

Ea, exceptis paucis Cephalopodis et Belemnitis, solus collegit Daintree, et loco citato Etheridge specimina illustravit. Etiam ob genera et subgenera incertitudo inter illos feliciter stabilita, quam per characteres magis constantes bivalvatos rite determinare istis completis exemplaribus facilius est quam per descriptiones tantum, longe magis per incompletas et incertas quarum forma maxime fallax est. Cum plurimæ definitiones ad specimina singula Musæorum propositæ sint, facile intelligitur, quam parum ad specierum determinationem et specificam differentiam dijudicandum sufficiant sine amplissima experientia variationis legum inter indigenas. Ex his rationibus ex magna parte pendere fingimus immensum novarum specierum numerum ultimis annis propositarum, quarum dimidium saltem numerum vel synonymas vel jam descriptas sine temeritate enuntiare ausim, quamvis multas, quarum locus et affinitas in generibus tam vastis haud indicata sunt sine ectyporum comparatione numquam determinare liceat. Non satis est speciem ignotam sub nomine novo describere, sed hanc tamdiu in animo volutare donec nexus cum omnibus, ut ait illust. Elias Fries, jam rite cognitis plene eluceat.*

OCCASIONAL NOTES ON THE INFLORESCENCE AND HABITS OF
PLANTS INDIGENOUS IN THE IMMEDIATE NEIGHBOURHOOD
OF SYDNEY.

BY E. HAVILAND.

The Rev. Dr. Woolls, in his Census of Plants indigenous in the neighbourhood of Sydney, enumerates, under the order Rutaceæ, eleven genera, comprising thirty-one species. It must however, be borne in mind, that this census refers to the whole of the County of Cumberland. Even within a very limited area, that is within a radius of six or seven miles from Sydney, the

* Nov. Sym. Myc. in peregr. terris Dan. coll. prolog.

order is rich in beautiful and interesting genera. Of these I select two—*Philotheca* and *Boronia*, and take an individual member of each—*Philotheca australis* and *Boronia pinnata*.

Philotheca australis, Rudge, is a very beautiful plant, well deserving the attention of florists; easy to cultivate, and delighting even in the poorest of soils. It may be found in abundance on the road side, between Manly and Middle Harbour, in the early spring. The flowers are in groups of three or four, on very short pedicels of not more than one line. The lobes of the calyx are five, broad at the base, about one-fourth of the length of the tube, triangular, imbricate, and somewhat coriaceous. The petals five, lanceolate, about eight lines long, and three broad, spreading and reflexed; having a somewhat deep, longitudinal furrow on the face, forming a ridge on the back, of a deeper rose colour than the rest of the petal. The stamens are ten, shorter than the petals, united in the lower parts of the filaments, in a monadelphous circle, completely enclosing the pistil; the broad filaments being so transparent that the pistil may be seen through them. The upper parts of the filaments are free, and densely hirsute. The styles rising from the five carpels, are immediately united in one, and this too, is densely hirsute. The ovary is five-celled, each cell containing two ovules. The foliage is heath-like, the leaves almost terete, nearly if not quite, sessile, erect, and from three to six lines long; while the width does not exceed half a line.

Upon a cursory examination of this flower, one is inclined to think, that, if in so many cases the most careful provision has been made to prevent self-fertilization, equally careful provision has, in this instance, been made to ensure it. In this *Philotheca* we find the pistil so imprisoned, not merely (as in *Boronia*) by the stamens forming a cage of simple bars round it; but so, by the absence of any interstice, as to prevent any insect likely to carry pollen approaching it. The stamens are continued beyond the anthers; and both these projections and the backs of the

anthers are clothed with stiff hairs. Five of the stamens are shorter than the others, and meet over the stigma, quite preventing any approach to it from above. Independently, however, of this, the five longer stamens close over the shorter ones, forming an additional protection. As the anthers are all on the inside of the stamens, of course those of the five shorter stamens are immediately over the stigma. In the course of time, the free portions of the five longer stamens leave their first position, and not only become erect, but to some extent, reflexed; the five shorter ones however, still retaining their guardianship of the stigma. Soon a very narrow passage, caused by the shorter stamens having somewhat separated, will be seen leading to the stigma, and an ordinary pocket-lens will show that the anthers lining the passage have matured and opened, and that the passage contains a considerable quantity of pollen. After this, the five shorter stamens open widely, exposing the stigma.

The close imprisonment of the stigma, till the anthers have opened, and the pollen has lined the passage immediately over it, would lead one to suppose that its purpose was to ensure self-fertilization; but this does not appear to have been the case. Finding, on opening several flowers, that no fertilization had taken place; that in fact, the stigma was not mature, although the pollen had matured and disappeared, I selected ten flowers in all of which both the long and short stamens had opened widely, leaving the stigmas fully exposed. In six I found the anthers open and empty, yet five of the stigmas had not arrived at maturity, one being viscid, but having no pollen on it. In three others the anthers were open and contained a few grains of pollen; but none of the stigmas were mature. In the remaining flower the anthers were open, and appeared to contain all their pollen; the stigma not mature. I then placed some ripe pollen on five of the stigmas of the first lot examined, which were supposed not to have reached maturity. After allowing it to remain in contact for half an hour, it could be blown off, leaving

the stigmas dry and clean, proving that, although the pollen from their own flowers had matured and disappeared, they had not arrived at a condition to utilise it, and, that when they should do so, they would be dependent on the pollen of other flowers.

