daughter-plant was found to have its cells (especially those near the point of budding) completely filled with large starch grains (nearly twice the size of those normally present in the leaf-cells). Very few of the latter were, however, present in leaves bearing daughter-plants in late stages of development.

Sooner or later the leaves of the parent become detached, by the decay of their petioles, and the new individuals become established as independent plants.

Although the vegetative reproduction described has not been observed by the writer in nature, this is probably because the localities have been visited too infrequently and at unfavourable times of the year. The accumulation of starch and the detachment of the budding leaves certainly seem to suggest a definite reproductive mechanism.

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EAST LONDON COLLEGE,
January, 1915.

ANATOMY OF THE MAGNOLIACEAE.—During recent years the problem of the origin of the Angiosperms has attracted a good deal of attention, and views, more or less divergent, have been expressed by Lotsy, Lignier, Benson, Hallier, Senn, Newell Arber and Parkin, and others. Recent theories agree in regarding the Dicotyledons as the more primitive, but there is a want of unanimity as to the point, or points, of origin of the Monocotyledons from what is presumed to be the more ancient stock. Many hold that the Magnoliaceae are to be regarded as the most primitive of the Dicotyledons, on the ground of the resemblance between their flowers and the anthostrobilus of such types as Bennettites. If that be the case it may be anticipated that the anatomy both of the seedling and of the mature plant will give support to the theory. Beyond a few isolated observations on some species, however, tending to show the general occurrence of secretory cells, wood fibres with bordered pits, a tendency to the formation of true vessels by scalariform perforations, and a general absence of glandular hairs, there is, so far as I am aware, a lack of any detailed comparative investigation of the anatomy of the various genera included under the order.

For some time past I have been collecting material of the Magnoliaceae and through the kindness of friends in various parts of the world I have been successful in obtaining eight out of the nine recognized genera, but as yet I have not been able to acquire specimens of *Zygogynum*. I would esteem it a favour if any one having access to this New Caledonian form would be so kind as to send me specimens. During the past winter I have investigated the adult anatomy of *Drimys Winteri* and endeavoured, though unsuccessfully, to raise seedlings from seeds supplied through the courtesy of several correspondents.

The literature on the subject is not very extensive, and beyond the papers recorded by Solereder (Syst. Anat. Dicot.), few investigations have been published on the subject. Strasburger, working on *Drimys*, draws attention to the gymnospermic character of the xylem coupled with the angiospermic mode of development of the megaspore, and Maneval has also studied the embryonic structure in *Magnolia* and *Liriodendron* (Bot. Gaz., vol. lvii). Paul Parmentier (Bull. Scient. de la France et

de la Belgique, t. xxvii, 1895) claims to have seen true vessels in two species of *Drimys*, viz. *D. Mülleri* and *D. vascularis*, but it may be questioned whether these forms ought to be included under the genus.

An examination of the anatomical structure of *Drimys Winteri* and *Drimys odorata* has established the following points:—

1. Vessels (tracheae) are absent.
2. Bordered pits with X-like apertures similar to those in *Cycas* and some Conifers are present.
3. No longitudinal parenchymatous strands occur in the wood.
4. The sieve-tubes have bevelled ends, bearing several plates like those found among Pteridophyta, and appear to be accompanied by companion cells.
5. A broad transitional region exists in the wood of young twigs, from the spirally thickened protoxylem elements to the tracheides with bordered pits of the mature wood.
6. Resin, or a secretion of a resinous nature, occurs in large quantities in the parenchyma, and drains into resin 'ducts' which are of the nature of simple intercellular spaces.
7. The medullary ray cells are pitted and elongated in a vertical direction, and in a tangential section the rays are multiseriate in the middle, becoming uniseriate above and below.

These anatomical points, among others, recall pteridospermic and gymnospermic peculiarities of structure. Thus the bevelled-ended sieve-tubes with lateral plates and the absence of vessels are characteristic of Ferns and their allies. The bordered pits agree in structure with those of most Conifers and Cycads, although it should be remembered that *Marsilia* also possesses tracheides with similar bordered pits. The absence of longitudinal strands of parenchyma in the mature wood may be a primitive or a reduced character, but this point can be decided only by comparison with other genera.

This preliminary note is intended only to indicate the general lines on which the present investigation is being carried out, with the hope that Systematists interested in this branch of phylogeny may be induced to aid me either by sending material or by gift of 'separata' of their writings on the subject.

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CORRECTION.

- A. S. MARSH: The Anatomy of some Xerophilous Species of Cheilanthes and Pellaea, vol. xxviii, 1914, p. 627.
lines 5 and 7, for Santa Catalina, California, read Santa Catalina Mountains, Arizona.
line 6, for California, read Colorado.

Knight, Margery. 1915. "Anatomy of the Magnoliaceae." *Annals of botany* 29, 310–311. <https://doi.org/10.1093/oxfordjournals.aob.a089550>.

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