

This article was downloaded by: [University of Cambridge]
On: 15 January 2015, At: 13:22
Publisher: Taylor & Francis
Informa Ltd Registered in England and Wales Registered Number:
1072954 Registered office: Mortimer House, 37-41 Mortimer Street,
London W1T 3JH, UK



Transactions of the Botanical Society of Edinburgh

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/tped18>

On The Prothallus Of *Lepidodendron Veltheimianum*

WM. T. Gordon M.A. B.Sc. ^a

^a Edinburgh University

Published online: 29 Nov 2010.

To cite this article: WM. T. Gordon M.A. B.Sc. (1908) On The Prothallus Of *Lepidodendron Veltheimianum*, Transactions of the Botanical Society of Edinburgh, 23:1-4, 330-332, DOI: [10.1080/03746600809469177](https://doi.org/10.1080/03746600809469177)

To link to this article: <http://dx.doi.org/10.1080/03746600809469177>

PLEASE SCROLL DOWN FOR ARTICLE

Taylor & Francis makes every effort to ensure the accuracy of all the information (the "Content") contained in the publications on our platform. However, Taylor & Francis, our agents, and our licensors make no representations or warranties whatsoever as to the accuracy, completeness, or suitability for any purpose of the Content. Any opinions and views expressed in this publication are the opinions and views of the authors, and are not the views of or endorsed by Taylor & Francis. The accuracy of the Content should not be relied upon and should be independently verified with primary sources of information. Taylor and Francis shall not be liable for any losses, actions, claims, proceedings, demands, costs, expenses, damages, and other liabilities whatsoever or howsoever caused arising directly or indirectly in connection with, in relation to or arising out of the use of the Content.

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden. Terms & Conditions of access and use can be found at <http://www.tandfonline.com/page/terms-and-conditions>

HEPATICÆ.

Jungermannia quinquedentata, Huds.—Some shoots intermingled with *Dicranum grœnlandicum*.

Jungermannia Flœrkei, Web. et Mohr.—Occurs sparingly in a tuft of the following species.

Jungermannia minuta, Crantz.—Common: in compact hard tufts, with a profusion of perianths.

Blepharostoma trichophyllum (L.), Dum.—Occurs sparingly in company with the last species.

ON THE PROTHALLUS OF LEPIDODENDRON VELTHEIMIANUM.
By WM. T. GORDON, M.A., B.Sc. (*Carnegie Research Scholar in Geology, Edinburgh University*). Communicated by the Secretary. (Plate VII.)

In the Carboniferous Epoch the lycopod alliance formed one of the dominant groups of plants, and contained not merely small forms with a habit similar to the modern representatives of the group, but also large arborescent forms. With such great differences in the vegetative parts we should expect corresponding differences in the reproductive strobili which these plants produced. In *Lepidocarpon*, *Miadesmia* and *Spencerites* we see such specialisation in a marked degree, the seed-like form of the first two showing adaptation to drier conditions than lycopods now grow in. Others show a closer approach to *Selaginella* in the organisation of their strobili, though they are still far removed from that genus. In general the sexual processes are the last to be altered by changing conditions, so the gametophyte stage ought to show affinities with modern forms rather than the sporophyte stage. Unfortunately few gametophytes are ever obtained, and so this method of discussing affinities is limited. When, however, the prothallus develops within a spore wall, either permanently or until fertilisation takes place, there is a better chance for its preservation, and in *Lepidodendron Veltheimianum* we get an example of such preservation.

In the Burntisland limestone blocks, strobili of a lycopodiaceous nature occur in fair abundance, but so far none

have been met with in actual tissue connection with stems. Professor Williamson referred these strobili to the *Lepidodendron* common in the same blocks (viz. *Lepidodendron Veltheimianum*) on the ground of their association (Williamson, 1872). Messrs. Kidston and Binnie, after research on megaspores occurring in the Carboniferous strata, have come to the same conclusion. The probabilities are, then, that these strobili were the fructifications of *Lepidodendron Veltheimianum*, and as this prothallus is in a megaspore identical with those occurring in the heterosporous strobili mentioned above, I have referred it to that species. The strobili bear microsporangia in the apical part and megasporangia towards the base. The megaspores have a thick reddish-brown coat covered by knobbed spines, while three ear-like lobes of the spore wall can be seen at the apex of the spore. In the specimen figured there are two of the processes referred to, and at these two places the wall shows a certain amount of splitting, so that the protuberances are at least partly due to rupturing of the spore coat to expose the archegonia. Most of these megaspores (which occur in great abundance throughout the blocks) have no tissue inside them, and, when we consider how delicate prothalloid tissue is, this is not surprising. Sometimes, however, they are filled with scattered or broken-up cells, and occasionally with a continuous cellular tissue. In the last case it is justifiable to consider it as a prothallus.

