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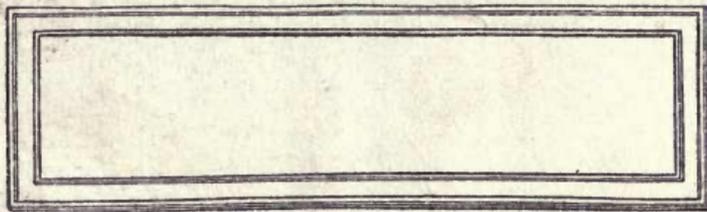
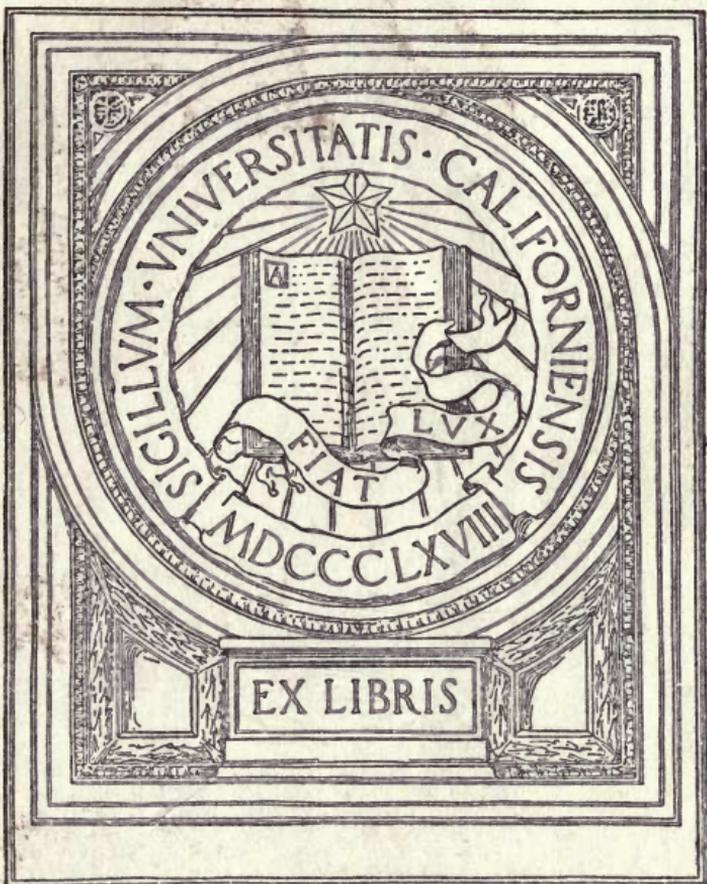
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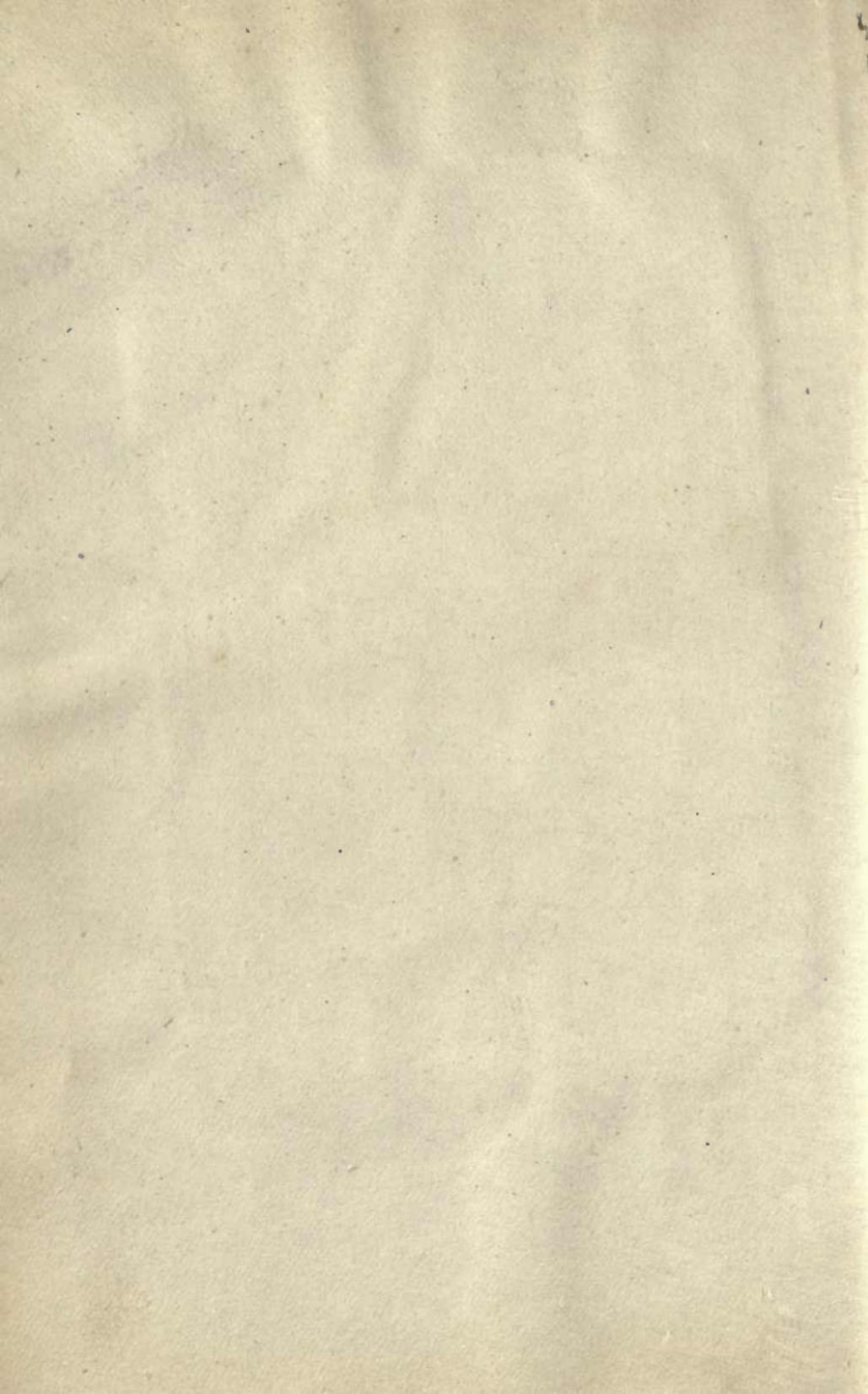
COOL ORCHIDS
AND
HOW TO GROW THEM
—
F.W.BURBIDGE

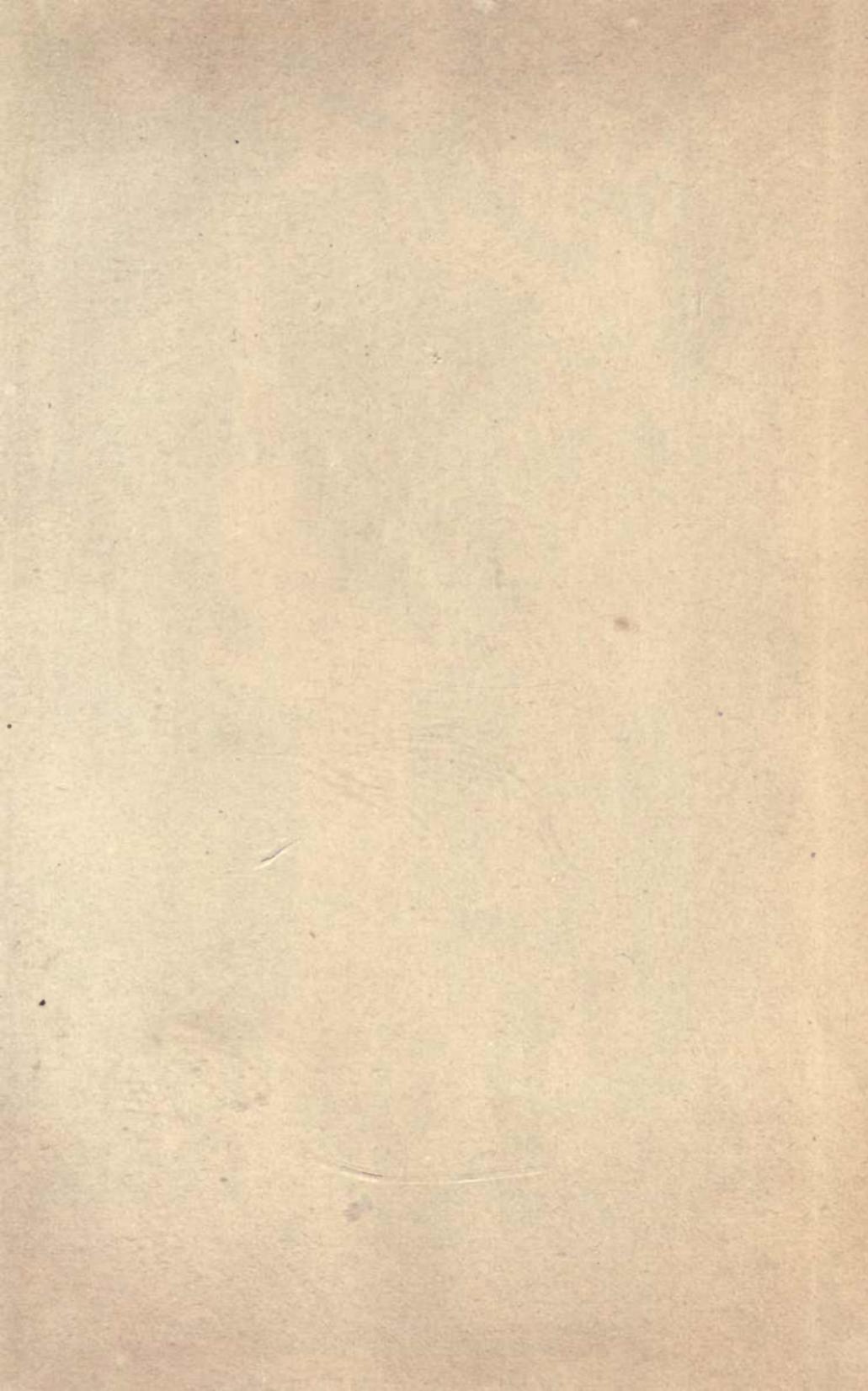
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Orchid House in the Natural Style.

COOL ORCHIDS,

AND

HOW TO GROW THEM;

WITH A DESCRIPTIVE LIST OF ALL

THE BEST SPECIES IN CULTIVATION

BY

F. W. BURBIDGE,

Formerly of the Royal Botanic Gardens, Kew. Author of "The Art of Botanical Drawing," &c., &c.

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PREFACE.

COOL-GROWING ORCHIDS have a great future before them. Many of them may be grown to perfection with the same trouble and expense that are required to grow a Heath or an Azalea. The house in which they will succeed best should be one whose climate resembles that of a genial promenade rather than a vapour bath—an atmosphere peculiar to the East Indian House.

We have yet to import some fine additions to the group of cool Orchids generally, for many of the best of the Masdevallias, Cyripediums, and Odontoglossums yet linger unseen in their native habitats. Who shall say what novelties will be brought to light when the western slopes of the Andes or the mountains to the north of India have been thoroughly explored by collectors?

