destruction during the palmy days when the Aigoual was a shining mass of mica schist, and its present insignificant attempts, is instructive.

But the aims of L' Hort de Dieu are wider yet. There is an experimental kitchen garden, and a series of plots designed for the culture of ornamental plants. And finally there is a series of pastures ranging from the original stony wilderness, through plots from which the stones have been removed, irrigated plots, plots manured by grazing animals, to plots scientifically treated with artificial manures. The vegetable garden, the ornamental plots and the experimental pastures are primarily designed to show a very ignorant highland population what can be done with the means at its disposal.

One who has enjoyed, as has the present writer, a month's hospitality in this veritable garden of the gods, must find it difficult to refrain from launching into a panegyric of all which its name calls up in his mind. But no praise could seem otherwise than cold to the writer and fulsome to the reader. It may be added however that the opportunities for work are as varied and abundant as the life is simple and refreshing.

The above description is all too inadequate, but may serve to bring to the notice of our British botanists, a garden which is not only a model of what such a garden ought to be, but also a striking example of the results attainable without great means, but with the qualities exemplified by Darwin's motto—It's dogged does it: and of a most admirable catholicity of aim and ideals.

NOTE ON AN ARTIFACT IN THE WALLS OF THE CELLS OF THE MEDULLA IN THE LAMINARIACEÆ.

By M. G. THODAY (formerly SYKES).

[TEXT-FIGS. 13 AND 14].

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IT was recently pointed out to me by Miss E. R. Saunders, that in a section of *Laminaria digitata* in the collection at the Balfour Laboratory, Cambridge, the elements of the medulla showed a most characteristic *reticulate thickening* on their longitudinal walls.

This reticulate thickening (see Figs. 13 and 14) was well developed in the walls of both the primary pith filaments¹ and the hyphæ, but was not present in the much thinner walls of the secondary sieve tubes.¹ The "thickenings" extended even into

¹ For use of terms see Sykes, M. G., "Anatomy and Histology of *Macrocystis pyrifera* and *Laminaria saccharina*"; Ann. of Bot., XXII., 1908, pp. 309, 310 and 300-303.

the dilated parts of the elements almost up to the transverse wall or sieve plate.

Fig. 13.

Fig. 14.

Fig. 13. *L. digitata*; three of the longitudinally running element of the medulla. (Preserved in strong alcohol).

Fig. 14. *L. digitata*; part of a transverse section showing some of the invading cortical hyphæ. (Preserved in Carnoy's fluid).

Similar appearances have been noted from time to time in material examined at the Cambridge Botany School, and it seemed advisable to try to arrive at an understanding of their nature. The material from which Miss Saunders' slide had been prepared was preserved in strong alcohol. Material of an old stipe of *L. digitata* preserved in Carnoy's fluid was also examined, and showed the "thickenings" equally strikingly developed. Faint indications of similar "thickenings" were found in the stipe of a young sporeling of *L. saccharina* preserved in 70% alcohol,¹ where the walls of the medulla cells are as yet comparatively slightly mucilaginous and swollen.² The "thickenings" always stain in the same way as the rest of the inner layers of the cell-wall; deep blue with methylene blue, faintly with Congo red, etc.³

It was found that the demonstration of these "thickenings" depended entirely on the methods followed in preserving, staining, mounting, etc. An old stipe of *L. digitata* in sea-water was kindly sent to me by Professor Yapp, and was examined while still fresh; no such appearances were then present in the cell-walls. They could, however, be produced by drying, or by partially dehydrating the sections in alcohol. Material of *L. digitata*, *L. saccharina* and *Macrocystis* preserved by killing and fixing entirely in aqueous solutions, without the use of alcohol, showed little or no trace of these "thickenings"; in sections obtained from the material pre-

¹ Ibid, p. 309, Stage 1.

² Oltmanns. "Morphologie und Biologie der Algen," Jena, 1904, I., p. 446.

³ Sykes, M. G., l.c., p. 312.

served in Carnoy's fluid the "thickenings" were made to disappear by placing in swelling agents, such as iodine dissolved in an aqueous solution of potassium iodide, or dilute glycerine, owing to the absorption of water by the mucilaginous walls.

The very definite appearance of reticulate thickenings in material preserved in alcohol is thus apparently entirely due to *wrinkling* consequent on partial dehydration, and since it begins to appear after very slight drying it affords a remarkable indication of the very mucilaginous nature of the longitudinal walls of the medulla cells in their normal state. At the base of the stipe, where all the cell-walls of both cortex and medulla become much thickened and cartilaginous, this wrinkling does not occur on drying.

NOTES ON RECENT LITERATURE.

GRAF SOLMS LAUBACH ON THE PETIOLES ATTRIBUTED TO *Cladoxylon* AND *Medullosa (Steloxylon) Ludwigi*."

IN April, 1909, attention was drawn in these pages to M. Paul Bertrand's conclusion that the Botryopteridean petiole *Clepsydropsis* was borne on stems known as *Cladoxylon* and *Steloxylon (Medullosa) Ludwigi*. In the following year Graf Solms Laubach denied that *Clepsydropsis* was the petiole of either of these stems.¹ This writer points out that he had previously described a petiole still attached to a *Cladoxylon* stem, and that this petiole differs markedly from *Clepsydropsis*. The vascular bundle of this *Cladoxylon* petiole forms a band, narrowed in the middle and transverse to the axis; this band has on one side two projections and appears to contain four protoxylem groups, two more or less in the basal part of the projections and two immersed in the wood near to the ends of the band. In the petiole known as *Clepsydropsis*, however, the two projections are wanting and there are but two protoxylems in the loop-like gap in the swollen ends of the vascular band that forms the petiolar strand. It is fair to add that Graf Solms Laubach admits that the position of the protoxylem is not quite clear in the petiole described by him. Moreover it is unfortunate for comparison with the Botryopterideæ that neither in his present communication nor in the earlier paper to which he refers is it quite clear whether the two projections of his two *Cladoxylon* petiole face adaxially or abaxially.

As regards the attribution by M. P. Bertrand of *Clepsydropsis kirgisica* to *Medullosa (Steloxylon) Ludwigi*, the petioles of this species figured by Graf Solms Laubach are remarkable for the extraordinary, almost unparalleled, variety of their vascular bundles in cross section. They certainly do not resemble *Clepsydropsis*. The species is regarded as belonging to the *Medullosæ*, but not to the genus *Medullosa*.

I.B.

¹ Zeitschrift für Botanik, Heft 8, Jahrgang, 2, 1910.

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