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THE
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OF

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Seldom is it better exemplified than when tints of yellow, or yellow and white, are crossed, if the colour be due wholly to yellow chromoplasts in the cell-protoplasm. During the last week or two I have gathered a large number of hybrid Oxlips alongside their parents, the Primrose and Cowslip. One has merely to pluck a blossom of each, and place these in row, to see how closely the hybrid is the mean between the parents. A set of hybrid *Hedychium*s, raised at the Royal Botanic Garden, gives additional confirmation. Thus, the orange-coloured *H. Gardnerianum*, crossed by the white *H. coronarium*, gave *H. Sadlerianum* with a tint exactly intermediate; this, recrossed by the latter parent, gave *H. Lindsayi*, the blossoms of which are of a pale maize-white in bud, becoming white in blossom. Crosses between *H. Gardnerianum* and *H. angustifolium* also verified what one might have predicted.

Hybrids of *Dianthus*, *Geum*, *Saxifraga*, *Gesnera*, *Gloxinia*, *Digitalis*,* *Orchids*, *Montbretia*, &c., might all be noted for their floral parts, as might pitchers of *Sarracenia* and *Nepenthes* for their vegetative leaf-parts.

But knotty points often arise in the study of hybrids, whose parents—one or both—have two or more pigments in their cells. A comparatively simple case of such is *Masdevallia Chelsoni*, in which, as in both parents, we have a dense background of yellow cells, while from the surface arise layer sacs filled with a purple pigment. But when yellow, red, or blue occur in the same or neighbouring cells of a tissue, the hybrid product may take after one or other of the parents in an apparently arbitrary way. Even in such cases, however, I think that the appearances can be explained in a manner that clears away many of the apparent difficulties which beset one when a minute study of hybrids is first entered upon. The full explanation—which cannot be given in a short paper like this—I hope to publish shortly; suffice it to say, that I regard many of the unequal blendings in hybrid colour and structure to be due to incompatibility in chemical or molecular union, and the resulting predominance of that colour which is the more stable or readily evolved of the two.

Study of the period of flowering of plants is still in its infancy, but I venture to think that a comparison of the flowering period of hybrids with that of their parents will yield in the end the most valuable phenological harvest, for we deal then with a connected series of three. During the last twenty years a record of the flowering periods of a few has been kept at the Edinburgh Botanic Garden, and since 1880 a similar record, for fully 800 plants in the rock garden (including several hybrids and their parents) has been kept; while in the *Transactions of the Edinburgh Botanical Society*, vol. xvii., part 2, Mr. Lindsay has recorded the time of flowering of 1408 species during 1887. These, supplemented by limited observations of my own, all point distinctly to a flowering period in hybrids closely intermediate between the parents. To give only one or two examples verified during the present season, *Rhododendron atrovirens* first opened on January 21, and was in full bloom by the 27th; *R. præcox* opened on March 1, but was immediately after destroyed by frost; judging, however, from previous years, it would have blossomed well by March 10; while *R. ciliatum* opened on April 25, and was in full blossom by May 4.

I was rather puzzled for a time to account for the early flowering of *R. Nobleanum*, which from an average of twenty years opens on March 1, while *R. caucasicum* opens from April 25 to 30. I could scarcely imagine that the other parent, *R. arboreum*, would start, even in a milder climate than our own, in the early part of January; but on going over references in Hooker's *Himalayan Journals*, it appeared that in 1848 he saw it flowering on

December 7, for he says (vol. i., p. 274):—"The descent from the Talloong ridge was very steep, and in some places almost precipitous, first through dense woods of Silver Fir, with *Rhododendron Falconeri* and *Hodgsoni*, then through *Abies Brunoniana* with Yew (now covered with red berries), to the region of *Magnolias* and *Rhododendron arboreum* and *barbatum*. One bush of the former was in flower, making a gorgeous show." And he mentions it again and again, up till the end of May. It must be difficult to compare a Himalayan winter climate at 8000 to 10,000 feet with that of our country, but correspondents of this paper might aid towards a satisfactory solution. Great accuracy and copious data have still to be reached, and the inquiry can afford the aid of many workers, while for gardeners there is the possibility of obtaining many crosses which might adorn our cool and hot-houses during winter.