The works of Bateman, Warner, Anderson, Williams, and others having created a love for Orchids, we offer this little hand-book as an easy and simple guide to the general cultivation of such as will luxuriate freely in a cool or intermediate temperature. The frontispiece here figured was originally published in the first volume of the *Journal of the Royal Horticultural Society of London*.

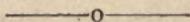
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COOL ORCHID GROWING.



INTRODUCTION.

WHEN Orchids were first imported into this country, from tropical and subtropical regions, an idea that they all required excessive heat to grow them, appears to have been promulgated and accepted as gospel truth by horticulturists of all classes. To the earlier Orchid-growers it would appear to have been a matter of but little moment where a plant might have come from, or under what climatic conditions it grew in its native habitat. The Orchids under their management might come from the humid valleys of the Indian archipelago, the arid regions of South or Western Africa, the mountain chains of Mexico or Peru, or even the snow line of the towering Andes, but their treatment was the same, and they were placed in the hottest temperature at command; and even now the highest temperature often means the driest, and this was specially so under the old flue system of heating. Under these adverse conditions we can hardly wonder that many of the newly imported Orchids died in a few months, more or less, after their introduction. Now and then, however, they produced a few flowers, often the last effort of expiring nature, and scarcely properly developed; still their delicate colours and grateful fragrance soon began to be spoken of from mouth to mouth, as they flowered at intervals in the early collections. At one time it would be the celebrated Loddiges who would summons

the savans and literati of the day to inspect some new wonder among the then marvellous "air plants." Then it would be at Chiswick in its palmy days, when, as the acknowledged head centre of horticulture, if not of fashion, everything ran smoothly as a marriage bell, while not unfrequently the then authorities at Kew had the indescribable pleasure of seeing one or other of these lovely plants unfold their delicate petals for the first time in Europe. Although a large proportion of the first, or early specimens, might now be considered but poor plants, still they attracted the notice of nearly everyone interested in plants at the time, including the Duke of Devonshire and the celebrated Mrs. Lawrence, and they have rapidly risen in the estimation, not only of the professional horticulturist, but also of the general public ever since.

Those who invest in Orchids judiciously, and employ men of intelligence and skill to grow them, will receive good interest for their capital. In most cases their plants will increase in value, while the real and lasting pleasure which ever attends the mind capable of contemplating these living wonders, will amply repay any slight outlay on these the most beautiful of all plants. We would not be understood as implying that Orchids alone are worthy of culture, that they only can inspire the heart with kindly feelings and thankfulness. On the contrary, we argue that all plants are beautiful, all worthy of our respectful admiration, and we shall find that the more we understand of their cultural requirements and economy, the more we shall admire them as they one by one open their delicate flowers. All plants are beautiful—Orchids are superlatively so, and not by any means so difficult to cultivate as some would have us suppose. Still the old idea of excessive heat is rigidly adhered to by many, although we rarely find Orchids enjoying vigorous health in such places, while in the comparatively few places where cool Orchids are cultivated in

real earnest, they may be found enjoying the most luxuriant health. The finest collections of *Odontoglots*, *Disas*, *Oncids*, and *Masdevallias* in this country have been subjected to a cool system or *régime* since their first introduction. This is a very important fact; for every Orchid grower knows that healthy imported plants are far better to deal with than such debilitated specimens as have been ruined by bad cultivation in a high and dry atmosphere. Although many Orchids grow well in a low mean temperature, still they require the atmosphere to be heavily charged with moisture, and the *Sphagnum Moss* on the pot tops should be as fresh and grow as freely as if in its native swamps. Wherever, in our Orchid houses, we find *Sphagnum* and *Droseras* growing freely on the tops of the pots, we also, as a natural sequence, find the Orchids looking green and healthy. The reason of this coincidence is simply this—the *Droseras* and *Sphagnum* will only survive in a moist, moderately-shaded situation, and the shade and moisture requisite to keep them alive are also necessary to the vigorous health of the Orchids. The only reason why we cannot extend this rule is, that the *Moss* and *Droseras* do not absolutely require artificial heat, and the Orchids do for part of the year at least. Robert Warner, Esq., of Broomfield, has been very successful in his attempts at cool Orchid growing, and with him, as with others, the growth under this *régime* has been vigorous, producing great, plump, well-ripened pseudo bulbs, fine foliage, and abundance of finely-developed flowers.

A plant of *Odontoglossum Alexandræ* grown by Mr. James Anderson, at Meadowbank, produced a fine branched spike, bearing fifty-six flowers. This plant was grown along with many other *Odontoglots* and *Masdevallias*, in a cool pit, and has never been surpassed so far as flowering is concerned. Another remarkable instance occurred at Fernichurst, the seat of E.

Salt, Esq.; a plant of *Oncidium macranthum* produced a long flexuous branched spike bearing seventy-seven noble flowers. The house in which this plant is grown, along with half-a-dozen other plants of the same species, is kept very cool, the atmosphere is very moist, and the temperature not unfrequently descends as low as 38° , though as nearly as possible the mean winter temperature is 45° , that is 50° for the maximum and 40° for the minimum range.

Cool Orchid growing was long ago practised on the continent, for we find that in 1852 M. François Josst, gardener to Count Thun Hohenstein, at Tetschen, in Bohemia, grew several Orchids out of doors in a sheltered position. We will, however, let him relate his own mode of procedure:—

In 1852 I observed that some of the species did not flower well; and it then occurred to me to place them in the open air in the early part of July. The plants which I put out were *Brasavola glauca*, *Cymbidium marginatum*, *Cypripedium insigne*, *Dendrobium Pringianum*, *D. speciosum*, and *Lycaste Skinneri*. They grew perfectly, although in the morning the temperature was sometimes as low as 5° Reaumur (43° Fahr.). In the daytime the heat in the shade was often as high as 30° Reaumur ($99\frac{1}{2}^{\circ}$ Fahr.). Tetschen is subject to frequent changes of temperature; it is surrounded by mountains, and is in a valley along which the Elbe flows after receiving all the waters of Bohemia. I took the plants in at the end of August. After a short time flower-buds made their appearance, and a little while afterwards flowers followed in perfection. This good result led me to try the same experiment again on a larger scale; and I have since repeated it every year, until I am now in the habit of putting seventy-five species or varieties out into the air for three months in the year, viz., June, July, and August. What I do is this: I select a half-shady place, where I put some trunks of trees (Oaks), on which I place my baskets of Orchids. Between the trunks I plant Ferns, some *Philodendron pertusum*, *Tradescantia zebrina* and *viridis*, and *Cissus marmorea*, so as to produce a pretty effect. In order to protect the plants against the scorching rays of the sun and very heavy rains, I cover the spot with canvas, but

I endeavour to avoid too much shade, for I find that plants which are shaded too much never flower so well as others. I water in the ordinary way employed in hothouses. This year the temperature has several times fallen as low as 4° Reaumur (41° Fahr.), but the plants have not suffered in the least; they are even more vigorous; several of them actually flowered. These facts prove that many gardeners keep their Orchids and other exotics too hot. All plants require some period of rest in order to vegetate well. The following is a list of the Orchids which I treated in the way above described:—

| | |
|---------------------------------|-----------------------------------|
| Barkeria spectabilis, Batem. | Lycaste superbians, Lindl. |
| Brasavola glauca, Lindl. | „ violacea, Rehb. fil. |
| Calanthe striata, R. Br. | „ aromatica, Lindl. |
| Cattleya citrina, Lindl. | „ Colleyi, Lindl. |
| Cœlia macrostachya, Lindl. | „ consobrina, Rehb. fil. |
| Cypripedium insigne, Wall. | „ cruenta, Lindl. |
| „ „ var. parvi- | „ Skinneri, Lindl. |
| florum, Rehb. fil. | „ „ var. alba, Hort. |
| Dendrobium calaminiforme, Lodd. | „ „ var. latimaculata, Hort. |
| „ Jenkinsii, Wall. | „ „ var. leucochila, Hort. |
| „ Pringianum, Bidw. | „ „ var. picta, Hort. |
| „ speciosum, Sm. | Maxillaria cucullata, Lindl. |
| Epidendrum Candollei, Lindl. | „ tenuifolia, Lindl. |
| „ cochleatum, L. | Odontoglossum bictoniense, Lindl. |
| „ diffusum, Sw. | „ citrosmum, Lindl. |
| „ falcatum, Lindl. | „ Cervantesii, Llave. |
| „ radiatum, Lindl. | „ grande, Lindl. |
| „ selligerum, Batem. | „ Insleayii, Lindl. |
| „ Skinneri, Batem. | „ læve, Lindl. |
| „ Stamfordianum, Batem. | „ nebulosum, Lindl. |
| „ varicosum, Batem. | „ pulchellum, Batem. |
| „ virgatum, Lindl. | „ „ var. grandiflorum, Hort. |
| „ vitellinum, Lindl. | Oncidium bicallosum, Lindl. |
| Gongora galeata, Rehb. fil. | „ filipes, Lindl. |
| „ Batemani, Rehb. fil. | „ leucochilum, Batem. |
| „ luteola, Rehb. fil. | „ microchilum, Batem. |
| Lælia acuminata, Lindl. | „ sphacelatum, Lindl. |
| „ albida, Batem. | „ suave, Lindl. |
| „ anceps, Lindl. | Sobralia decora, Batem. |
| „ „ var. Barkeriana, Hort. | „ dichotoma, R. et. Pav. |
| „ „ var. superba, Hort. | „ Liliastrum, Lindl. |
| „ autumnalis, Lindl. | „ macrantha, Lindl. |
| „ candida, Hort. | „ violacea, Lindl. |
| „ furfuracea, Lindl. | Stanhopea connata, Rehb. fil. |
| „ Galeottiana, Morren. | Trichopilia tortilis, Lindl. |
| Lycaste majalis, Lindl. | „ „ var. pallida, Hort. |
| „ rubescens, Lodd. | |

Although, as is proved by the above collection, many Orchids

will grow well in a low, moist temperature, or even out of doors, still it is essentially requisite that a proper selection be made of those genera and species which are amenable to cool treatment, or very disastrous results may follow its adoption. No one would for a moment imagine that the *Phalænopsids*, *Aerides*, *Vandas*, and *Dendrobes* from the low-lying humid tropical regions could be successfully grown in the very cool and moist temperature so highly recommended as suitable for *Odontoglossums* and the cooler *Oncids*. Nor can the last-mentioned endure the dry resting period so essential to most of the tropical *Dendrobes*. Some growers may argue that these plants, *i. e.*, *Odontoglossums* for example, do not come from a cool temperature. We can well afford to allow them their own preconceived ideas on the subject, while we maintain that in this country they may be grown in a cool, moist atmosphere as well, and even better than they have been grown in the high temperature they recommend. I contend that it matters but little what the natural temperature of their native habitats may be; if they succeed well with us here in a much cooler one so much the better. It is a great mistake to use fire heat when it is not required. In the first place it is unnatural even when mollified as much as is practicable by moisture. Secondly, it is a source of trouble, annoyance, and expense both to the gardener and his employer, and I am well satisfied that a great number of really beautiful Orchids will succeed perfectly well without any fire-heat at all during summer, while during the winter months its use may be reduced to a minimum, by carefully using covering material for the houses, as mats either of reeds, straw, or bark. I would not be understood as ignoring altogether the valuable information afforded us by collectors and travellers respecting the natural conditions in which plants grow abroad, since that knowledge guides us in our treatment to a certain extent, though it would not in all

cases be desirable, even were it possible, to follow out to the letter the natural conditions and surroundings under which the plants are found to exist or luxuriate, as the case may be, in their native habitats. For example, some of the Moulmein Dendrobes are scorched and shrivelled up during the dry season of the year ; but it does not follow that they are benefited thereby, any more than are our lawns and pastures by the scorching heat of our own summer season, added to a lack of moisture. In our artificial treatment of Orchids we can supply them with moisture in unlimited quantities, and we are able to keep a high temperature for those that require it ; but the third great essential is not so much at our disposal. I allude to light, which fortunately is not quite so essential for cool Orchids as for the Indian Dendrobes, Phalænopsids, &c. Lieut.-Colonel Benson tells us that the flowers produced on our Dendrobiums here at home are deficient in colour and brightness ; this no doubt is the result of our comparatively dull, cloudy atmosphere.

