

in rice fields and nurseries	17 occasions.
in rubber plantations (grass weeded or weedy) ..	38 "
in tapioca crops	3 "
about houses in villages (kampong land) ..	14 "
on grass pastures	8 "
on roadsides which are chiefly like pastures ..	10 "
on the railway embankments which are chiefly in lallang	2 "
in lallang waste land	38 "
in lallang turning to scrub (belukar)	1 "
in pasture turning to scrub (belukar)	1 "
in scrub (belukar)	8 "

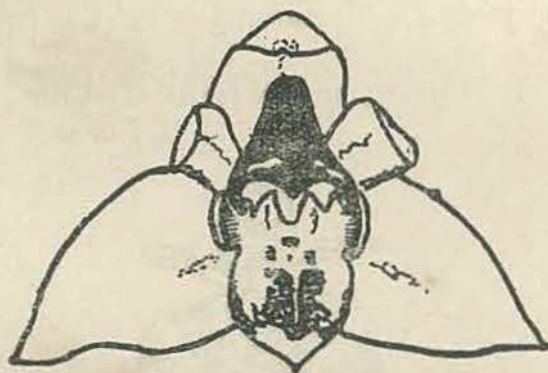
P. C. COWLEY-BROWN.

I. H. BURKILL.

ORCHID NOTES

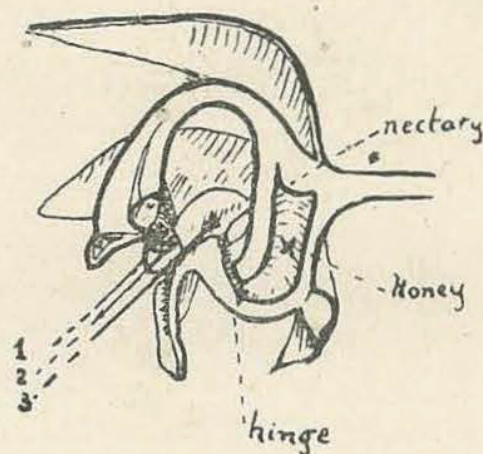
THECOSTELE SECUNDA, RIDL.

The flower of this orchid was described in the Bulletin on p. 318. To that description it appears well to add the annexed figures, and a note on the mechanism as regards pollination by insects.



Thecostele secunda,—flowers. $\times 2$, from in front.

A visiting insect should settle on the lip and be of such weight as to depress it on the hinge marked in the sectional drawing. When the lip is depressed, a way is opened to the abundant honey through the groove over the centre of the crest. Just under this groove is a yellow spot as described on p. 318. When the weight of the insect is removed the lip returns to the position in which it was, closing the road to the honey again. The part of the lip fitting over the mouth is furnished with hairs such as would prevent small insects from entering the honey-cavity.



Flower of *Thecostele secunda* in section:
1 side lobe of the lip; 2 interlocking lobe
of the column; 3, crest of the lip.

On either side of the central groove, between the crest of the lip and the bracket-like side lobes, are other grooves into which dovetail the side arms of the column. The lip is free to move up and down on its hinge; but if the visiting insect should give a lateral thrust to it, the crests and side lobes engage the side arms of the column and prevent displacement. The insect is thus kept in the middle line with its head immediately under the sexual organs, where only it can be of use to the flower in effecting pollination.

In the black and white drawing the black parts of the flower are either deep magenta or claret, the light parts pale green.

THECOSTELE MACULOSA, RIDL.



x 2.

Flower of *Thecostele maculosa*
x 2. from in front.

Thecostele maculosa, Ridl. (*Collabium Wrayi*, Hook. f.) recently flowered in the Botanic Gardens, Singapore, and a figure of it is here given in black and white, to correct impressions gained from that in the *Icones Plantarum*, 4th series, I., 1892, t. 2065, and also on account of certain ways in which the colour is not as described.