On the constitutional vigour of hybrids I should greatly desire information, rather than attempt to give it, but the behaviour of *Montbretia Pottsi*, *Tritonia aurea*, and *M. crocosmaeflora*, in the Edinburgh Garden during the past winter seems suggestive. The corms of the first appear scarcely to have been injured. Those of the hybrid have been largely killed off—at least, to the extent of 60 per cent.; while *Tritonia*—never hardy in exposed ground—has survived only where it is planted against, and can creep along, the outer side of a hot-house wall. *J. M. Macfarlane*.

NEW OR NOTEWORTHY PLANTS.

ODONTOGLOSSUM × EXCELENS, *Robb. f.*

ONE of the most interesting exhibits at the recent Temple show, was a plant of the above well-known *Odontoglossum*, exhibited by Messrs. J. Veitch & Sons, of Chelsea. It was a seedling raised in their establishment by Mr. Seden, and was produced by crossing *O. Pescatorei*, with the pollen of *O. triumphans*. There are two or three points of interest about this particular plant which deserve to be placed on record. It proves the origin of a very handsome *Odontoglossum* which has now become fairly common in gardens, and which has long been thought to be a natural hybrid, though *O. tripudians* was suggested by Reichenbach as one of the parents, not *O. triumphans*. Mr. Rolfe also believes it to be the first hybrid *Odontoglossum* which has been raised in this country, and successfully grown to the flowering stage. Others have appeared, but have unfortunately died in their infancy. In France, however, there is an earlier record, namely *O. × Leroyanum*, raised by M. Leroy, gardener to Baron Edmond de Rothschild, of Armanvilliers, near Paris, an equally interesting plant, as it proved what has always been supposed to be the parentage of *O. × Wilckeanum*, of which it can only be considered a variety. It was obtained by crossing *O. crispum* with the pollen of *O. luteo-purpureum*. Now that the initial difficulties in the way of raising hybrid *Odontoglossum*s have been surmounted under cultivation, it is to be hoped that further successes may be attained, as it would be extremely interesting to know what the insects of that interesting Andine region have been doing in the past. Speculation has now been changed to certainty in two highly interesting cases. There are several others, in which no reasonable doubt can exist, and hybridists could not possibly choose a more interesting field of research than this.

PLANT NOTES.

SENECILLIS CARPATICA.

AFTER two years' residence in my garden, this coarse plant began to flower the first week in the present month. It makes a stout loose spike, 5 or 6 feet high, with rather sparse pale yellow flowers, about an inch and a half across, rather like those of *Senecio*

japonicus. The form and growth, size and colour of the leaf so exactly resemble those of *Senecio (Ligularia) macrophyllus*, that until it flowered I had confidently set it down as identical with that plant; but it flowers a month earlier, and the spike of the *Senecio* is like a giant Golden-rod. It can hardly be called an ornamental plant, being more fitted for a botanical garden than to decorate a border. In shape the leaf resembles that of the Horse-radish, in size, texture, and colour that of a large Cabbage. *C. Wolley Dod*.

MANTISIA SALTATORIA (*The Dancing Girl*.)

The flowers of this plant make their appearance previous to the leaves, or at least, before they are far advanced in growth. The scapes generally grow about a foot in height, bearing numerous flowers, arranged in panicles; the colour of them, as well as the bracts, is a pale violet, with a conspicuous yellow lip. Very rarely, indeed, do we meet with this plant in cultivation, even in good collections of tropical plants, and its home in this country seems to be chiefly in botanical gardens, to which institutions many a choice plant, popular at one time with bygone cultivators, owes its preservation. It lasts in flower for, at least, one month, and the individual flowers are produced at short intervals. The name *Dancing Girl* is not particularly suggestive, at any rate, to the ordinary observer, and perhaps, requires some stretch of imagination to realise it from merely looking for its likeness to a dancing girl of our generation. The generic name bears reference to the insect Mantis, to which the flowers are said to bear a resemblance, while the specific name implies dancing, so that the name may be taken in either sense.