Another great requisite in the culture of all Orchids, more especially the cool section, is full and free ventilation, not only during the daytime but also through the night, of course taking precautions against cold draughts, by tacking coarse tiffany or perforated zinc over the openings. If ventilation is beneficial during the daytime, why not during the night ? I never could see the reason why plant-houses should be almost hermetically closed during night-time, and kept so close and hot as they generally are. A cool and airy night temperature is far more conducive to health and vigour than a hot and close one, more especially for Odontoglots, Oncids, and Orchids generally from the Mexican or Peruvian Andes. J. Bateman, Esq., years ago promulgated the system of cool treatment as being applicable to a great number of very beautiful and interesting Orchids, and in his own practice,

with one of the finest collections in the world, he demonstrated its usefulness, and gave an impetus to cool Orchid growing which is at present rapidly on the increase. Having visited many establishments where cool Orchids are grown, I must admit that I never found them the reverse of healthy, except where moisture was sparingly applied or a dry atmosphere maintained during the winter months. I would more particularly recommend imported *Odontoglossa*s, which happily are now imported in large quantities, to be potted and placed in a cool house, in order to start them into growth. If healthy strong pieces, they will start far better than in a hot temperature. Imported plants do not require so much water as established plants; still a moist atmosphere must be preserved, in order to prevent loss from the bulbs by evaporation. Carefully shade them from the bright sunshine, or evaporation will impair their energies, even if a humid atmosphere is maintained at the same time. This last remark is worth the attention of plant growers, its truth having been demonstrated by no less an authority than Dr. McNab, of the Cirencester College. I am well aware that respiration is essentially requisite, more especially in the case of strong vigorous plants, but to expose unrooted or sickly plants to the sun is the quickest and surest way of thoroughly sapping their life's blood, and can only end in extreme debility of constitution, from which they rarely again recover, and in some cases actually die. It may be argued that in the tropics certain species are fully exposed to the sun, and flourish in the most exposed positions best. This I would not deny, because I have elicited it from gentlemen of integrity, who themselves have gathered specimens of *Dendrobium*s, more especially of *D. formosum*, in like positions. Still in the tropics they are in a state of nature, with the air freely playing round them, and are not subjected to the inter-

vention of a glaring crystal roof and a close unhealthy atmosphere rendered arid by the dry and unnatural heat emanating from the hot water apparatus. It has been justly observed that "circumstances alter cases," and this is especially correct in the case in point, where on one side we have a plant in a state of unfettered, or rather, unperverted nature, and on the other, the same plant, perhaps, surrounded by a complicated series of artificial circumstances and conditions, between which a continual warfare is going on instead of perfect harmony and peaceful repose.

Again, we are frequently told that Orchids require houses to themselves, but really, in all truth, a greater or more absurd fallacy could not easily be promulgated. One would almost be led to infer from this that Orchids were exclusive, and occupied some particular portions of our globe, to the utter exclusion of all other vegetation. We can grow the Palms, Melastomads, Begonias, Ferns, and Peperomias in an ordinary plant stove, but the Orchids which have grown side by side with them in their native habitats must be placed in a structure called an "Orchid house" ere they can be expected to succeed in our gardens at home. There are hundreds of plant stoves in this country in which Orchids might be grown as well as in the best Orchid house ever made, were it not for the superstitious principles entertained by many on the above point.

It may be taken as a rule that wherever tropical Ferns and fine foliage plants succeed, there also Orchids, or at least many of them, would luxuriate, often with far greater chances of success than when placed in our so-called "Orchid houses," which, however desirable, are not absolutely essential to Orchid culture.

HINTS ON PURCHASING ORCHIDS.

IN buying Orchids, there are a few important questions to be considered. Some amateurs prefer to commence with established plants, and these are the best in the generality of places, more especially where no regular Orchid grower is employed; but where there is already a good established, healthy, blooming collection and a skilful and intelligent Orchid grower, a few good imported plants may be added from time to time, and they will not be found so difficult to establish as some would have us suppose. The truth is that there have been thousands of beautiful Orchids from the higher ranges of the South American continent or Northern India killed by being subjected to a high temperature and an arid unhealthy atmosphere. Orchids are naturally very tenacious of life, far more so than many Ericas and other hard-wooded plants, still hundreds are annually killed by being exposed to too much heat and far too little moisture. Hence we are often told that Orchids are very difficult to establish and expensive to manage afterwards. This is untrue, however, as far as cool Orchids are concerned. It is very well known that imported plants invariably make better established specimens in far less time than an old-established plant which has become debilitated by bad treatment.

There are many ways of buying Orchids, and we will just glance at one or two of these. Supposing that you know Orchids well, you may buy your own plants, being guided as to prices by any good Orchid catalogue. There are great advantages to be derived from buying in quantity, and special quotations for most of the Orchids in cultivation will be furnished on application to the principal nurserymen, who make these plants a speciality in their

establishments. Some growers, ever ready with objections, will say that dozens or half dozens are too many for them, two or three being all they require. To these I would recommend that they form a sort of association in conjunction with neighbouring cultivators, buying plants in quantity which can afterwards be equally divided, to suit all parties concerned. Still many cool Orchids should be grown in quantity in every collection, and if liberally treated will furnish a fine show of bloom for every month in the year. Indeed where *Odontoglossum Alexandræ* is grown in quantity, it alone may be had in flower all the year round, or with but little intermission. All who contemplate commencing Orchid growing should begin with the free-growing profuse-blooming species, and if these succeed and give satisfaction, which they assuredly will do if rationally treated, the newer and rarer kinds may be added as opportunities present themselves. The first commencement of nearly every Orchid collection is but a series of trials and experiments, and it is always best to experimentalise with the commoner plants rather than with the rarer, and consequently more valuable species. Many amateurs have a fancy for purchasing newly imported plants, and this can be done most weeks at the auction rooms. It is as well, however, to inform them that they will have to compete with the various nurserymen or their Orchid growers, men who have in the majority of cases an extensive knowledge and well matured experience of the plants they wish to buy.

There are always many additional attractions about imported and unbloomed plants, and a keen pleasure in watching their buds slowly expand, perhaps for the first time in Europe. Added to this there is always a possibility of obtaining some new or rare species or varieties amongst them. For example, C. Stead, Esq., of Baildon, and T. A. Titley, Esq., of Gledhow, Leeds, both fortunately obtained the chaste *Lycaste alba*

amongst imported lots of *L. Skinneri*. The delicate little *Cypripedium niveum* was bought as *C. concolor*, and the lovely *Phalænopsis Luddemanni* was sold for *P. (equestris) rosea*. The golden *Oncidium Marshallianum* was supposed to be the old and well-known *O. crispum*, until it flowered. Still it is "not all gold that glitters," and in trusting to habit and external characteristics one may be grievously disappointed, as when the dusky *Oncidium pubes* is obtained in mistake for the glorious *Oncidium (sarcodes) amictum*. The grandest of all Oncids, *O. macranthum*, closely resembles in external appearance several other species much inferior to it in beauty. Collectors would not be agreeably surprised were they to obtain plants of the dingy-flowered *Oncidium macropus* instead of *O. macranthum*; in habit the two species are identical. The same remark applies with nearly equal force to Reichenbach's striped Oncid (*O. zebrinum*). Dendrobies vary greatly in habit, according to the conditions under which they are grown. In the collection of Orchids at Fairfield, a plant of *D. Farmerii* had elongated bulbs, exactly like *D. densiflorum*, being from 12 to 15 inches long, and still, when received by them, it had the short, thick, quadrangular bulb, commonly met with in this species. *Dendrobium bigibbum* is a very rare and valuable kind, but the would-be possessors of this plant must not confound this and the dingy green and purple-flowered *D. brisbanensis*, a worthless species that resembles it very closely in habit.

Oncidium splendidum resembles the poor *O. microchilum*, and there are many other Orchids which closely resemble each other in habit, so much so that even experienced cultivators find a difficulty in distinguishing them even when in a healthy condition, much less when shrivelled after importation. *Schomburgkia crispa* and *Lælia superbians* are nearly identical in habit, while *Odontoglossum cordatum* and *O. macu-*

latum closely resemble each other in their foliage and pseudo bulbs. *Cypripedium caudatum* and *Uropedium Lindeni* are identical in habit, and but little difference exists between *Cattleya Skinneri* and the orange-flowered *Epidendrum aurantiacum*. Some forms of *Dendrobium Pierardi* very nearly resemble plants of the elegant *D. Devonianum*, more especially when denuded of their foliage, as is generally the case after importation. The pseudo bulbs of *Odontoglossum Pescatorei* somewhat resemble those of *O. triumphans*, but in this case but little disappointment will follow if a mistake is made, since both are beautiful. *Cattleya labiata* and *C. Warneri* are much the same in habit, as, indeed, are all the numerous forms of this beautiful group.

After a little study and close habits of observation, the distinctive appearances of Orchids will be fixed in the eye and mind, although even the most experienced are occasionally deceived in their external characteristics, which, as a matter of course, are liable to much variation according to the different local surroundings to which they have been exposed in their native habitats. There is always a possibility, as before stated, of obtaining new or rare varieties, and the chances are much more in favour of this occurring when, as is frequently the case, the collector does not see all the plants in bloom. Of course when they are collected by resident botanists, they are in most cases found to be correctly named on their arrival in this country, and are then sold as named plants. Imported plants are sold by most of the principal Orchid growing nurserymen at rates considerably lower than those demanded for established plants. More pleasure will be derived from growing the cooler Orchids, in proportion to the capital expended, than can possibly be obtained by cultivating the far more expensive species from the tropical lowlands. Many of the finer species may now be obtained at prices scarcely above those of the

better class stove and greenhouse plants, while their cultivation does not cost more than that of ordinary greenhouse plants. We find that gentlemen become so annoyed at seeing their plants in bad condition that they refuse to purchase new or rare kinds, and in many cases give up Orchid growing altogether, simply because they have been unfortunate in the choice of men to grow them. Only give Orchids rational treatment, with plenty of moisture both at the roots and in the atmosphere, and you will not have to complain of their being difficult to manage. Orchids are the most difficult plants to kill, judging from the diverse systems of treatment to which they are subjected; yet for perfect success they must, from their first introduction, be subjected to a course of good culture, and then, instead of flaccid foliage and shrivelled pseudo-bulbs, we shall have sturdy health, followed by an abundant crop of large and finely-formed flowers. It is impossible to kill Orchids by having too much moisture in the atmosphere, though many hundreds are annually killed by keeping the atmosphere in which they are grown too dry. Never try experiments with valuable Orchids; follow the accepted treatment with these, and experiment—if experiment you must—with common and cheap kinds.

