cause such a rush of air by the railway side where they grow. Seeds of plants which showed about a third of *L. vulgaris* and two-thirds of *L. repens* parentage when sown in light garden soil, yielded plants still nearer to *L. repens*; probably they were the result of crossing with the pollen of *L. repens*. Seeds of the second generation, however, yielded plants nearer to *L. vulgaris*; that is, they were about the same as the hybrid from which the first seeds had been collected. In this case pollen of *L. vulgaris* had been kept from them.

At Didcot the same series of hybrids has been noticed, but they occur in much smaller quantity.

G. CLARIDGE DRUCE.

Aug. 14.

THE ARRANGEMENT OF THE VASCULAR BUNDLES IN CERTAIN NYMPHAEACEAE¹.—One of the most remarkable characteristics of this order is the very extensive prevalence of the astelic system in the arrangement of the vascular bundles of their stems; however, during an examination into the structure of various members of the order, the fact that other systems of arrangement also are present came to light. Thus in *Nymphaea flava* and *N. tuberosa* the plants produce small tubers at the ends of stalks or stolons of greater or less length, and in these stalks or stolons the vascular bundles are not arranged in an astelic manner, but are grouped around three to five different centres, forming thus so many separate steles, or at least so many groups possessing all the characteristics of definite steles. Each of these is surrounded by its own endodermis, and is composed of three to four vascular bundles with very distinct and prominent phloems, while a small canal in the centre of the stele represents their disintegrated xylems.

The tubers formed at the end of these stolons bear buds which grow out into fresh rhizomes, the first internodes of which are very narrow and much elongated; in these, again, the vascular bundles (four to seven in number) exhibit a different arrangement, for they present none of the confusion found in the mature rhizome, but run perfectly longitudinally; either they all keep separate, or a varying number of them may be united to form pairs. When six of them are present and these are arranged in three pairs, the section presents

¹ Abstract of a paper read before Section K at the Liverpool Meeting of the British Association, 1896: see also *Annals of Botany*, Vol. x, p. 289.

a remarkable resemblance to that of the floral peduncle of *Cabomba aquatica*.

Again, in the rhizome itself the arrangement is not altogether astelic, for by the aggregation of the separated bundles of the stem a number of steles are formed, one in the region below the point of insertion of each leaf. These groups of bundles appear to be set apart for the especial purpose of bearing the adventitious roots, and they are to be found in varying degrees of perfection throughout the order. I found *Victoria regia* and certain species of *Nymphaea* to possess the most perfect root-bearing steles; they are composed of ten to twenty bundles arranged in a ring, and are perfectly distinct and well defined. On the other hand, in other species of *Nymphaea* and in *Nuphar*, the bundles set apart for bearing the adventitious roots are not arranged in a sufficiently regular manner to be considered as a stele, or are only laterally fused together to form an arc of greater or less extent.

D. T. GWYNNE-VAUGHAN.

CHANGES IN THE TENTACLE OF DROSERA ROTUNDIFOLIA, PRODUCED BY FEEDING WITH EGG-ALBUMEN¹.

—In unfed leaves fixed in watery picro-corrosive (sp. gr. 1.020) and stained with eosin-toluidin blue, the apical and lateral glands of the first or outer layer and also all the cells of the second or middle layer show a deep-blue cytoplasm, with nuclei possessing little chromatin proper, but large nucleoli and a granular nucleoplasm. Within one minute after feeding the blue cytoplasm becomes purple; after one hour it is greatly vacuolated and reddish purple; after twenty-four hours the blue material has disappeared, and only a few strands of a pink cytoplasm are to be seen. The nucleus after feeding loses the granular cytoplasm, the nuclear chromatin segments enlarge enormously, reminding one of the early stages of mitosis. The nucleolus has lost its red chromatin, and is not easy to see.

Recuperation of the cytoplasm is the result of nuclear activity, for the chromosomes enlarge during the period preceding the appearance of the granular nucleoplasm, which latter in every respect resembles the granular deposit of cytoplasm in immediate contact with the outer surface of the nuclear membrane. The cytoplasm is at first

¹ Abstract of a paper read before Section K at the Liverpool meeting of the British Association, 1896. For full account see Quarterly Journal of Microscopical Science, October, 1896.

Gwynne-Vaughan, D. T. 1896. "The arrangement of the vascular bundles in certain Nymphaeaceae." *Annals of botany* 10, 624–625.

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