passage, six or seven yards, and, with a favouring wind, often much further. The seeds in their flight through the air, though dry and ripe, do not fall to the ground; they are held in their upright position by the grooved process until the apex of the capsule, overbalanced by its weight, turns in falling, giving the seeds, which are thus cleverly carried to their destination, a free passage to fall to the earth, at some distance away from their parent plant, where, without incommoding it, there may be sufficient room for the future generations of *D. adhatodoides* to spring up and fulfil their destiny.

Highlands, Graham's Town, S. Africa.
Nov. 12, 1867.

On the Modification of the Stamens in a Species of *Begonia*.

By Fritz Müller (in a Letter to Mr. Darwin).

[Read June 3, 1869.]

Itajanez, S. Catharina, Brazil.
March 14, 1869.

My dear Sir,

In your book on 'Variation under Domestication' you mention a remarkable plant of *Begonia frigida* producing hermaphrodite flowers with inferior perianth. I have lately found an analogous wild plant of another *Begonia*, which is here a common weed. In this plant all the male flowers show a strong tendency to become hermaphrodite—one, two, or three of the central stamens being transformed more or less completely into pistils. No two of these male flowers appear to be exactly alike; and almost every day affords a new and surprising modification. Here are some cases:—

Fig. 1.

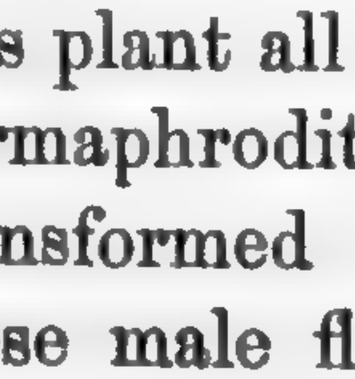

Fig. 2.

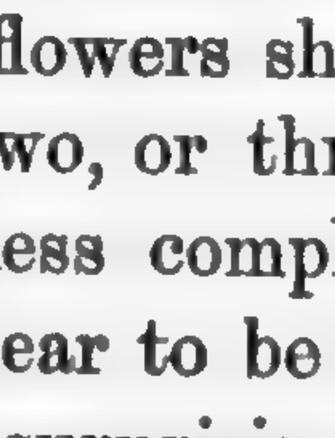

Fig. 3.

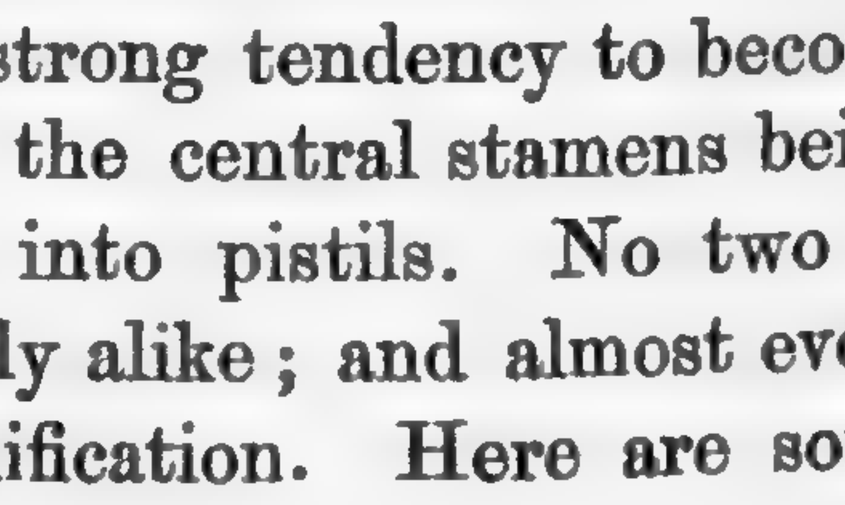

Fig. 4.