POTTING AND WATERING ORCHIDS.

THESE are important operations, and, in conjunction with atmospheric moisture, must be considered to be the foundation of Orchid cultivation. Carbonic acid gas is always liberated in more or less quantities by decomposing vegetable substances, and this gas, together with ammonia in small quantities, is very beneficial, indeed actually essential to the growth and vigour of growing plants of all kinds. It is a notable fact that most cool Orchids grow best in decaying vegetable matter. More especially does this remark apply to such Orchids as



Layer of Sphagnum.

Small Crocks.

Large Crocks.

Orchid Pot, drained and ready for compost.

Odontoglossums and Masdevallias. Most of the Cypripediums will grow in turfy loam, but the more fibre it contains the better they will grow, a fact which conclusively proves that they derive their nutriment more from the decaying vegetable matter contained in it than from the mineral or earthy constituents of the compost. Again, every cultivator knows how vigorously the old Cypripedium insigne and *C. barbatum* and its varieties grow in peat, sand, and dried cow-dung, and this

is nearly exclusively a compost of decayed vegetation. The sand of course contributes nothing of a nutritive character to the plant, but it keeps the compost in a porous condition. While speaking of sand I would recommend that great care be taken in its selection, for some of the sand obtained in limestone districts is injurious, on account of the quantity of lime which it contains. Sand should be carefully washed, and if the water becomes milky it should not be employed, as in that case it would do more harm than good. In potting Orchids perfect cleanliness should be observed, not only as regards the pots themselves, but also with respect to the drainage, or "crocks," which should be carefully and thoroughly washed and dried previous to their being used. For *Odontoglots*, *Oncids*, and *Masdevallias*, the pots should be at least half full, or rather more than less, of crocks, a layer of very small ones being placed on the top of the larger pieces, to prevent the compost from being washed down, and thus preventing the superfluous water from passing away freely.

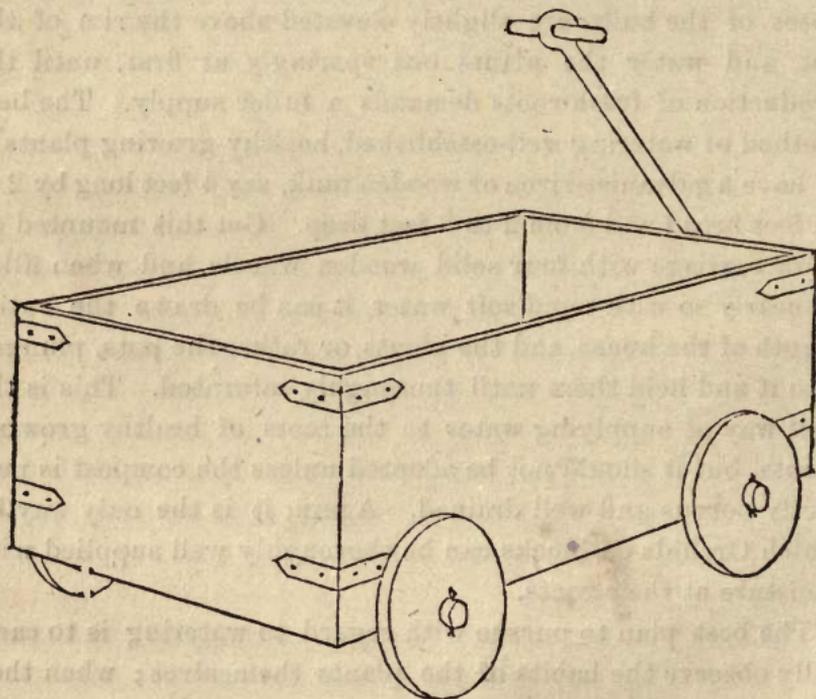
The compost itself should consist of really good and fresh fibrous peat, to which may be added about one-fourth of well dried horse-droppings, a little chopped living sphagnum, and a few broken crocks, adding a sufficient quantity of coarse well-washed river sand, ordinary white sand being generally too fine for this purpose. This compost is the best that can be used for the majority of cool Orchids, and if placed on good drainage will be found to hold water only by absorption, as it were, or by capillary attraction. This is the principle on which all Orchids should be grown. There must be no obstruction to the free riddance of superfluous moisture, or the compost will quickly become sour, and then the roots will decay. It has been repeatedly observed that cool Orchids, more especially *Odontoglots*, can never be supplied with too much water at the root when growing, provided the compost is fresh

and open, and that the drainage is perfect. The same remark applies to the glorious terrestrial Cape Orchid, *Disa grandiflora*. This, in addition to a liberal supply of moisture at the roots, should be syringed several times daily when in full growth; it should be kept in a very cool house or pit, and in a shady position. When the pot has been drained place a thin layer of sphagnum, the best you have, over the drainage, and upon this put the compost. Carefully spread out the roots and pack firmly with the compost, but use caution, and do not crush or bruise them, or they will decay. See that the bases of the bulbs are slightly elevated above the rim of the pot, and water the plants but sparingly at first, until the production of fresh roots demands a fuller supply. The best method of watering well-established, healthy-growing plants is to have a galvanised iron or wooden tank, say 4 feet long by 2 or 2½ feet broad and from 2 to 3 feet deep. Get this mounted on a low carriage with four solid wooden wheels, and when filled or nearly so with tepid soft water, it can be drawn the entire length of the house, and the plants, or rather the pots, plunged into it and held there until thoroughly saturated. This is the best way of supplying water to the roots of healthy growing plants, but it should not be adopted unless the compost is perfectly porous and well drained. Again, it is the only way by which Orchids on blocks can be thoroughly well supplied with moisture at their roots.

The best plan to pursue with regard to watering is to carefully observe the habits of the plants themselves; when they evince a tendency to stop growing, or to rest, water should be gradually withheld, only giving just enough to prevent shrivelling. When they commence to grow, and to produce roots, they should be encouraged by the application of more moisture, both at the roots and in the atmosphere, no matter at what period of the year this may occur. If the moisture

has been reduced in consequence of most of the species contained in the house being at rest, and if one or two species that require extra heat, except when at rest, commence to grow, they should be removed to a more humid atmosphere, as, for instance, a moderately warm greenhouse or intermediate house, where they should be suspended, or staged as near to the glass, *i.e.*, light, as possible, for during the dull period of the year they require all the light they can possibly obtain.

All Orchids require an abundant supply of moisture and a fresh, porous, well-drained compost, and many of them, if



Moveable Water Tank.

favoured with these essential conditions, will not only bear without injury a mean winter temperature of 45° to 50° , but will actually make most vigorous and luxuriant growth in that comparatively low temperature.

RESTING ORCHIDS.

EVERY person acquainted with this class of plants will readily admit that, as a rule, rest is essential to their successful cultivation. There is, however, a great difference in the duration as well as in the manner of resting the different species of Orchids which we have now in cultivation. In their native habitats they are materially influenced by the various atmospheric conditions in which they are for the time being placed. Take, for example, our own native terrestrial Orchids—*Listera* and *Habenaria*. During winter, they are silently resting beneath the surface of the earth; but though resting, they are, as a matter of course, liberally supplied with moisture. In a manner analogous to this, the glorious South African *Disa grandiflora* is partially or entirely submerged during its period of repose; and when cultivating it here at home we find it necessary to keep it in a state of moisture nearly the whole year round. On the other hand, we find many Indian Orchids—terrestrial ones—as *Cypripedium concolor*, *Phalænopsis Lowii*, and others that rest during the hot and dry period of the year, and only commence their growth with the rainy season. Indeed, the *Phalænopsis* alluded to is often dried off, and becomes deciduous, on its native rocks in Moulmein. In cultivation, however, it is inadvisable to subject it to such treatment, and, as it retains its foliage throughout the year, its rest with us is far less decided. Again, *Calanthes*—or rather *Preptanthes*—may be kept comparatively dry for three months without doing them any material injury. On the other hand, some of the cooler-growing Oncids and Odontoglots, as *Oncidium macranthum*, *O. serratum* (*diadema*), *Odontoglossum Alexandræ*, *O. Uro-Skinneri*, and many other species require but little rest; indeed, with these

the period of repose is reduced to a minimum, as they persist, if left to themselves, in growing and flowering all the year round. More especially is this habit shown when the plants are grown in a cool, airy, and moist atmosphere. Cattleyas and some of their congeners, the *Lælias*, exhibit the same tendency to keep on making a perpetual growth, more especially if supplied with air and moisture, added to a moderately cool temperature of, say, 50° to 55° at night. Still it must be allowed that a periodical season of repose is more essential to insure the profuse production of flowers on these plants than it is in the case of the *Oncids* and *Odontoglots* before mentioned. There is, however, another way of resting Orchids, and one which is apt to be overlooked, though a fact of the greatest importance. Sickly plants should on no account be allowed to produce flowers, it being far more essential that they should be induced, as far as possible, to produce leaves, pseudo-bulbs, and roots. Some of the very finest *Phalænopsids* in this country may be found at places in which they are allowed to produce but one crop of flowers annually, and even under this treatment their young flower-spikes are judiciously thinned out, so as to leave the one or two remaining to be of the finest quality. Fine plants are often found in places where they cut nearly every flower-spike as its blooms expand. As an illustration of this, I may point to one of the finest collections of "cool Orchids" in Europe, that of Mr. E. Salt, at Ferniehurst, near Leeds; there scores of fine spikes are cut off the plants as soon as their flowers fully expand. This systematic process of removing the flowers relieves, or, in other words, rests the plants operated on much more than is generally supposed. It induces an energetic propensity for making fine and vigorous growths, and well-ripened, plump, pseudo bulbs, and hence the plants are far better able to produce an abundant crop of fine

spikes and well-formed flowers the year following than they otherwise would be. The mere production of flowers alone, however, requires barely half the constitutional energy which is requisite to produce both flowers and perfect fruit, and therefore, but few Orchids in cultivation, comparatively speaking, are capable of producing perfect seed, even when assisted by artificial means. How different is the case in their native habitats! In fertile tropical regions they luxuriate with a vigour unknown to us here, and in many cases produce abundance of seeds, which, ripened in the genial light, heat, and air of a tropical climate, eventually become scattered on the trunks, stems, and branches of trees, where they germinate in countless hundreds, and thus fill up the deficiencies created by naturalists and collectors.

When at rest, Orchids should not be kept in a hot and dry temperature, or it will be found that they will suffer materially from evaporation. How often do we see many rare and valuable species "resting," as it is termed, in the full blazing sun, under a glaring crystal roof, and surrounded by a parched atmosphere? Day by day their pseudo-bulbs become more wrinkled, their leaves more like brown paper, and yet this pernicious system of treatment is called "rest." True rest would never rob the pseudo-bulbs of a large proportion of the sap, or elaborated juice, which had been secreted during the preceding season's growth. It is not rest which leaves them in a sickly, debilitated condition, too much exhausted to produce either growth or bloom.