Perhaps there are few plants which vary more in their manner of growth than *Boronia pinnata*, (Smith). Different localities afford it under such various forms as often to cause one to be uncertain of the species. The colour of the flowers too passes through all shades from rose-purple to white. In this paper I speak of a variety of which specimens have been sent to me at various times, from the more distant parts of Lane Cove. It is nearly white, quite glabrous ; the younger branches almost square. The leaves are pinnate and opposite, generally of seven or nine leaflets, but the terminal leaflet often absent. The costa or midrib of the entire leaf is much dilated, and leaf-like ; but contracted where the leaflets join it. The leaflets are small, not exceeding at the most four lines long and one broad, and mucronate. The flowers are both axillary and terminal, each of the smaller branches ending in a group of three to six, on pedicels twice the length of the flowers ; the pedicels having minute bracts half way between their articulation with the peduncles and the flowers. The calyx is of four imbricate lobes shorter than the tube, broadly lanceolate, but ending acutely, and is very small when compared with the corolla. The corolla consists of four petals, very concave on the inside, six lines long ; very broadly lanceolate, attached to the tube of the calyx. The stamens are eight, rising from the outside of a fleshy, hypogynous disk, swelling out at the centre of the filament, but meeting again, and forming a cage round the pistil. The filaments forming the bars of this cage, although densely woolly at their summits, are very slightly so elsewhere ; and while, unlike *Philotheca*, they are sufficiently open to allow insects to enter, it does not appear that even a small insect can come into contact with the stigma. The filaments are suddenly very much enlarged at their summits,

bearing the anthers on the inside and rather below the apices, and are so spring-like that they press the anthers down upon the stigma closely, covering it so completely as to prevent any approach to it. The stigma is globular and very large; in some instances quite as large as the ovary. Almost before the pollen is mature, the stamens begin to rise, leaving the stigma exposed; but in no specimen that I have examined, although I have found the pollen fully ripe, have I found the stigma prepared to receive it. On the contrary, it has appeared so far from maturity, that I presume that before that condition is attained, the pollen will have disappeared; which it soon does from various causes, but chiefly by the agitation of the plant by the wind. In fact in several instances, in this plant, also I have found the anthers empty or absent, before the stigma was mature. What the result to be attained is, in the case of the *Philotheca*, by imprisoning the stigma in a close cage until the pollen has matured and dispersed, or, in the *Boronia*, by covering it closely by pressing its own anthers upon it, by the spring-like action of the stamens, till the pollen has all but matured, and then setting it free, still not in a condition to utilise the pollen till after it has dispersed, may be open to question. May it not be, however, that the shielding of the stigma in either case, to a great extent, from the influence of light and heat, retards its attainment of the condition necessary to receive and utilise pollen till after the anthers of the same flower have matured and dispersed it, thus making the stigma dependent on the pollen of some other flower, and ensuring cross-fertilization. These are not isolated cases. In my search for botanical specimens, I meet with so many instances, and the employment of such various and often curious means to ensure cross-fertilisation, that I am inclined to think nature intended it to be the rule even in the Vegetable Kingdom.

The common rose-purple variety, or what I take to be the typical form of *Boronia pinnata*, differs much from the form I have described. The flowers are more crowded, the leaves much

larger, the filaments very much less thickened at the summits, and the stigma, instead of being almost or quite as large as the ovary, is so small as scarcely to be distinguished from the short style. The difference in this respect is so great, that, were it not that Bentham mentions that this species is sexually dimorphous, and that I am assured by unquestionable authority that the two forms are identical, I should consider them distinct species.

NOTE ON SOME POINTS IN THE ANATOMY OF THE PIGEONS
REFERRED TO BY DR. HANS GADOW IN A RECENT PAPER ON
THE ANATOMY OF PTEROCLES.

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In part II. of the Proceedings of the Zoological Society of London for 1882, which has just come to hand, I find in a paper by Dr. Hans Gadow on the Anatomy of *Pterocles* some statements called forth by a paper of mine published in the Proceedings of this Society (Notes on the Anatomy of Birds, III.—The Myological Characters of the Columbidae, Vol. iv., pp. 306—310 [1880].)

I must first explain that the paper in question was in reality an abstract of a very much longer and more detailed account of the entire system of limb-muscles in the Pigeons, together with comparative studies of many other birds, which was presented to the Society at the time, and this may serve to account for the condensed form in which it appears. At the end of the short abstract I summarise the leading characteristics of the muscular system of the Pigeons in five statements. These I regard, taken all together, as enabling us to give a myological definition of the order. I do not state that all these points are peculiar to the Pigeons, I merely allege that they are characteristic of them as a group—a distinction which appears to me perfectly obvious, but which Dr. Gadow seems not to apprehend. These five



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