When mature, they are nearly two inches long.

The chrysalis is of a brilliant green, angular as that of the familiar tortoise shell butterfly (*Vanessa urticæ* Linn) and hangs by the tail from the under surface of some object.

The butterfly is of a rich brown colour.

I. H. BURKILL.

NOTES ON PLANTS OF INTEREST IN THE BOTANIC GARDENS, SINGAPORE.

Porphyroglottis Maxwelliae, Ridley.

Among the orchids which flowered in the Botanic Gardens, Singapore, in 1913, was *Porphyroglottis Maxwelliae*. This strange orchid of still somewhat doubtful affinities was described by Mr. Ridley in 1896, from dried specimens and drawings sent to him from Sarawak. Otherwise it has remained unknown, and living plants had been in no Botanic Garden, until a small collection from Dutch Borneo was offered to him for purchase in 1911. By chance *Porphyroglottis Maxwelliae* was in the collection.

A new Variety of Eria gracilis, Hook. f.

An orchid which has recently flowered in the Botanic Gardens is *Eria gracilis* in a variety not described. The lip is obcuneate, with the middle lobe reduced to a minute point overtopped by the truncate side-lobes. It may be called var. *obcuneata*.

There is a label on the Singapore plant calling it a "Dendrobium from Java." Possibly this label has been transferred from another plant, for *Eria gracilis* is a local orchid of Singapore, extending northwards to Penang, but unknown in Java.

The flowers are flesh-coloured with sparse crimson hair outside and the lip has a crimson line down its very margin, as in the allied *E. oligantha*, Hook. f.

A new Variety of Sarcochilus stenoglottis, Hook. f.

A variety of *Sarcochilus stenoglottis* flowered in the Gardens early in August. Unfortunately the origin of the plant is unknown.

Sarcochilus stenoglottis was described by Sir Joseph Hooker in the Flora of British India, vi. (1894) p. 34; and a plate is given in the Annals of the Royal Botanic Gardens, Calcutta, v., (1895) t. 62, a reproduction of a sketch made in Calcutta in 1883, from a plant obtained in Sumatra by Kunstler.

The plant which has come under observation has red colour neither in the peduncle nor in the flower; and the margins of the lip are not frilled, but even.

A drawing has been placed in the Singapore collection.

Habenaria Havillandi, Kränzlin.

In 1912, Mr. J. W. Anderson, the Assistant Curator, was sent on a collecting trip to Sarawak, whence he brought back a series of interesting plants. One of the plants proved to be the orchid *Habenaria Havillandi*, Kränzlin. Large green flowers are always interesting, because the number of species having them is small; *H. Havillandi* is one of the number. The flowers, vertically from the tip of the upper sepal to the tip of the labellum, measure 2 cm.; the spur is long and full of honey at the lenticular end; the flowers have a faint but pleasant scent. Many of them are open together, so that in a conservatory with a setting of flowers of other colours this orchid is quite conspicuous. It flowers twice a year.

The explosive Flowers of Plocoglottis porphyrophylla, Ridley.

Another orchid, brought back by Mr. Anderson from Sarawak, proved to be *Plocoglottis porphyrophylla*, a plant of wide distribution in Malaya, but because inconspicuous and a lover of deep shade, little known. The Sarawak plant carried only one flower open at a time, but it remained in flower over more than three months, producing a fresh one every few days until the raceme was more than two feet long, and had borne fifty. Specimens and drawings in the Singapore herbarium indicate that sometimes two flowers may be expanded at the same time; this, however, never happened in the plant which came under observation.

The flowers have a most conspicuous asymmetry, are explosive, and exhibit an extraordinary series of changes, which have passed undescribed hitherto; indeed the existing descriptions of the flower are quite inadequate for giving any true idea of its appearance. Other species of Plocoglottis have bilateral symmetry, and seem widely distinct enough from our subject.

It is convenient to begin the description of the flower by an account of the half-grown bud.

The ovary begins to twist, as is the way in orchids, when by its growth it has overtopped the bract; it carries the swelling bud through about 75 degrees and then stops twisting. During this twisting the dorsal sepal outgrows the other sepals pushing over the apex of the bud. If the bud be dissected the tips of the lateral petals will be found within the apex, but the lip only slightly overpasses the middle of the bud.