Another erroneous impression is, that all Orchids require to be rested during our winter season, or, if not actually rested, kept much drier than during the summer months. This rule, though applicable to some Orchids, must not by any means be applied indiscriminately to all, since we have many *Odontoglots*, *Oncids*, *Dendrobes*, *Disas*, and *Masdevallias*, to

say nothing of many species belonging to other genera, which commence their growth during our autumn and winter months. To attempt to rest such as do this, or to withhold a sufficiency of moisture either in the atmosphere or at the root, cannot possibly conduce to useful results, but, on the contrary, would do the plants permanent injury. The best results are invariably obtained by cultivators who are ever watchful and careful to assist Nature's efforts, and who are equally cautious never to thwart her in her workings, knowing, as they do, that she is invariably the best, and, in some cases, the only reliable guide to success. The cultivator who would succeed with Orchids, more especially with such as are grown in the high temperature of the East Indian house, should be careful to supply an abundance of moisture to the atmosphere of the house during dry, sharp, frosty weather. This may sound absurd to some, but the reason for recommending this course of treatment is obvious. During frosty weather, as a rule, the atmosphere is drier than at any other time, not even excepting the hot days of summer; and in addition to this unnatural dryness, which a glance at the hygrometer will prove, the hot-water pipes are generally scorching hot; add to these two unnatural conditions the careful use of water so often advised during winter, and one need not wonder at *Vandas* and *Aerides* becoming parched and shrivelled until they look more like leather thongs than what they ought to be if rationally treated. Again, how often are we told that Orchids when in bloom should be removed into a cool and dry temperature, in order that they may last longer in beauty. Do they last longer in perfection in a cool and dry atmosphere than they would in a cool and moderately moist atmosphere? I have found the latter to be most favourable to the preservation of flowers, and which I am fully convinced, from experiments with cool *Odontoglossa* and *Oncids*, will be found

to be the case generally. In a dry atmosphere, flowers, as well as bulbs and foliage, continually suffer from excessive evaporation, a state of things we should endeavour to avoid as much as possible.

A careful and observant cultivator quickly detects by external appearance when any individual plant is about to rest, and then acts accordingly, only supplying just enough moisture to the roots and in the atmosphere to prevent the plant from losing its concentrated energies by means of evaporation. This much must be supplied or the plant will suffer far more than it would from being furnished with too much moisture, although more than will prevent the bulbs and leaves from shrivelling is decidedly injurious to plants when at rest.

SPECIFIC VARIATION AMONG ORCHIDS.

WE may search through the entire vegetable kingdom and find but few classes of plants that vary more than Orchids do, so far as depth and richness of colouring and the relative size and shape of the flowers themselves are concerned. They also vary greatly in regard to constitutional vigour, as may be proved by growing a batch of newly imported plants of the same species under precisely the same conditions, when it will invariably be found that some grow much more vigorously than others, although there were no external signs of superiority to be detected amongst them, even by the most experienced grower, when they were first potted. As a striking illustration of their variability, I may cite the lovely winter-flowering *Lycaste Skinneri*, which varies in colour from the purest white to a very deep rosy variety, having a deep crimson lip; and this variability is equally apparent in other species belonging to different genera, which run from the typical form into the most distinct and beautiful of varieties imaginable. *Cattleyas* are notorious for their protean variability, while the chaste *Odontoglossum (crispum) Alexandræ*—that queen of *Odontoglots*—is extremely variable in the size and colouring of its blossoms. *Phalænopsis grandiflora* exists in many different forms in our collections, several of which are well marked and distinct, not only in the breadth of their sepals, the depth and diffusion of the yellow colour on the lips, but also in the length and breadth of their leaves, as well as in constitutional vigour. The same remarks apply to several other species, as *P. Luddemanniana*, *P. amabilis*, and *P. Schilleriana*; the latter has the most robust constitution of any species in this truly superb genus, and it is the only species that will subject itself to cool treat-

ment. I would here remark that the mere mention of the breadth of a flower gives no substantial proof of its being a first-class variety, since many long-petalled flimsy flowers measure a good deal across, but are comparatively worthless, since they lack breadth and substance in their sepals and petals.

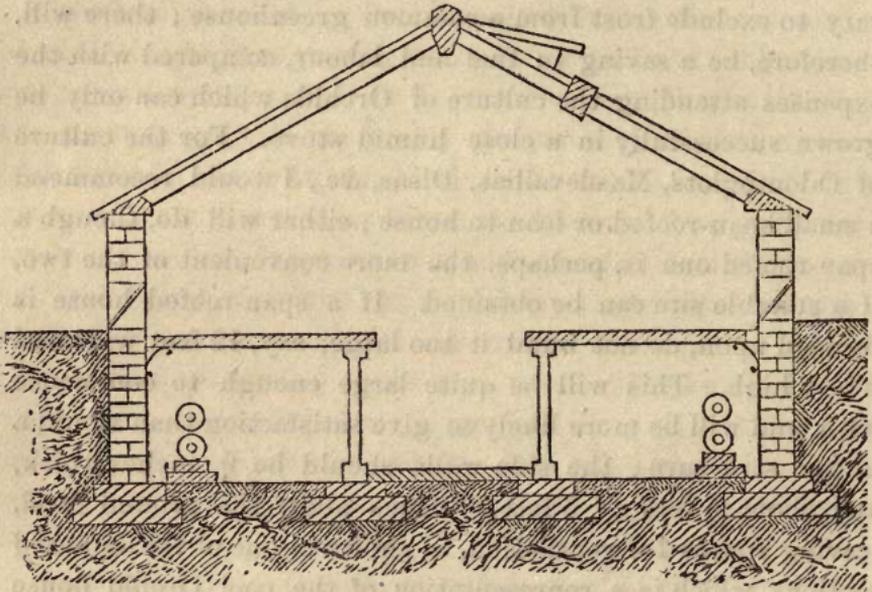
In one of the finest collections of *Phalænopsids* in this country there are some twenty or thirty imported plants, which vary greatly in breadth of petal and substance. Hence it becomes apparent that when we purchase Orchids, we should be careful to select as good varieties of them as possible. There are some Orchids, too, which vary greatly, not only as has just been related, but also in the length and thickness of their pseudo-bulbs, and in their flowering propensities. For an example of this, take *Lælia majalis*—the Flor de Maio of the Mexican Spaniards—of which there are two distinct varieties, differing in the length of their pseudo-bulbs. The short-bulbed variety blooms with tolerable regularity, while the other may be grown on for years without its ever producing a single flower. Mr. James Anderson, gardener to F. Dawson, Esq., of Meadowbank, has succeeded in flowering this species regularly during these last few years. It will thus be seen that “good varieties” are those which bloom freely, and that produce large, richly coloured flowers of good substance. What, it may be asked, causes this striking divergence from the normal types in different species? We can only account for diversity in colour, size, form, and constitution by the fact that in their native habitats, where several species bloom in close proximity simultaneously, they are exposed to the fertilising agency of insects, and being reproduced from seed it follows that some proportion, if not all the seedlings, vary as has just been stated. Everyone who has raised seedlings of any class of plants will understand that

they are apt to differ from the parent plant; more especially is this the case when these varieties are again cross-fertilised, producing other plants even more diverse than themselves. I willingly allow that local circumstances and conditions affect plants, and cause variety in individuals to a certain extent, when they exist under different surrounding influences, but the great bulk of our best varieties owe their beauty to cross-breeding, as effected by insect agency. We are well aware that nearly all the seedling Orchids raised in this country, with the exception of *Disa grandiflora* and *Cypripedium Schlimmii*, have proved on flowering to be more or less distinct from their parents, and this is a pretty conclusive proof that cross-fertilisation in their native habitats is the origination of all the beautiful varieties introduced from the tropics. This extreme variability in Orchidaceous plants adds an additional charm to their cultivation, for with what unfeigned anxiety does the amateur or professional cultivator watch an imported plant showing its flower-spike for the first time! How carefully he compares its pseudo bulbs or foliage with those of its relatives, and if its external habit of growth does not betray him, if it really is a new species, or an extraordinary variety, with what genuine pleasure does he watch the delicate stranger unfold its floral treasures. Seeing, therefore, that Orchids vary so much in a wild state, and even under cultivation, need it be wondered at that portraits of such plants vary? The difference that exists between representations of the same plant in different books has often been a matter of complaint; but the disparity in question is not by any means greater than may be found to exist in the different varieties of the plants themselves, from which the drawings were originally made.

COOL ORCHID HOUSES.

A FEW words concerning these may be of service to those who are about to begin to grow cool Orchids, and have no special convenience for doing so. In the first place, no very elaborate or expensive structure is required, and no costly heating apparatus is requisite beyond the amount of hot-water pipe necessary to exclude frost from a common greenhouse; there will, therefore, be a saving in fuel and labour, compared with the expenses attending the culture of Orchids which can only be grown successfully in a close humid stove. For the culture of *Odontoglossa*, *Masdevallia*, *Disa*, &c., I would recommend a small span-roofed or lean-to house; either will do, though a span-roofed one is, perhaps, the more convenient of the two, if a suitable site can be obtained. If a span-roofed house is decided upon, do not build it too large, say, 12 feet wide and 8 feet high. This will be quite large enough to commence with, and will be more likely to give satisfaction than would a larger structure; the side walls should be 9 inches thick, and about 5 feet or 5 feet 6 inches above the ground level, leaving spaces for ventilation, as shown in one of the annexed sections, which is a representation of the cool Orchid house at Ferniehurst. Top ventilation should also be amply provided for by a longitudinal flap (as shown in the illustrations), which can easily be raised from the inside. The ventilators in the side walls may be closed by means of wooden slides outside. A house of this description of the simplest construction, heated efficiently, as shown, by a flow and return 4-inch pipe on each side, may be erected at very little cost. It can be constructed of any length; one from 60 feet to 70 feet would be large enough for a good-sized collection, and this length might very advantageously be divided in the middle

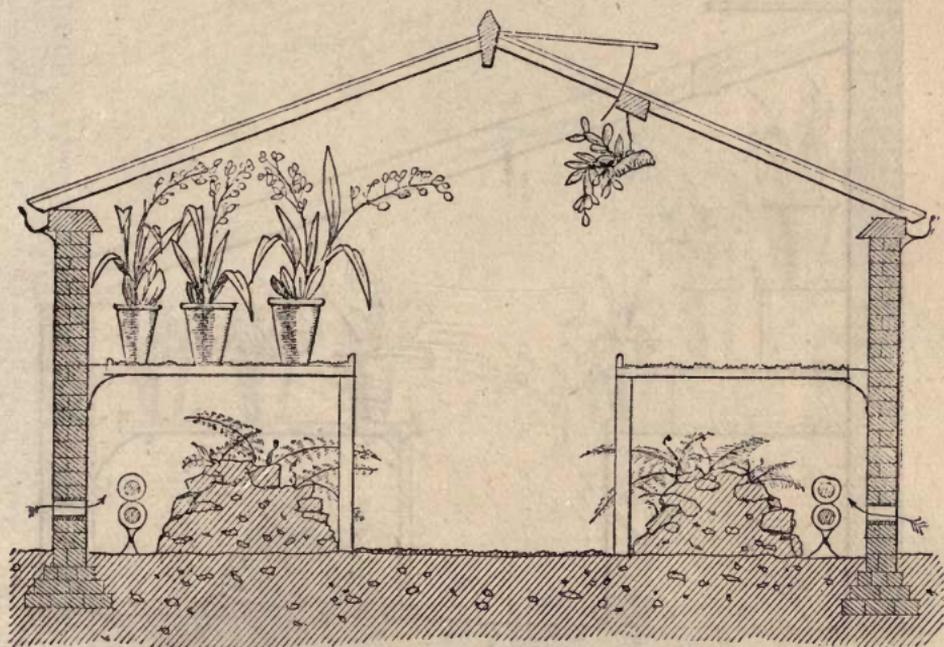
by a glass partition and door, so as to allow of one compartment being kept rather warmer or drier than the other, as might be required. The staging or side benches will be about 4 feet wide and about 4 feet high, or one compartment might have the benches 3 feet high, so as to give more head room to larger plants. These benches should be either stone or slate slabs placed upon cast-iron supports. Iron is better than wood, which will naturally