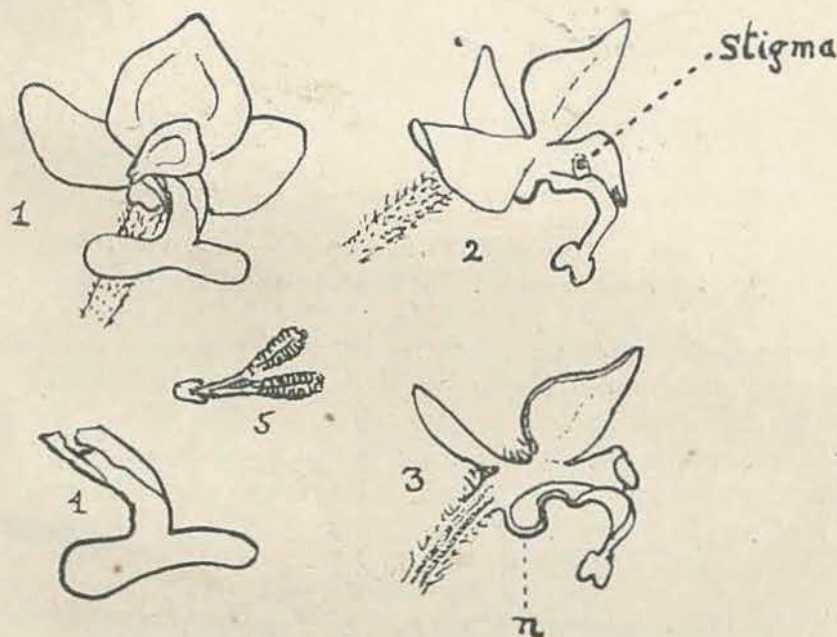
The colour of the flowers is maroon and white, the latter passing to a dull yellow at the base of the sepals and petals. The

position taken by the flower is strictly horizontal. The raceme is directed downwards, but just upcurved at the tip. The flowers open in acropetal succession. The large nectarial cavity with a yellow nectary in the upper wall near the base contains abundance of honey; approach to it is guarded by the lip closing the entrance and by papilla-like hairs arising in it. Lesser hairs cover the forward surface of the lip affording a foothold for visiting insects. The distribution of colour in the flower is best understood from the figure. A visiting insect seeking honey is kept in the middle line of the flower by the side lobes of the lip, which like crooked little fingers, approach the arms of the column.

Thecostele maculosa has been collected from various places between Kedah and Malacca and on the coast of Pahang.

HAEMARIA DISCOLOR, LINDL.

Haemaria discolor and its variety *Ordiana*, Williams, have flowered very abundantly in the Botanic Gardens recently, and the curious distortion observable in the column and lip has been studied. Each inflorescence carried 10-15 flowers so that considerable number have been available for examination. Invariably was the distortion in the one direction as represented in the figure.



1. Flower of *Haemaria discolor* form in front \times 2; 2. from the side; 3. in section, n being the honey sac. 4. the lip; 5. the pollinia.

The hood (composed of one sepal and two petals fused) rises obliquely over the sexual organs; the lateral sepals are half reflexed as figure 2 shows: they are not distorted. But the column is twisted in the direction of the movement of the hands of a clock through about 50 degrees, bringing the stigma to such a position that it is exposed towards the side of the flower (figure 2). The lip from a little median honey sac is bent out of the median line towards the opposite side of the flower to the stigma, and towards the base its edges partially make a tube: it does not make a landing

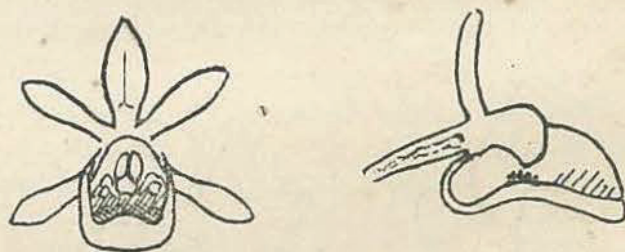
stage under the sexual organs at all, and with its limb like an inverted T offers a restricted surface for an insect to settle upon. This surface is slightly twisted often.

Exactly how pollination is affected has not been ascertained; but all the earlier flowers in the Gardens obtained it.

