the commercial article, as it is not so apt to corrode the steel pen. The present note is written with it, and has no admixture whatever, being only yesterday expressed from the fruit. When newly written, its colour is reddish, becoming black after a few hours."

A Description of some remarkable Malformations affecting the Genus *Lolium*. By MAXWELL T. MASTERS, M.D., F.L.S., Lecturer on Botany, St. George's Hospital.

[Read March 19, 1863.]

IN the volume of the Bull. Soc. Bot. Fr. for the year 1858, p. 85, M. Fournier has described four varieties of *Lolium perenne* as of common occurrence, and in a paper in Seemann's Journal of Botany, vol. i. p. 6, I have mentioned certain others. The specimens I have now the honour of laying before the Society must be classed under the head of Deformities rather than that of Varieties.

The simplest of the changes now to be mentioned consists merely in the lengthening of the axis of the spikelet, in consequence of which, the constituent florets are separated by much longer intervals than usual. In some examples of this, the axis is not merely lengthened, but becomes very flexuose, while the outermost glume only just exceeds the lowermost floret in length, and is very short in proportion to the length of the spikelet; hence the aspect of the plant is very different from that of the natural form. This change may occur independently of any other; but I have most frequently met with it in the branched variety, common under the several names of *L. perenne compositum*, *paniculatum*, or *ramosum*. Usually only a few of the spikelets are so affected; but in the plant now shown all the spikelets are thus changed.

In another series of specimens I have met with the following changes:—The spikelets have assumed more of a rounded outline than usual, and are shorter than the outer glume. The number of florets is in general reduced to three, in each of which, or sometimes in the lower one only, considerable changes have taken place. The paleæ are for the most part unchanged; but in some of the spikelets the inner palca is placed opposite to the outer one, and on the same level with it, while in others the inner palca is split into two, thus rendering the symmetry of the whorl complete (fig. 1, *a*). Within the paleæ, in place of the stamens and pistils is a confused mass, consisting of numerous scales, the outermost of which resemble paleæ, and are frequently more

or less recurved or hooklike at their points; the inner ones are smaller, and either merely white and membranous like the ordinary lodicles, or they exhibit various intermediate stages between the state of scales and that of feathery stigmata (fig. 1, *b*, *c*). I have not been enabled to discover, in any of the very numerous specimens examined, the slightest trace either of stamens or of ovules.

Fig. 1.

a. Floret showing outer palea partially stigmatic; inner palea partly divided into two, and enclosing a number of scales. *b*, *c*. Inner scales from florets, showing tendency to assume appearance of the pistil.

To sum up the peculiarities afforded by these specimens, it may be said that they present a diminished number of florets, an alteration in the form of the spikelet, a change in the number and disposition of the paleæ, a partial chloranthic condition of the inner constituents of the florets, a multiplication of these constituents, and a tendency in them to assume the nature of the pistil.

In a third series of specimens the changes that have taken place are yet more grave and singular. In the lower part of the spike the spikelets are of the ordinary form, and are arranged singly and alternately on the sides of the grooved rachis; but towards the upper part of the spike a change in the disposition takes place, and the spikelets become arranged in pairs on each notch of the rachis, as they are in *Elymus* or *Hordeum*, the pairs being arranged alternately as usual, but in four or more rows instead of in two.

The spikelets themselves are more or less spherical in form, each has an outer and inner glume of the ordinary aspect, and is made up of a number of florets arranged, not in two rows, but in several, and, owing to the shortening of the rachis of the spikelet, they are densely tufted. So closely are the florets crowded, that in many instances a fusion of the outer paleæ of two contiguous florets has taken place. This double palea shows eleven ribs, five on each half, and a central one in the line of fusion.

The union sometimes extends also to the inner paleæ; and in one case the inner pales of three florets were united together. Within the paleæ may here and there be found a perfect flower; but more usually there are a number of scales, the outer ones palea-like, often twisted spirally, and hooked at the summit; the succeeding ones exhibit various intermediate conditions between that of palea and that of stamens, while the central ones are merely rudimentary scales. The lodicules are not distinguishable from these latter; and, contrary to what happens in the second series of specimens now described, in the present instance there is no trace of pistil, except in the case immediately to be described. In addition to the changes just mentioned, the axis of the spikelet just within the outer glumes occasionally divides into two diverging branches, each bearing its tuft of florets (fig. 2). In the fork between the two branches is placed in some,

Fig. 2.

Branching of axis of spikelet within the outer glumes.

but not in all, a single floret, which thus terminates the main axis of the spikelet, after the fashion followed in a dichotomous cyme. The component parts of this floret are arranged after a different method from the ordinary one (fig. 2 *a*). The outer whorl consists

Fig. 2 *a*.

Central, terminal floret, and plan of the same.

of two paleæ, placed directly opposite one another, and quite resembling in form and appearance the ordinary outer palea. Within these, and at right angles to them, are two more segments, precisely resembling the inner paleæ of the natural flower; within these, again, are a number of thin membranous scales, some of them having more or less of the appearance of the stigmata.

Thus in these very curious specimens the following changes, or some of them, may be observed:—

1st. An alteration in the form of the spikelets, whereby they become spheroidal.

2ndly. Their arrangement in pairs instead of singly on each notch of the rachis, and also in more than two vertical rows.

3rdly. The disposition of the florets in close tufts or whorls; in consequence of which, 4thly, the outer and inner paleæ become more or less fused together.

5thly. Multiplication of the inner portions of these florets, and their presence in the form of scales, exhibiting transitional stages between the scales and stamens.

6thly. Bifurcation of the axis of the spikelet; and, 7thly, the occasional presence of a floret of peculiar construction in the angle of divergence of the two branches.

Account of the Botanical Collections made by DAVID LYALL, M.D., R.N., F.L.S., Surgeon and Naturalist to the North American Boundary Commission.

[Read June 18, 1863.]

THE plants upon which the following observations were made, and of which a complete systematic catalogue is appended, were collected in the years 1858–1861, during which period I was, firstly, Surgeon of H.M. Surveying-ship ‘Plumper,’ and afterwards Surgeon and Naturalist to the Commission appointed to mark out the boundary-line between the British Possessions and those of the United States of America, to the westward of the Rocky Mountains.

The dried plants were transmitted from time to time, as collected and preserved, to Sir William Hooker, at the Royal Gardens at Kew. Of these, the earlier collections were provisionally arranged and catalogued soon after their arrival by Mr. Black, the Curator of the Herbarium; my later and more extensive collections, to-