Span Roofed Cool Orchid House, partly below ground.

decay quickly in a humid atmosphere, and might give way suddenly, causing sad damage. This really happened in the case of a celebrated collection near Manchester not long ago, and did very serious damage to some of the finest *Phalænopsis* in this country. In the centre of the house a cistern may be constructed, into which all the rain-water from the roof might be conducted for use inside. As has been already explained, moisture is essential to the well-being of all Orchids, and as bare slate benches speedily become dry after

having been watered or damped down, it is a good plan in practice to cover them with a thin layer of cannel coal, broken up small and carefully washed. In addition to this, the benches may also be made to hold water, which, during the hot summer months, will be highly conducive to the health and vigour of the plants. The space bordering on the path beneath the side benches may be planted with *Selaginella hortensis*, which will soon form a fresh green carpet and

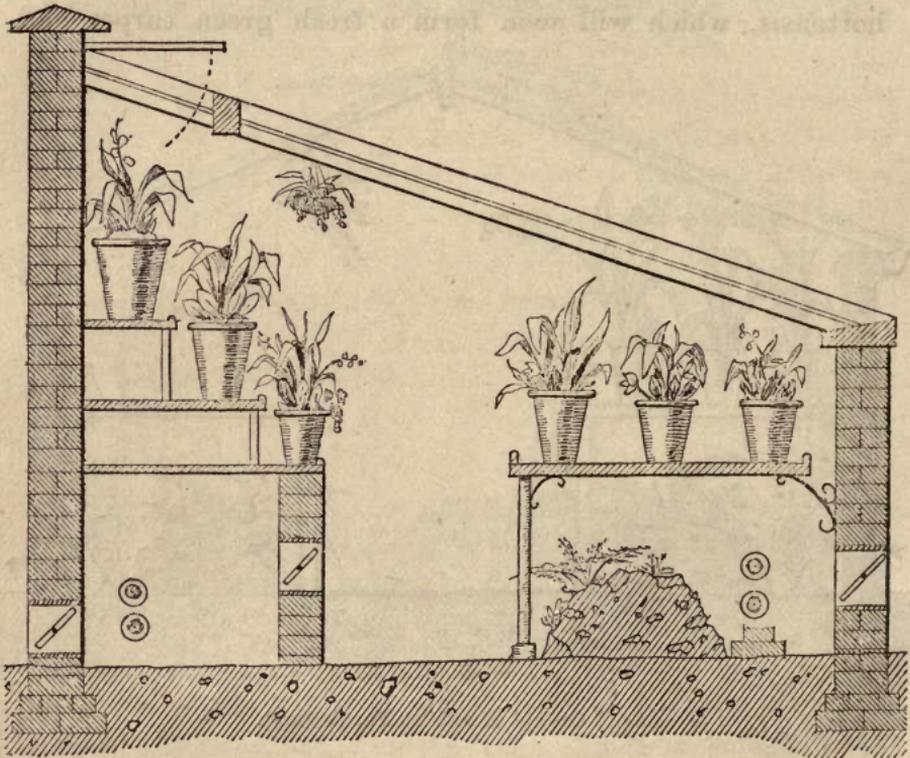


Cool Orchid House at Ferniehurst.

materially aid in giving a neat and clean finish to the house; or a few Ferns may be planted, as shown in the illustration. During the hot summer months the plants will require to be carefully protected from the sun's rays, and blinds on rollers should be provided for that purpose. In order to prevent cold draughts from injuring the plants, it is a good plan to cover the ventilators either with perforated sheets of zinc or

else to tack pieces of coarse tiffany over the openings inside the house.

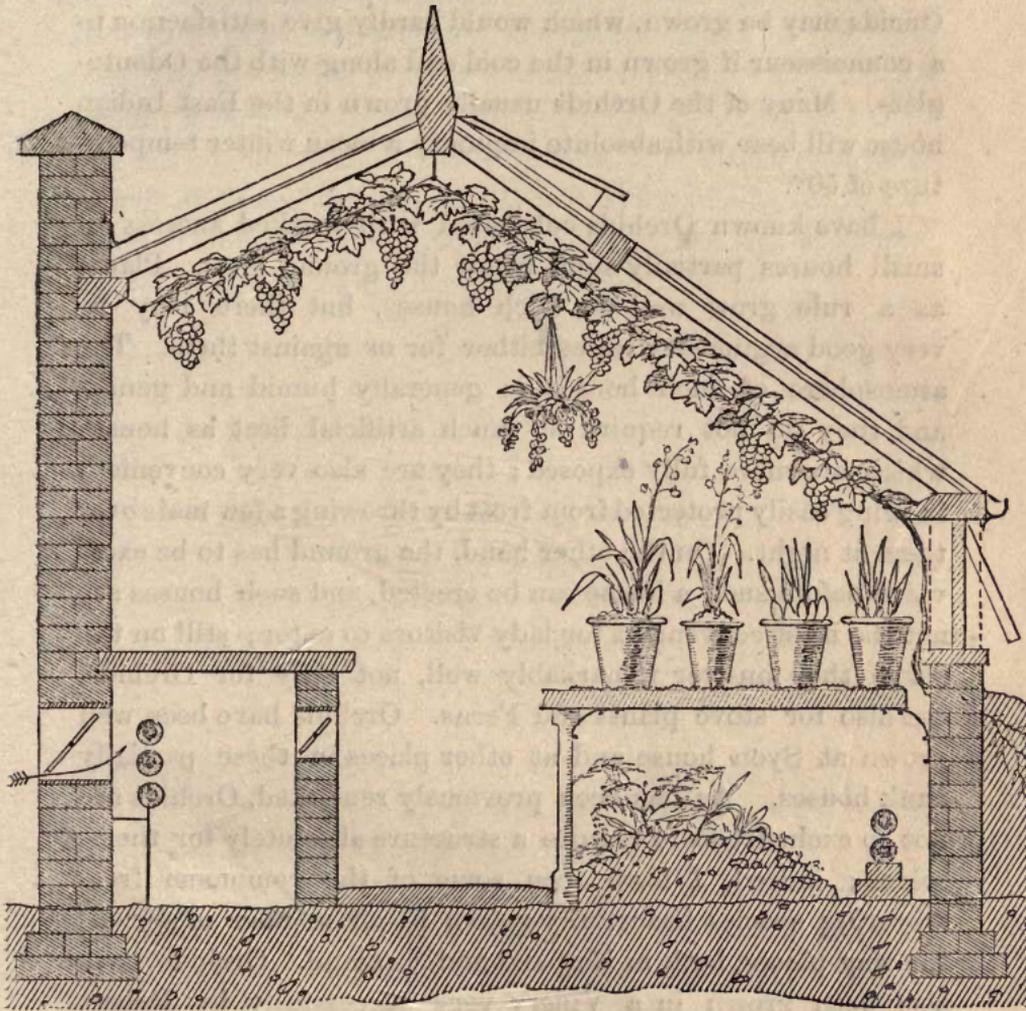
These and many more little details will, however, soon suggest themselves to the mind of the attentive cultivator, who must be ever ready to counteract any unhealthy symptoms which his plants may show through being subjected to a course of adverse circumstances. The construction of



Section of a Lean-to Orchid House.

cool Orchid houses does not call for any great amount of skill; they may, therefore, be erected under the direction of any intelligent workman who may happen to be about the place, in a few weeks at most, and their first cost will be but a trifle compared with the pleasure the culture of these lovely plants will afford.

Although some Orchids grow freely in a cool house or compartment which is kept at a mean winter temperature of 45° , still there are other species that require a temperature 8° or 10° warmer, in order to grow them successfully. They would



Section of House adapted for Vines and Orchids.

both thrive and bloom in the cooler house, but not with that luxuriant vigour which true lovers of Orchids delight to see. If a house, say 60 feet long, is built, it should be divided in the

middle; this gives two compartments of 30 feet each, and one of these may be kept warmer than the other by the addition of an extra row of pipes, one flow and return. In this warm end many Cattleyas, Lælias, Trichopilias, Cypripediums, and Oncids may be grown, which would hardly give satisfaction to a connoisseur if grown in the cool end along with the Odontoglots. Many of the Orchids usually grown in the East Indian house will bear with absolute impunity a mean winter temperature of 50°.

I have known Orchids cultivated with marked success in small houses partially sunk below the ground level. Plants as a rule grow well in such houses, but there may be very good arguments raised either for or against them. The atmosphere of such houses is generally humid and genial, and they do not require so much artificial heat as houses which are more fully exposed; they are also very convenient in being easily protected from frost by throwing a few mats over them at night. On the other hand, the ground has to be excavated before such a house can be erected, and such houses are not the most convenient for lady visitors to enter; still on the whole they answer remarkably well, not only for Orchids, but also for stove plants and Ferns. Orchids have been well grown at Syon house and at other places in these partially sunk houses. As has been previously remarked, Orchids are not so exclusive as to require a structure absolutely for themselves; indeed, I have seen some of the commoner free-flowering species beautifully grown in all manner of out-of-the-way places, both in England and Scotland. Orchids have also been grown in a Vinery very successfully by Robert Warner, Esq., of Broomfield, and others. The partial shade of the Vines and the moist genial atmosphere are highly conducive to the healthy vigour of many Dendrobes, Lycastes, Anguloas, and Odontoglots, and the crop of Grapes is a very

agreeable secondary consideration. Mr. Warner has more than once advised the association of Orchids and Vines, and he moreover very truly asserts that "there are few Orchids worth growing which might not be cultivated under Vines." I know from experience that many choice Dendrobis make a vigorous growth in the genial heat of a warm vinery in which bright sunlight is subdued by the fresh green foliage above, and this is equally true of many other genera. The accompanying sections of houses (see pp. 30, 31) will be found adapted to the culture of Orchids under different conditions, and similar houses may be erected at a very moderate outlay.

ORCHID HOUSES IN THE NATURAL STYLE.

