

of the *Ophioglossaceae* has long been known, and is mentioned by Russow and Holle in the works already cited. The latter refers to its presence or absence, the varying number of protoxylem groups in the larger and smaller roots of *Botrychium matricariaefolium*. In *B. virginianum* this explanation cannot be accepted, as, although the first formed roots vary greatly in the number of archixyles, it is only in rare cases like that figured in 68 that the fungus is present.

VIII.

The results of this investigation may be summarized as follows :—

(1). The gametophyte of *B. virginianum* is entirely subterranean, without chlorophyll and probably symbiotic. It is from two to twenty millimetres in length by one and a-half to fifteen millimetres in breadth, and oval in outline, whether viewed from above or from the side.

(2). The whole surface of the plant is beset with rhizoids, which are generally multicellular. The upper part of the gametophyte is occupied in most prothallia, which have not yet produced embryos, by a median ridge. The reproductive organs are found exclusively on the superior surface, the *antheridia* being situated on the crest of the ridge, and the *archegonia* on its flanks.

(3). The gametophyte grows by a well-marked apical meristem which is situated on the upper side, anteriorly, and apparently originates from a single initial cell.

(4). There is present in the lower part of the prothallus, an endophytic fungus, possessing characteristics which will perhaps, on further study, justify its recognition as a form intermediate between the genera *Pythium* and *Completozia*. The symbiont is accompanied by a large amount of oil, and probably advantageously affects the nutrition of the prothallus. The fungus dies after one or more embryos have reached a considerable size.

(5). The *antheridium* originates from a single superficial cell and is characterized by possessing a double outer wall. The antherozoids are of the ordinary filicineous type and are rather large in size.

(6). The *archegonium* likewise takes its origin from a single superficial cell. The neck consists of seven or eight tiers of cells. The cervical canal-cell is binucleate, but is never represented by two cells. A stratum of basal cells is present.

(7). The first division of the fertilized egg is transverse, as in the other eusporangiate Pteridophyta. The identity of the octant walls which are