All the sepals at this stage are similarly narrowly ovate, the lateral sepals being asymmetrically so. The lateral petals are linear, and curved round the column to meet at their tips. The lip is nearly as broad as long, cuspidate above its broad shoulders, with the margins in the lower part frilled and turned under. If these margins be uncurved it will be seen that they are the lateral lobes of the lip. Under each broad shoulder a wart has begun to form: three lateral nerves end close to each of these warts.

Between this stage of the bud and maturity the following changes take place. The contiguous halves of the lateral sepals thicken from the middle upwards; the cuspidate tip of the lip turns back, its shoulders enlarge and the warts become sharp little upstanding cones, while the side lobes increase along their margins so that they are too full for the space that they have and towards the base of the lip tend to form an upstanding rounded crest.

Two very fleshy bodies, being the staminodes, lie within the curve of this crest, one on each side.

The opening of the flower takes place late in the afternoon or in the early part of the night. In it, as a commencement, a slit appears between the lateral sepals from the middle, downwards first, and then to the tip. Next these lateral sepals break away and slowly take a position at right angles to the ovary, and their thickened areas begin to become convex inwards and thr w the thin parts back. Following this movement the lateral petals rapidly elongate, curving over strongly so that their points pass between the bases of the lateral sepals, and in this curious action they deflex the lip on its base holding it down against a certain amount of resistance, in contact with the lateral sepals. Thus the flower gapes somewhat.

If in the early stage of the flowering, the lateral petals are cut, the lip springs up elastically against the column, being forced up by the turgid tissue at its base and perhaps in less measure by the pull of the margin. Meanwhile the dorsal sepal has not moved.

This is the first stage of the flower and lasts into the night. It is accompanied by the development of two eccentricities: one of these is a movement of the column towards the right hand side of the flower (right hand of an observer facing the flower), whereby later it comes into contact with the shoulder of the lip; the other is the unequal curving of the lateral sepals, the upper curving most, whereby they come to form a platform with their swollen areas presented forwards and upwards, and one, the upper, presses on the tip of the labellum. The bilateral symmetry which was present in the bud is now completely lost.

During the night the second stage comes on, beginning with the turning back of the dorsal sepal, and continued by the straightening of the lateral petals. The upper of the lateral sepals no longer held away from its fellow by the lateral petals, now moves down to be in contact with it, and is thus almost median as regards the lip, and as

the lateral petals move away the lip is left caught lightly against its convex swelling, and held folded down as the lateral petals placed it. A touch now frees the lip and causes it to spring up against the column, its right shoulder being under the pollinia. Pressed thus against the column it remains while the flower withers on the following morning. In withering the lateral petals curve inwards until their tips meet; the lateral sepals rise up until they touch the lower side of the lip; the dorsal sepal follows; and the life of the flower is over.

It has no scent as far as the human nose can test it. It has no free honey. Its colours are lemon yellow to yellowish green with deep crimson markings on the lip; and the swollen parts of the lateral sepals are maroon.

How it is fertilised it is not possible as yet to state, but it would seem likely that insects of rather small size, attracted to the flower, are trapped by the up-springing of the lip against the coloumn, and in struggling to free themselves effect pollination. Sections through the swollen parts of the lateral sepals show that this tissue contains large cells with raphides towards the outer surface, and small cells towards the inner.

The mechanism is most curious; the lip is a trigger put into place by the lateral petals, and held there by one of the lateral sepals. This alone makes it of unusual interest; but the interest is heightened by the angle at which the flower stands, by the movement out of the median plane of the column, and by the movement towards it of a lateral sepal.

Hapaline appendiculata, Ridley.

A third interesting plant brought back from Sarawak by the Assistant Curator is *Hapaline appendiculata* with variegated leaves. Mr. Anderson had found it plentiful near Bau. It flowered in cultivation in the end of May.

Hapaline appendiculata differs from the two other known Hapalines in having an appendix to its spadix, which slightly overtops the narrow white spathe. Is is the most southern representative of a rather badly constituted genus. It was once before in cultivation in the Gardens, but either was lost or is bedded out in some unrecorded nook under the trees. The specimen grown earlier had dark green leaves without the conspicuous pale green cloudy markings of the new one. The leaves take a peculiar attitude, the petiole bending so as to place them beyond the rim of the plant pot in which they may be grown.

I. H. BURKILL.