formed in the usual way, is early lost, and the embryo grows to a relatively large size before the organs make their appearance. The root and shoot originate from the upper part of the embryo; and it may perhaps be inferred that, like those of *Isoetes echinospora*, they are derived from the upper octants. The foot is formed from the whole of the lower region of the embryo. The cotyledon is apparently derived secondarily from the shoot meristem.

(8). The root, the stem, and the cotyledon grow by the segmentation of a single apical cell, as in the adult plant. The root develops more rapidly than the other organs; and the second or third root may make its appearance before the cotyledon unfolds. The latter is green and capable of assimilation, as in *Ophioglossum pedunculosum*.

(9). The root-system of the young sporophyte is soon occupied by a symbiotic fungus, which differs in the size of its filaments and in several other respects, from that found in the gametophyte.

(10). Evidence of apogamy has been found in the form of prothallial tracheides.

(11). One example of polyembryony was observed.

(12). The sporophyte remains for a long time attached to the gametophyte. It is an open question whether this is a primitive characteristic, or merely an adaptation. The fact that the young sporophyte of the much less robust *B. Lunaria*, according to Hofmeister's account remains for a very short period attached to its gametophyte, would seem to justify the latter assumption.

IX.

In coming to any conclusions as to the bearing of this research on the phylogenetic position of the *Ophioglossaceæ*, due weight should be given to the fact that the present species is the only one which has been somewhat fully investigated; and the results of recent observations on the *Marattiaceæ*, *Lycopodiaceæ*, and *Equisetaceæ* show that a very considerable variety of development may exist even within the same natural group. Moreover the saprophytic habit of the gametophyte of *B. virginianum* has in all probability more or less profoundly modified its structure.

It will be convenient to consider first the position of *B. virginianum* in regard to the other representatives of the *Ophioglossaceæ* which have been studied. Its prothallus resembles very closely that of *B. Lunaria*, and shows indications of being only a more specialized type. That this