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Person: Clapham, Abraham (1810 - 1888)
Title: On the viviparous properties of out native ferns
Source reference: Clapham, A. 1855. "On the viviparous properties of out native ferns" *Report of the Scarborough Philosophical and Archaeological Society*, **23**, 53-56.

Transcription date: 14/07/2017
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TRANSCRIPTION

AT A
Meeting held on Thursday the 4th day of Jan., 1855;
R. B. COOKE, Esq.,
HONORARY SECRETARY, IN THE CHAIR.
THERE WAS A FULL ATTENDANCE OF MEMBERS.

After a few introductory observations from the Chairman, Abraham Clapham, Esq., read the following paper-

On the Viviparous Properties of our Native Ferns.

Though my object is to call attention to an unusual mode of reproduction to which several of our native ferns seem to be occasionally liable, it will perhaps not be lost time to take a rapid glance at the ordinary process of fructification. Ferns differ from most other species of plants by being deprived of flowers, and consequently they cannot produce seed. This want is compensated by numerous patches of fructification which usually form at the backs of the fronds, or are produced in cuplike vessels, as with Hymenophyllums and Trichomanes, or throw up branching clusters, as is shewn by Osmunda.

A seed when it vegetates invariably forms its root or radicle from a particular part, whilst the leaves proceed from another distinct portion. A fern spore, on the contrary, whatever position it may occupy on the soil, sends down its roots from the side that is in contact with the earth, whilst the upper part of it throws out the fronds.

About a year ago, a leading article appeared in the 'Gardeners' Chronicle,' purporting to show that hybrid ferns might be raised to a certainty and in any number. The theory was ingenious and plausible, though a very slight amount of reflection raised up so many serious objections, that no practical man could subscribe to it. As the article professed to be based on the result of microscopic observation, I shall give that portion of it that refers to the germination of the fern spore. I quote from memory, therefore cannot use the exact words that are

employed :- 'When a fern seed germinates, it forms a thin plate or scale called a protothal; after a time, small spiral filaments are observed to creep over its surface, when fertilization takes place.' If this theory be verified, which I doubt, it will reveal a most startling feature in botanical physiology, viz., that a fern spore has two distinct lives, the first of which enables it to vegetate and to form a protothal without having been fertilised, afterwards it impregnates itself with its own atherozoids, when its second life commences as young fern.

Before dismissing the subject of reproduction, it is proper to observe, that amongst exotic ferns there are numerous instances of viviparous species; the *Darea Odontites* is a good example, as a fine specimen will carry 50 young plants on a single frond. With some viviparous species the young ferns emit roots whilst on their parent; with others the bulbs fall off, and only take root after remaining for some time on the damp soil. Those ferns that are viviparous usually produce young plants before they have acquired the power to mature spores; and I observe that when the old plants are in a profuse state of fructification their propensity to bear bulbs is considerably diminished.

Monstrous forms of ferns occasionally occur which are devoid of any process of fructification. These varieties seem to be analogous to double flowering plants, in which, by a change called by botanists 'morphology' the generative organs are transformed into extra petals. With ferns when under this influence a considerable increase of frond takes place, as for example, with *scolopendrium vulgare*, var. *crispum*, *polypodium vulgare*, var. *cambricum*, *asplenium trichomanis*, var. *incisum*.

After this long preface I now arrive at my special object, which I commence by observing that in 'Newman's History of British Ferns,' the author asserts at page 120, that a variety of *polystichum angulare* is the only *British species* that produces new plants from *bulbilæ*, or in other words, that is viviparous. From this passage it may be inferred that in January, 1854, *polystichum angulare* was considered to be our only viviparous British fern. That this opinion is erroneous I am about to show; and it may be expected that after experience will detect numerous instances of a similar tendency; in fact, already one-fifth of our known species are determined to be so.

Last spring I noticed that a small knot of wartlike substance was forming on a singular seedling variety of *scolopendrium vulgare*, when, suspecting that it might prove to be a bulb, it received close attention. This formation gradually swelled to the size of a small pea, at the same time dividing so as to show that three fronds were developing themselves; after a time a leaf appeared, which grew to about a quarter of an inch in size, when, as the bulb displayed no inclination to throw out roots, and the frond assumed a yellow tint, the parent frond was pegged down so as to cover the base of the bulb with soil. Under this treatment a healthy colour was soon obtained; roots formed, and a fine frond followed. The young plant was then removed on its parent frond, and was potted off. I now exhibit it, showing the leaf on which the fern formed, also the young frond as it appeared before the bulb touched the soil. On communicating these facts to the gentleman who raised the variety, I received the following reply:-' I went and closely examined my seedling *scolopendrium*s No. 133, and found

about three of them viviparous. A friend of mine has a wild scolopendrium from Ireland, very small, with numerous young ferns on the old leaves.' In a subsequent letter the same party wrote: - 'Your account of scolopendrium No. 133 is most interesting; mine also are becoming more viviparous, but not nearly so large as you describe yours to be.'

The next example to which I have to refer is that of a curious form of scolopendrium, found the last spring by myself. Though this plant is scarcely established, it has borne fronds of four distinct characters, on one of a bireneform outline. Just at the junction with the stipes a young plant is appearing, which, though very small, distinctly shows that fronds are forming. I may here observe, that in both these scolopendriums, and also in a third instance, to which it is needless further to refer, the bulbs have grown on fronds of apparently arrested growth.

I now exhibit a young plant of a monstrous form of that elegant fern the filix mas, var. cristata; a bulb has appeared at the base of one of the stipes, and a second seems to be declaring itself.

The viviparous properties of my ferns were pointed out to Mr. Baxter, the curator of the Oxford Botanical Gardens, who, on his return home, favoured me as follows:- 'When with Mr. Baines of York, you drew our attention to viviparous forms of scolopendrium vulgaris and polystichum angulare; and believing that it may interest you, I herewith submit to you similar forms which I have observed in two certainly, and with scarcely a doubt, three species of ferns that I am not aware have previously been detected in that state. The plants are in my care, and are polystichium lobatum. On this plant were two viviparous buds, one on an entire frond, the other at the base of an old frond, but still attached to the plant; the latter I send herewith, as well as a solitary instance from lastræa fonesecü, formed also at the base of an old frond, but whether produced before or after the removal of the upper portion of the frond, I don't know. From these, plants may be raised; but with the third kind, asplenium lanceolatum, there is scarcely a chance, the frond having unluckily been broken, and I fear the bud has perished, still I send it to you; it is the only bud this plant has produced, but I think one or two other fronds appear disposed to bear them.

In conclusion, I beg to observe that Mr. Wollaston, of Chiselhurst, who has probably the finest collection of British ferns in the kingdom, kindly favoured me with a communication on the 29th of last month, in which he states that polystichum lonchitis, polystichum aculeatum, polystichum angulare (three or four forms), scolopendrium vulgaris (many forms), blechnum spicant, lastræa fonesecü, lastræa felix mas (two forms), asplenium lanceolatum, amesium ruta muraria are viviparous, which, with polystichum lobatum, make ten British species, being nine more than were recognised by Newman just twelve months ago."