It will be gathered from what has been said that the condition figured "from nature" in Engler's *Natürliche Pflanzenfamilien* II part 6, 1888, p. 118, with the lip uppermost, has not been met with: and as the old figures (*Botanical Magazine*, 2055 and *Botanical Register*, 271) represent the flower in the position, invariable at Singapore, with lip below, it is questionable if such an inverted position is normal in any race.

TAENIOPHYLLUM SERRULA, Hook. f.

Taeniophyllum Serrula grows on the bark of two trees in the Botanic Gardens, both *Dillenia indica*, and both within a few yards of the bank of the Cluny Lake.



Flower of *Taeniophyllum serrula* $\times 4$. 1, seen from the front and (2) in median section.

It does not grow over all the branches or even over the whole surface of the chosen branches but only on the lower sides of those facing more or less to the south or lake side. At the north side is a bamboo fence and then a quiet roadway. It flourishes best on the tree which lies lowest. Removed with the bark carefully to a site away from water the plants died: but in the site of its own choosing, it is plentiful enough.

This note is published to record that—like *Dendrobium crumenatum* or *Saccolabium Calceolus* it is a periodic flowerer. The little flowers open on the different plants about dawn, and wither, whether fertilized or not towards dark, to be followed by a fresh crop after an interval which is being studied. These are the dates on which flowering was observed:—

October 1st, 1915.

October 13th, interval without flowers 11 days.

October 26th, interval without flowers 6 days.

October — a flowering which was not accurately recorded.

November 6th, double interval, 15 days or, say, 7 + 7 days without flowers + 1 day of flowering.

November 25th, interval without flowers 13 days.

December 7th, (a few flowers also on the 8th), interval without flowers 11 days.

December 22nd, interval without flowers (13 or) 14 days.

January 1st, interval without flowers 9 days.

January 8th, interval without flowers 6 days.

January 20th, interval without flowers 11 days.

At this stage the observations were interrupted. They will be resumed in the next season.

The spikes produce many flowers in succession. Sometimes fertilisation of one will arrest the flowering of the inflorescence, but sometimes not. Once and then as an abnormality two flowers were open on the spike at the same time: they stood side by side. About two per cent of the flowers obtained pollination during the period over which the observations extended. How has not been ascertained. The flower has a white lip, a purple anther cap: and elsewhere it is clear greenish yellow. It stands horizontally as the drawing indicates. No free honey has been found; but the whole lip is very fleshy.

I. H. BURKILL.

RECORD OF A FEW ORCHIDS.

and other interesting plants (Monocotyledons) found in
Penang, Setol, Kedah Peak and Bukit Wang
in the north of Kedah.

ORCHIDACEAE.

1. *Oberonia* sp. Jenun (South Kedah).
2. *Liparis* sp. Kedah Peak.
3. *Platyclinis linearis*, Ridl. Kedah Peak.
4. *Dendrobium Kelsallii*, Ridl. Kedah Peak.
5. *Dendrobium ericaeflorum*, Lindl. Kedah Peak.
6. *Dendrobium trinervium*, Ridl. Setol.
7. *Dendrobium hercoglossum*, Reichb. f. Bukit Wang.
8. *Bulbophyllum linearifolium*, King. Kedah Peak.
9. *Bulbophyllum longiflorum*, Ridl. Kedah Peak.
10. *Bulbophyllum fascinator*, Rolfe. Setol.
11. *Eria albotomentosa*, Lindl. Kedah Peak.
12. *Eria monticola*, Hook. f. Kedah Peak.
13. *Eria teretifolia*, Griff. Kedah Peak.
14. *Eria velutina*, Lindl. Lankawi.
15. *Thunia alba*, Reichb. f. Bukit Wang.
16. *Ceratostylus pendula*, Hook. f. Penang, Penara Bukit.
17. *Plocoglottis foetida*, Ridl. Setol.
18. *Tainia Maingayii*, Hook. f. Kedah Peak.
19. *Calanthe angustifolia*, Lindl. Kedah Peak.