It is not a plant difficult to cultivate, and the following account of its treatment will suffice. After flowering, turn the plants out of their pots, and remove the old soil from their roots, and repot in a mixture of loam, fibrous peat, and leaf-soil, with enough coarse sand to make the whole sandy and porous. Encourage it to make a good crop of leaves in a warm pit or stove, keeping it as close to the glass as practicable, in order to get the plant well-ripened up for flowering the following year; a little artificial or liquid manure given occasionally will add to its vigour when the pots are getting somewhat filled with roots. Towards autumn, the leaves will commence to decay; it may then be removed, and placed beneath the stage, turned over upon its side, and kept dry until the following March, when it will be noticed to be pushing up its scape. Propagation is best effected by division at the time of repotting. Its habitat is the East Indies; it is figured in the *Botanical Magazine*, t. 1320. *W. Harrow, Botanic Garden, Cambridge*.

ORCHID NOTES AND GLEANINGS.

UROPEDIUM LINDENI, *Lindl.*

THAT *Uropedium Lindeni* is only an abnormal state of *Selenipedium caudatum*, which has become fixed or permanent, may be considered proved, since the very interesting record by Dr. Masters of a plant of the latter, in the collection of Mr. Bull of Chelsea, which produced an abnormal flower, with the flattened lip and the column of *Uropedium*; yet it may be of interest to record a somewhat similar phenomenon which has appeared in the collection of Sir Trevor Lawrence, Bart., M.P., during the present year, especially as Reichenbach on two separate occasions wrote an article to prove the generic distinctness of the two forms. The case now to be recorded is that of a large specimen of the very distinct *S. caudatum*, var. *Wallisii*. One of the racemes produced, together with the normal ones, an abnormal flower, which to all intents and purposes was *Uropedium*, as the median stamen of the inner whorl was perfectly developed and absolutely identical in character and position, while the lip was much flatter

* The late Professor Henslow's paper in the *Cambridge Philosophical Transactions* (for 1843, leaves nothing to be desired further in the present connection.

than in the one figured in these columns (vol. xxvi., pp. 268, 269, fig. 54; also *Journ. Linn. Soc.*, xxii., p. 419, t. 20), though not prolonged into a long tail like the two petals, as in typical *Uropedium Lindenii*. The lateral sepals are free, as in the case of Mr. Bull's plant, not united, as in *Uropedium*. It would be of great interest, though perhaps of greater difficulty, to carry this matter a step further, and ascertain under what particular conditions such an undoubtedly abnormal condition of the species should have been able to increase in its native habitat, to the extent we now believe it to have done, as a distinct race. It would be of interest to experiment to see if it comes true from seed. Since the above was written, a flower of *Uropedium* has, we learn, been sent to Mr. Rolfe by Messrs. Linden, of Brussels, identical in colour with the pale *Selenipedium caudatum* var. *Wallisii*. As the original *Uropedium Lindenii* had rosy petals, like the variety *Warszewiczii*, this circumstance sheds further light on the origin of this singular plant.

CATLEYA MOSSIE, SUNNYHILL VAR.

This remarkable variety, which has flowered several years in succession in Mr. Joseph Broom's collection at Sunnyhill, Llandudno, has large, well-shaped flowers, and an almost wholly rich orange-coloured labellum—its most attractive feature. The only other colour which is present is a white area of small size at the base of the lip, which is not perceptible unless the tube be inspected, and from this white field there radiate a few lines of a purple colour. The orange-colour on the front lobe deepens almost to a brown in a few small patches, and at the edge it fades off to pale buff. *Cattleya Mendeli rubicunda* is another fine *Cattleya* in the Sunnyhill collection. The sepals and petals are pink; the outside of the tube of the labellum is lilac in various shades. The base of the labellum is white, with a most beautiful tracery of crimson thereon, and the front lobe is of rich mauve, with a pink border, which is prettily fringed. It differs greatly from the usual forms of *Mendeli*, that many would fail to recognise it for its colouring, this being more like that of *C. Warszewiczii* (*gigas*). *J. O'B.*

CYPRIPEDIUM NIVEUM ALBUM.