THE frontispiece shows an Orchid house in the natural style and gives some idea of the beauty and grace of that fine tribe of plants when judiciously arranged. Still, however beautiful houses arranged in this manner may be made to appear, from an æsthetic point of view I can scarcely hope for their general adoption at present, though even the most enthusiastic admirer of Orchids must admit that our Orchid houses, as at present arranged, are not generally noted for any special beauty or elegance, in any other than a floral sense. Indeed, when the generality of Orchidaceous plants are out of flower, they do not give a tithe of the pleasure that an ordinary observer would derive from a collection of the commonest Ferns or Succulent plants. To the professional Orchid grower or enthusiastic amateur, there is a certain attractive beauty in the strong growths, fresh foliage, or plump pseudo-bulbs, but an ordinary visitor overlooks these minute details, the general effect of the whole only being taken into consideration. Some Orchids, however, have a graceful habit, as *Aerides*, *Vandas*, and a few others, but in general they are unattractive when not in bloom. We get a step nearer to natural arrangement, and see a little more of its beauty when we group gracefully-habited Ferns and Palms along with our Orchids. As I have before pointed out, Orchids grow luxuriantly in their native habitats in close contiguity with Ferns, *Melastomads*, Grasses, and Palms, and it is possible to follow nature to a certain extent in the way of natural arrangement here in our Orchid houses at home. I am quite well aware of the practical difficulties that present themselves to our notice, and know that these in some cases are amply sufficient to preclude the possibility of the natural system being attempted, but there are

cases in which this plan may be followed out judiciously, and with the best possible results. Terrestrial Orchids in pots are portable, and more convenient for many reasons than when planted out, though I very much doubt whether they ever grow so luxuriantly as they would if planted out in a suitable structure. In a state of nature Orchids grow with a wild luxuriance quite unknown to us, their aerial roots extending in all directions in quest of food and moisture; and they would grow more vigorously in our plant houses if planted out in suitable composts, though, as a matter of course, this plan could only be adopted in places where there was no probability of their having to be removed. All Orchids are not adapted for planting out, but there are some that are specially amenable to this course of treatment; and in this respect cultivators should be judicious, only selecting such plants as are likely to succeed and give satisfaction. There are several beautiful Ferneries arranged in the natural style in this country, with fountains and little trickling brooks bordered by moist banks of sphagnum and turf, and to these the addition of a few Orchids would be a marked improvement. A moist, spongy bank partially shaded in such a structure would be just the situation in which to plant out the glorious *Disa grandiflora*, and to grow it in perfection. It has grown and flowered out-of-doors during the summer months in this country, but the chances of success would be far greater under the above conditions than when subjected to either the vicissitudes of our climate or to having its eager roots cramped within the circumference of an earthenware pan. Give it a chance on one of these moist banks, where its roots can ramify in all directions, and its fresh vigorous foliage will bid defiance to thrip or red spider, and it will form an object of beauty not easily excelled. There are other terrestrial Orchids admirably adapted for planting out, such as the evergreen *Calanthes*,

Phajus and Sobralias. Phajus grandifolius and P. Wallichii would soon establish themselves and make noble specimens, being gross feeders and very abundant bloomers. The golden-flowered *Cyrtopera flava* and many other terrestrial Orchids from India, South America, and the Cape, might be grown in perfection if planted out in suitable situations, since it is almost impossible to do justice to them when grown in pots. Our frontispiece, which represents an Orchid-house arranged in a picturesque manner, shows what the idea is when properly carried out. The pipe carrying the water for the cascade passes round the boiler. The plants have a graceful appearance, and the *tout ensemble* is considerably heightened by the little cascade tumbling from the partly hidden rockwork. It is easy to recognise such plants as *Peristeria elata* (Dove plant), some species of *Oncidium* and *Cycnoches Loddigesii* in the foreground, while *Cœlia macrostachya*, *Scuticaria Steelii*, *Renanthera coccinea*, *Vanilla planifolia*, and a *Stanhopea* or two complete the group. The water below might have been utilized by the culture of some of the smaller *Nymphæas*, or other aquatic plants. In houses of this kind suitable openings could be left in the rockwork, so as to introduce pots containing flowering plants as they come into bloom; and by adopting this system, a naturally arranged house might always be kept gay with choice exotics, while Ferns, Selaginellas, and Mosses, together with a few trailing plants, would form an appropriate background to the delicate colours of the fragrant flowers.

IMPORTING ORCHIDS.

HAVING been repeatedly questioned in reference to this important subject, perhaps a brief allusion to it here may not be out of place, more especially as it is generally acknowledged that there is much to do in this way ere even our great collections approach completeness. We are moderately rich in epiphytal species, but terrestrial Orchids are but poorly represented, even in our best public and private collections, and will no doubt continue to be so until private enterprise clears the way to their introduction to this country. There are many localities where an enterprising collector might do well. The vegetation of Central Africa is as yet comparatively unknown, though not unheard of, and even the plants of the southern or Cape district, including some of the finest terrestrial Orchids that could be grown, are as yet unknown to cultivators. The Orchids of Upper and Lower Assam, not to mention those of other parts of the great continent of India, are in the main unknown to cultivators. Suddyah in Upper Assam is a rich locality for new or rare plants, which grow profusely in the neighbouring mountains. It is difficult for any European to enter these mountain gorges, as the wild tribes object to this; they, however, allow natives to enter, and they will bring down both flowers and plants, or both, for a mere trifle. These tribes, the Mishmeys and Nagahs, come down to Suddyah and Debroghan to trade during the winter season, and return during the warm season to their hills. An officer lately in the Bengal army has kindly supplied me with his experience of various parts of India, and mentions many lovely Lilies, Primulas, Rhododendrons, and Ferns which he has met with in profusion whilst hunting and shooting in the mountains, but which he has never seen in cultivation. A

collector going out to India should understand something of the language, or else make up his mind to take into his employ a native who understands some English, or innumerable difficulties will be thrown in his way. Many persons in this country have resident correspondents in India, who could in some favourable instances send over a case or two of choice Orchids. Plants that are known to grow in any special locality may be obtained by giving the native tribes graphic coloured drawings of them, and offering a certain small sum to the first who succeeds in bringing them from the hills. In addition to the plants mentioned above, different species of Iris, Myosotis, Delphinium, and Fritillarias were noticed in the vicinity of Panchoa. Panchoa is a small village near to the Oontadoora Pass, at an elevation of nearly 17,500 feet. The Orchids do not reach that elevation, but many herbaceous plants scarcely less beautiful or interesting might be obtained from that locality. Many parts of the Himalayan range might be thoroughly well investigated, with both pleasure and profit, by any well-qualified collector.

Collecting plants, however, is but half the duty of a collector, for if great care is not taken in packing and transporting them, there is every probability of their being lost on their journey to this country. If possible Orchids and bulbs should be packed when at rest, or during the dry season. Packed tightly in a common packing case, among dry fibre or shavings, at that season they generally reach this country in good condition. If the plants are growing, it becomes necessary to pack them more carefully in a glass-roofed plant-case, allowing the growths plenty of room. It is of but little use to crowd growing plants together in a case, for if one commences to decay the evil soon spreads, and a mass of stagnant rotteness is the result. A few robust plants carefully packed have a much greater chance of reaching this country in excellent

condition than great numbers closely huddled together. In the case of some epiphytal Orchids, it is possible to obtain them thoroughly well established by lopping off the branches of the trees on which they grow. The logs so obtained can afterwards be trimmed, and if nailed or screwed firmly to the sides of the cases in which they are to be sent home, there need be but little fear of their reaching their destination in safety. *Phalænopsis Parishii* and *P. grandiflora* packed in this manner have often arrived in excellent condition.

In sending Orchids to this country from abroad, care should be taken to ship them so that they will reach here during warm weather. Inattention to this has disappointed many, when the only cause for failure was their having been shipped off too late in the season, and their having reached this country during the winter months. The rigour of our northern winters has ruined the contents of scores of cases of valuable plants, often after a large amount of both capital and labour had been expended to collect them in their native habitats. In the case of glass-roofed cases, it is a good plan to make arrangements, if possible, with the captain or other officer of the steamer on which they are placed, to have them shaded during bright sunshine. These little details will soon suggest themselves to the collector, but it is as well to know and prepare against any adverse circumstances that may render the importation of living Orchids less certain than it is at present. Many bulbs, and the tubers of many terrestrial Orchids, are best brought or sent over when at rest, packed in their native earth. Many seeds of Palms and other tropical plants and shrubs are best sent over packed in moist clay or earth, as dryness is certain death to them. There are many seeds that will keep for years in a dry place without their vitality becoming impaired; but there are others, as the *Amherstia nobilis* for example, that cannot be imported or

preserved for any length of time in good condition. Nature sows her seed as soon as it ripens and falls from the tree, and in some cases this becomes an imperative necessity for the gardener or collector to adopt. Tubers of *Habenarias*, *Satyriums*, *Disas*, and many other of the South African terrestrial Orchids might be sent over in quantity during the resting season, packed in soil. Many of the European Orchids and rare or interesting Alpine or herbaceous plants may be sent by post, packed in a little damp moss, and wrapped in thin sheet india-rubber. Dr. Hooker recently observed, in reference to sending plants by post, that he had received living plants of a species of *Vanda* from India sent in that way. There can be no doubt of this being a convenient and inexpensive method of obtaining small parcels of living plants from abroad, when one has friends there to collect and send them.

ORCHIDS FOR THE SITTING ROOM.

ORCHIDS are not as yet very generally used for the decoration of apartments—a use for which many of these beautiful plants seem pre-eminently adapted. That they are used for the decoration of the dinner table occasionally we know, but it is a rarity to see any Orchid used in drawing-rooms; and yet we have many species that will make a vigorous growth out of doors during the summer if placed in a sheltered position; and species have been grown in Ward's close cases for many months together. Some Orchids bloom after their growth is matured, and finish flowering before they again commence growing; and these are the best to employ for the sitting-room, as they can be again transferred to the Orchid house before they commence their growth, and there is comparatively no danger of their being injured. To these last belong some of the cool *Odontoglossums* and *Oncidiums*, *Cœlogyne cristata*, *Lycaste Skinneri*, besides many of the glorious *Cattleyas* and *Lælias*. *Cœlogyne cristata* is one of the finest of all Orchids for indoor decoration, and during one very severe winter we repeatedly used a fine plant, with thirty or forty spikes, for the especial decoration of the dining room, and occasionally for the front hall. Under gas-light this is one of the loveliest objects imaginable, the white colour of the flowers being dazzling in its purity under artificial light. The temperature of the Orchid house in which this plant was placed last winter frequently descended to 38° , or only 6° above freezing point, and yet this plant is uninjured. Another Indian Orchid—*Aerides odoratum*—we had last winter in an ordinary lean-to, the temperature of which descended frequently to 40° and probably lower. *Crotons* succumbed to this treatment, but two small plants

of this *Aerides* are as healthy as ever, and are now growing and flowering vigorously.

It would be folly to recommend Indian Epiphytes, as *Phalænopsids*, *Vandas*, &c., to be removed to the house in the winter season; but with many of the *Odontoglossums* and *Lycastes*, this may be done with impunity if due precautions are taken in frosty weather to prevent the plants being frozen in transit. *Lycaste Skinneri* and its many beautiful varieties will last for weeks together in an ordinary sitting room, the temperature of which does not sink below 40°; and the same may be said of *Odontoglossum Alexandræ*, *Oncidium nubigenum*, and other species from the cool summits of the Peruvian Andes. During the summer months there is little danger to be feared if the plants are set in a sheltered position in the room, and not subjected to cold cutting draughts; but in the winter we would strongly recommend the use of close cases, while for small plants—as *Sophronitis grandiflora*, *S. cernua*, and *Cypripedium insigne*, *C. venustum*, &c.—common glass shades will suffice to protect them from cold draughts and the aridity of the atmosphere, which last is most to be feared in sharp frosty weather. The compost in the pots should be allowed to get comparatively dry before they are removed to a lower temperature, there being several degrees of difference in temperature between soil that is wet and dry. The following is a list of Orchids suitable for the decoration of the sitting-room:—*Lycaste Skinneri*, *L. cruenta* and *L. aromatica*; *Cœlogyne cristata*; *Oncidium nubigenum*, *O. Phalænopsis*, and *O. cucullatum*; *Cattleya citrina*; *Lælia albida*, *L. autumnalis*, *L. furfuracea*, and *L. anceps*; *Barkeria spectabilis* and *B. Skinneri*; *Sophronitis grandiflora* and *S. cernua*; *Ada aurantiaca*; *Odontoglossum Alexandræ* and *O. Pescatorei*, *Vanda cærulea*; *Cypripedium barbatum*, *C. venustum*, *C. villosum*, *C. insigne*, and *Zygopetalum Mackayi*.