In the specimen figured the plane of section is almost radial longitudinal. It passes through the area enclosed by the three lobes, and which is presumably the apex of the megaspore, and there we should expect to see archegonia if they were present. While I cannot definitely say this is the case, there is at least a cap of small-celled tissue comparable with the archegonial tissue of *Selaginella*. Probably the specimen was not quite mature, for there is no distinct gap in the spore wall at the ear-like lobes, and this immaturity may explain the absence of archegonia. The rest of the prothalloid tissue is of larger-celled parenchyma, the line of demarcation being quite distinct though not constituting a diaphragm. This small-celled archegonial tissue at the apex of a larger-celled prothallus is essentially similar in *Selaginella*, while the splitting of the spore coat along three

directions is also shown in that genus. Hence the occurrence of similar tissue in similar position in the megaspore of *Lepidodendron Veltheimianum* leads to the conclusion that the prothallus in that species was similar to that in *Selaginella*. As other Carboniferous *Lepidodendra* had probably a similar development, we may safely say that the gametophyte generation in some *Lepidodendra* was similar to that of *Selaginella*.

EXPLANATION OF PLATE VII.

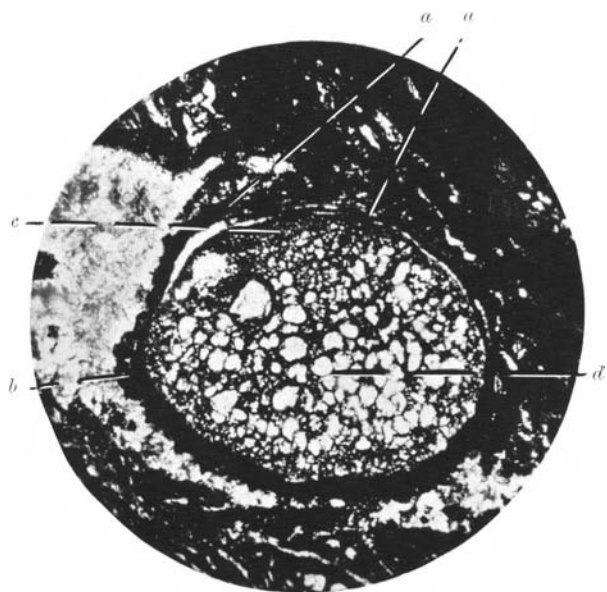
Figure of megaspore containing prothallus. $\times 48$. Gordon collection, No. 158. *a*, *a*, ear-like lobes of spore wall; *b*, cluster of knobbed spines all curled up together; *c*, small-celled archegonial tissue; *d*, large-celled prothalloid tissue on the apex of which *c* is situated.

Dr. A. W. BORTHWICK showed some Disease-causing Micro-fungi.

Dr. R. STEWART MACDOUGALL showed a section of oak with galleries of *Cossus ligniperda*.

Mr. J. MORRISON, M.A., exhibited the fruit of *Cariniana pyriformis*.

Mr. R. L. HARROW showed the following plants in flower from the Royal Botanic Garden:—*Amasonia calycina*, *Bryophyllum crenatum*, *Caladenia carnea*, var. *alba*, *Corylopsis pauciflora*, *Crassula hemisphærica*, *Dendrobium Cordelia rosea*, *Gomesia foliosa*, *Hakea acicularis*, *Hamamelis arborea*, *H. japonica*, var. *Zuccariniana*, *Iris alata*, *Lindenbergia grandiflora*, *Odontoglossum maculatum*, *Primula* \times *digenea*, *P. Palinuri*.



Megaspore of *Lepidodendron Veltheimianum*.