A pure white and unspotted form of *C. niveum* is flowering among a quantity of the ordinary form of *niveum* at the Clapton Nurseries of Messrs. Hugh Low & Co. The only colour appears in the form of two small primrose-yellow spots on the staminode, and which lend additional attractiveness to the flower. The leaves of this rare novelty are darker than those of an ordinary *niveum*, and not marbled with silver.

DENDROBIUMS AT CLAPTON.

In Messrs. Hugh Low & Co.'s nurseries, *Dendrobiums* are largely grown, and their culture appears to be well understood. A walk through the houses in which these plants grow showed that they are kept in a warm moist atmosphere throughout the summer, *i.e.*, whilst the growth is active. The want of a house in which the conditions of a tropical swamp are, to some degree, imitated in summer is sadly detrimental to the successful treatment of many species of *Dendrobiums*. Too often it is the practice to keep the plants in a high temperature during the winter, and comparatively cool and airy in summer. In the latter season these plants require a closer and moister air than is usually afforded, and a very high temperature in winter is as bad for them as a too low one in summer. *D. Parishii albens*, a number of *D. Bensonæ*, *D. crystallinum*, and many other *Dendrobiums*; *Vanda cœrulea* and many *Phalænopsis*, &c., are now in bloom in the Clapton nurseries.

DENDROBIUM PARISHII ALBENS.

Out of the large quantities of *D. Parishii* which have been imported, this, which recently flowered with Messrs. Hugh Low & Co., of Clapton, is the first white variety to be recorded. Its flowers are in every respect similar to those of the type, but

they are white with the exception of a few rose-coloured lines on each side of the lip.

TWO FINE SPECIMENS OF LÆLIA PURPURATA.

Flowers of two very dissimilar and beautiful forms of the showy *Lælia purpurata* come from a rising and enthusiastic Orchidist—J. W. Taylor, Esq., Thorn Hill Tower, Sunderland. The one has sepals and petals of pale lilac, veined with rosy-purple, and with a very finely-expanded and richly-coloured maroon-crimson labellum. The other has white sepals and petals, the latter very broad, and with eight or ten lines of rosy-crimson down each. The lip has yellow on the side-lobes, the front rich dark purple, changing to light purple at the tip.

ODONTOGLOSSUM CRISPUM VAR. VENUS.

This is one of the very finest and best shaped of the unspotted forms of *O. crispum*, its segments broad, and the petals beautifully fringed. Its flowers are white, with a faint lilac tinge on the sepals, a brownish-crimson blotch at the upper surface of the column, and a clear yellow base to the lip. It flowered in the collection of De B. Crawshaw, Esq., at Rosefield, Sevenoaks, where also *O. hystrix*, Rosefield var., has again bloomed. It has flowers nearly 4 inches across, sepals almost wholly yellowish-brown; and petals yellow, blotched with brown. One very attractive feature in this very fine form of *O. luteo-purpureum* is its very broad primrose-coloured front lobe to the lip, which has a large brown blotch at the base.

CYPRIPEDIUM PORPHYROCHLAMYS.

This should be grown in a pot, and raised somewhat above the rim, the soil being a mixture of light turfy loam, good peat-fibre, some small nodules of charcoal, and a little sharp sand, the whole well mixed together. Before potting, let the drainage be arranged in good working order, as the plant requires a liberal supply of water during the whole season. *Orchid Album*, vol. ix., p. 107.

ZYGOPETALUM MACKAYII.

We are of opinion that *Zygopetalum Mackayi* is a plant which, to flower freely, requires to be slightly pot-bound, and therefore, although willing to admit that a good-sized pot is necessary for its sustenance, and to accommodate its large roots, frequent repotting should not be resorted to; therefore, see that the drainage material is properly adjusted, and every season the old soil should be taken out, and it must be replaced with new. The soil in which to grow this plant should be a mixture of good peat-fibre and sphagnum moss, to which may be added a little light turfy loam, from which all the fine particles have been shaken; this must be packed in very tightly. During the summer season a good heat is necessary, the *Cattleya*-house being about the right temperature; it also requires a moist atmosphere, and a liberal supply of water to its roots. *Orchid Album*, vol. ix., p. 107.

CYPRIPEDIUM LOWII.