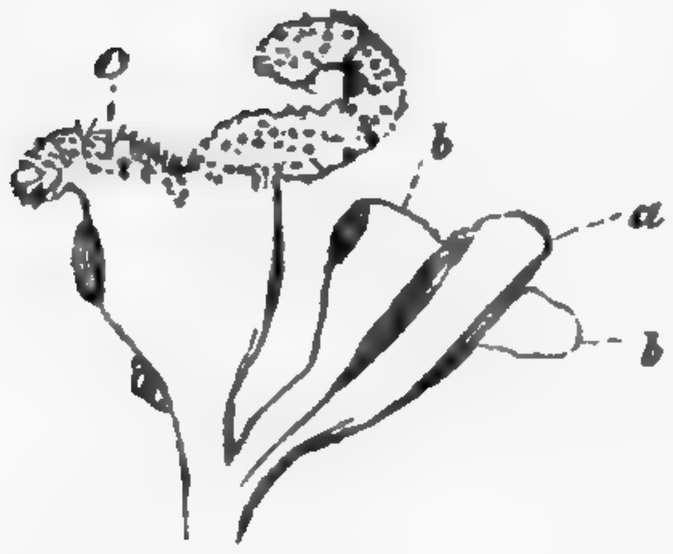

Fig. 5.

Fig. 1. A single stamen modified; connectivum much dilated; on either margin a short anther with good pollen; at the end, well-developed stigmatic papillæ.

Fig. 2. A single stamen modified; a well-developed stigma; neither anthers nor ovules.

Fig. 3. Three modified stamens, united at the base. *a*, well-developed stigma; no pollen; numerous ovules, differing in nothing from those of the normal ♀ flowers. *b*, club-shaped, without pollen, ovules, and stigmatic papillæ. *c*, pollen on both margins of the connectivum; ovules on the convex margin; apex of the connectivum smooth, without stigmatic papillæ, but one of the ovules transformed into a stigma.

Fig. 4. Three stamens united. *a*, not modified; *b*, connectivum much dilated, pollen on either margin, neither ovules nor stigmatic papillæ; *c*, well-developed stigmatic papillæ, pollen (a small quantity) on one margin alone of the much-dilated connectivum, a few ovules.

Fig. 5. Three stamens, modified and united: *a* and *b* without pollen, with large stigmas and numerous ovules; *c* nearly normal, only the tip of the connectivum being somewhat enlarged and provided with small stigmatic papillæ.

Once I saw (fig. 3, *s*), in the midst of the white ovules, a dark yellow body of a club-shaped form, having nearly the size of an ovule, covered by club-shaped papillæ exactly resembling in shape and colour those of the stigma; so that in this case an ovule appeared to have been transformed into a stigma!

Since I found this plant, I have been looking out for others; and yesterday I at length met with a second specimen (growing within 2 yards distance from the first), which promises to offer still more curious modifications. Some of the male flowers of this second plant have been transformed completely into female ones with superior perianth, but distinguished from the normal ♀ flowers by the perianth having (as in the male flowers) two large broad outer and two small narrow inner segments (whilst the female flowers have five segments, one being smaller), and by their having from four to five stigmas and as many alæ

on the ovarium (the female flowers have three). In one of these abnormal female flowers there were some naked ovules between the stigmas beside those included in the ovarium. In the first plant all the ovules of the male flowers are naked. There are some unripe pods on the second plant, all of which are produced by normal ♀ flowers; as soon as they are ripe I shall send you seeds of this second plant also.

FRITZ MÜLLER.

Introductory Remarks to Mr. BROUGHTON's Paper on Hybridism among Cinchonæ. By J. E. HOWARD, F.L.S.

[Read March 3, 1870.]

AT the particular request of Mr. Broughton I engaged to read the accompanying paper. The author also wished that I should adduce any arguments that might occur to me against any point that he has mentioned. This his desire, I conclude, arose from my having frequently urged the study of the different kinds cultivated in India, in order to the selection of the sort most adapted for the production of Quinine, as a necessary point to be attended to by those who would cultivate with profit. I have also expressed my belief in the general permanence of the forms, even of the subspecies or varieties of the plant.

I have nothing to urge, however, against the views expressed by Mr. Broughton as to the occurrence of hybrids, but, on the contrary, living specimens which have occurred in my own limited sphere of observation which seem to me to confirm their truth. I am more doubtful about the occurrence of hybridism in the native places of growth of the Cinchonæ, as I do not think there can be in general the same favourable conditions for the interference of the pollen of different species that occur in their cultivated state. I have not, therefore, so much expectation of light being thrown on the botanical arrangement of the genus as is expressed by my correspondent.