was not able to make a successful transplantation from the stock this year, and at the time of writing all the green apices have disappeared.

The points which seem to me from these observations worth record are (1) the narrowing of the prothallus and the assumption of the vertical habit in the feeble illumination, (2) the rigid maintenance of the morphological dorsiventrality in this condition, (3) the recovery of the capacity to produce archegonia on transplantation to more suitable conditions, (4) the great tenacity of life under unfavourable conditions, and (5) the comparative immunity from fungal attack.

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