Although growing naturally as an epiphyte upon the branches of trees, we yet find it to succeed best under cultivation when grown in a pot; this should be well-drained. We have found it thrive best in a mixture composed of one part good light turfy loam, the same of peat and leaf-mould, to which may be added a little chopped sphagnum moss, and a few moderate-sized nodules of charcoal, the whole to be well mixed and incorporated. In potting, the plant should be a little elevated, so that the water may the more readily pass away from the crown and young growths. This plant, like all the rest of the genus, has no pseudobulbs, and therefore requires attention in watering all the year round. In the summer months a liberal supply is requisite, and during the winter sufficient will be necessary to maintain the specimen in perfect health. The warmth of the East India-house suits this species best; it will thrive, however, in the Brazilian-house during summer, but in winter more heat is neces-

sary than is accorded to *Cattleyas*, where these plants are properly rested. *Orchid Album*, vol. ix., p. 107.

MANURES FOR THE GARDEN.

WE gather the following important and interesting facts from a recently-delivered lecture by Mr. Joseph Harris, at the Western New York Horticultural Society.

One of the most important facts in regard to fertilisers, was briefly and tersely stated by Sir J. B. Lawes, in a letter to Mr. Harris last summer, in which he says, "Where the food is, there are the roots."

"At equal prices for nitrogen," Sir John wrote, "I certainly prefer nitrate of soda to salts of ammonia. The superiority on pasture grasses is most decided, and in dry seasons when the grass upon the ammonia plots is quite burned up, there is always plenty of grass where the nitrate is used. We had a great drought in 1870, and we had no grass anywhere, except on the nitrate plots. We found roots 4 feet deep from the surface, evidently following the nitrate, and, of course, getting water from the subsoil." "Where the food is, there are the roots."

Soluble phosphoric acid and soluble potash and ammonia salts do not move about in the soil. They remain pretty much where we put them. But nitrates will move about in the water of the soil. During a drought the soil near the surface is dry, and moist at a lower depth. The nitrates follow the moisture, and the roots follow the nitrates. It may be said that the roots follow the moisture; but this will not explain the fact mentioned by Sir John Lawes that, "in dry seasons, when the grass upon the ammonia plots is quite burned up, there is always plenty of grass when the nitrate is used. In the Rothamsted experiments on grass, manures of all kinds are used on different plots, and yet during the drought of 1870 there was no grass anywhere except on the nitrate plots. The moisture of the subsoil, without food, would not draw the roots, or if it did, they could not live and thrive without appropriate food.

While the farmer has to deal with only half-a-dozen different crops, the horticulturist, florist, nurseryman, and fruit-grower, have scores and hundreds of different plants to feed. All plants are composed of the same elements, but there is a great difference in the amount of heat, moisture, and food best suited to their healthy growth.

Professor Voorhees, of the New Jersey Experiment Station, found that two applications of nitrate of soda to Tomatos; one, when the plants were set out, and one a month later, when the fruit was beginning to set, produced a larger crop than the same amount of nitrate applied at once at the time of planting. Tomatos require plenty of heat, and it may be desirable to apply the nitrate while the plants are growing, in order to attract the roots into the warm soil near the surface. The same may be true in regard to Melons. For outdoor Roses in permanent beds, the author's experience leads him to think that it is desirable to get the subsoil rich in nitrates. He has used nitrate of soda for several years, and the longer he uses it on a bed of Roses, the more vigorous are the plants, and the more luxuriant and glossy are the leaves. He gives them a heavy dressing every spring, and presumes that the subsoil is rich in nitrates, and that the roots follow the food.

Many letters from florists and fruit-growers have been received asking about nitrate of soda. The florists ask especially in regard to its effect on Roses in the greenhouse. Because nitrate has a wonderful effect on Roses out-of-doors during the bright sunny weather of summer, it does not follow that it will be equally beneficial on Roses in the greenhouse. The compost used is probably rich in plant-food. When a plant has all the food it can use, applying more will do no good. In such a case the measure of growth is determined by the amount of sunshine, and during the winter months it is not probable that nitrate of soda would have much effect on flowers in the greenhouse. It may well be, how-