HYBRIDISING ORCHIDS.

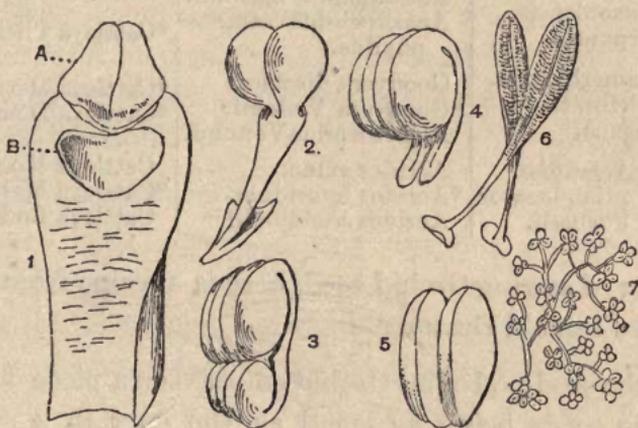
THERE is nothing particularly difficult in the mere mechanical operation of fertilising Orchids; for, in the generality of cases, the pollen has only to be applied to the stigma in order to induce fruitfulness. It may, however, be as well to note that both the pollen and stigma vary in structure and general conformation from those of most other plants. The pollen masses are of a waxy consistence, and may be reached by removing the little cap (anther) at the end of the column. The stigma, or stigmatic surface as it is generally called, lies immediately beneath the apex of the column, and is often of considerable size. Any small point, such as that of a quill toothpick, may be used to remove the pollen, and to place it in the stigmatic cavity. The pollen masses of some genera are furnished with a viscid or gummy disc, which readily adheres to the point used. The pollen masses, however, of some Orchids, such as Cattleyas, and especially Dendrobiums, will not readily adhere to the point used; but to obviate any little difficulty this may occasion, insert your toothpick into the stigmatic cavity, when it will become coated with the viscid matter or mucus therein contained, and to which the pollen masses will readily adhere, no matter how dry and glossy they may be. In a few hours after the flower is fertilized, it commences to wither, and an interesting change takes place with regard to the stigmatic cavity. This cavity is widely distended previous to fertilisation, but as soon as that actually takes place, the sides begin to contract, and finally close in on the cavity, in some cases even overlapping, and thus effectually preventing the possibility of the pollen being removed by insect or other agency, or becoming damaged by water or other foreign body coming in contact with it. The ovary

enlarges rapidly after fertilisation; the capsules of *Phalænopsis*, which are rarely half an inch long before that takes place, attain a length of from 4 to 6 inches, and the thickness of the little finger, in about sixty days after that has taken place and contain many hundreds of minute ovules. The great difficulty, however, does not lie in the mere fertilisation, but in obtaining a fair percentage of good seed; and, as before mentioned, it is requisite for the parent plant to be in the highest state of health, in order to produce seed in good condition.

After many careful experiments, I have come to the conclusion that perfect seeds are produced much more rarely than is generally supposed; indeed, I believe Orchids produce good seed but very seldom, and to this may be attributed the many failures that cultivators have experienced in their attempts to raise hybrids. When Orchid seeds are obtained, they should be examined under a good microscope; if they are perfect, the nucleus ought to be seen beneath the translucent, membranous, reticulated testa or seed coat. If the nucleus is not developed, it is useless to expect germination to take place; we might as well expect to obtain a batch of young Ferns after having sown the empty spore-cases, which last is far from being an uncommon occurrence. Not forgetting what has already been achieved in the way of hybrids, it will be generally admitted that as cultivators we have still much to learn, in so far as the raising of Orchids from seed is concerned. That which has already been done in this direction ought to induce those who have the opportunity to undertake more extended researches—take, for example, * *Calanthe Veitchii*, one of the most beautiful Orchids at present in cultivation, or * *Cattleya exoniensis*, together with * *Cypripedium Harrisianum*, or * *Cypripedium (Selenipedium) Dominicanum*. Two growers at least have succeeded in rearing seedling plants of the beautiful and rare *Cypripedium (Selenipedium) Schlimii*, viz., M. Leroy,

Passy (France), and Mr. Pilcher, gardener to S. Rucker, Esq., of Wandsworth. Perhaps the most brilliant success has attended the patience and perseverance of Mr. Dominy, of the Royal Exotic Nursery, Chelsea, who has succeeded in crossing several reputed genera, amongst which may be mentioned *Phajus* with *Calanthe*, and *Calanthe* with *Limatodes*.

I have here compiled a list of hybrid Orchids, with their parents, where known. More might be added, but this is



1. Column of an Orchid. A, anther; B, stigmatic cavity. 2. Pollinia of *Vandæ* (*Burlingtonia*). 3 and 4. Pollinia of *Epidendræ* (*Lælia* and *Cattleya*). 5. Pollinia of *Malaxidæ* (*Dendrobium*). 6. Pollinia of *Ophrydæ* (*Disa*). 7. Pollen grains separated by maceration, and seen under a microscope.

sufficient to show that much has already been done; and we may fairly ask, have these results done nothing for botanical science? By hybridisation and grafting we may prove the natural affinity of plants far better than by poring over herbarium specimens—if not so quickly, with far greater certainty. Unfortunately for horticultural science, neither Mr. Dominy nor Mr. Pilcher have as yet given us the details of their successful experiments.

HYBRID ORCHIDS.

| | | |
|------------------------|----------------------------------|-------------------------------------|
| Calanthe Masuca. | Cattleya Loddigesii. | Cypripedium Pearcei (caricinum). |
| *Calanthe Dominii. | *Cattleya Brabantiaë. | *Cypripedium Domi- nianum. |
| Calanthe furcata. | Cattleya Aelandiaë. | Cypripedium cauda- tum. |
| Limatodes rosea. | Cattleya (Lælia) crispa | Cypripedium barba- tum. |
| *Calanthe Veitchii. | *Cattleya Sidneiana. | *Cypripedium Harrisia- num. |
| Calanthe vestita. | Cattleya granulosa. | Cypripedium villosum. |
| Cattleya granulosa. | *Phajus grandifolius. | *Cattleya Pilcheri. |
| *Cattleya hybrida. | Phajus irroratus. | *Cattleya Devoniensis. |
| Cattleya Harrisoniaë. | Calanthe vestita. | *Cattleya Dominiana. |
| Cattleya Mossiaë. | Goodyera discolor. | |
| *Cattleya exoniensis. | *Anæctochilus Domini. | |
| Lælia purpurata. | Anæctochilus xantho- phyllus. | |
| Cattleya amethystina. | Goodyera discolor. | |
| *Cattleya irrorata. | *Goodyera Veitchii. | |
| Lælia elegans. | Anæctochilus Veitchii. | |
| Cattleya Aelandiaë. | Aerides affine. | Cattleya Mossiaë. |
| *Cattleya quinquecolor | *Aerides hybridum. | *Cattleya Manglesii. |
| Cattleya Forbesii. | Aerides Fieldingii. | Cattleya Loddigesii. |

Talking of sowing Orchid seed, here is a recipe from the pen of the late Donald Beaton:—

“Get the seed-pod of an Orchid emptied on a piece of smooth paper, the seeds being as small as the dust in a sunbeam. Take a very clean No. 32 pot, and put a No. 60 pot upside down over the hole at the bottom, and put a piece 2 inches square of ragged turf or fibry peat over the hole of No. 60. Then take four pieces of rough, cracked charcoal, 3 inches or 4 four inches long, and half that in width or thickness, place them on their ends against the sides of the big pot at equal distances; put your finger on the bottom hole outside, and fill the pot with water, holding the pot in the left hand. Now sow the seeds on the water, and breathe against it till the whole surface is equally dusted. Then begin to let off the water from under your finger by the bottom hole very, very gradually. As the water subsides in the pot, the seeds will stick to the sides of the pot, the peat, and the charcoal,

just like so much of a tide mark. When the water is all off, place the pot in a saucer of water, with an inch deep of water in it, and hold it to that point till your seedlings are safely on the wing; put two twigs across the mouth of the pot, and put a square of glass over the twigs, so as to leave a space for air all round the thickness of the twigs. Put the pot where it will not get more dry than it is now, and where the heat is at Calcutta point; and if 99 out of every 100 of the seeds will not vegetate, and that very soon, why the pollen has not given them the germ of life. I brought 1,000 Orchids into this world just that way, but, truth to say, they all of them found the means of getting out of the world by a route I never could fathom."

Another is as follows :—

"I have seen ripe seed-pods hanging abundantly from *Broughtonia sanguinea*, from *Angræcum funale*, and from some of the *Oncidiums* and *Epidendrums* in Jamaica; and as we know, of course, that all the species are naturally reproduced from seed, horticultural science ought to be able to solve the problem of their reproduction here. May we not look for seed packets of the epiphytal Orchids to be advertised for sale before many years as regularly as *Balsam* and *Primula* seed, if not quite so cheaply?"

Perhaps the best manner of raising seedlings is to sow the seed as soon as ripe, on the surface of pots or blocks that are covered with living *Sphagnum*. If the seeds are good, in all probability some few out of the thousands that each capsule contains will make their appearance. The time they take to germinate appears to be very uncertain, some requiring only two or three months, while others remain as many years before they show themselves. *Disa grandiflora* is one of the easiest to obtain from seed; a friend informs me that he has

hundreds of young plants from a single pod. *Cypripedium*, also, appears to germinate readily, three or four hybrids having already been obtained.

As a matter of course it cannot for a moment be supposed that seedling Orchids will supersede imported plants, provided we can rely on the stock abroad holding out; and we know that there are some Orchids rare, even in their native habitats—*Phalænopsis intermedia* Portei, *P. Lowii*, and the beautiful *Aerides Schröderi* (*A. crispum* var. *Schröderi*) being amongst the number. Again, it cannot be denied that some considerable time must elapse ere seedlings will reach a flowering condition, but this in practice would not prove a serious drawback, since if seedlings were reared year by year there would always be some in a blooming state. In the case of seedlings, there is always an uncertainty as to what they may eventually prove to be, but should they turn out distinct, there can be no doubt but that, in a pecuniary point of view, the rearing of them would be a decided success. Doubtless, when the germination of Orchid seeds is better understood, hybridisation will give us many other new and beautiful varieties.

How are we to account for the many varieties of *Cattleya Mossiæ*, unless crossing by insect agency has taken place in their native habitats, and these plants are seedlings? If the seed, then, germinates abroad, why is it so difficult to manage here at home? If we look at what has already been effected, we shall see that our list of hybrids does not include many genera,—*Cattleya*, *Cypripedium*, *Goodyera*, *Phajus*, *Calanthe*, *Lælia*, *Anætochilus*, *Aerides*, and *Limatodes* being all. *Dendrobiums* have been raised from seed, in an Orchid establishment near Manchester, but whether hybrids or not I cannot say. There would appear to be a natural affinity between *Calanthe* and *Phajus*, seeing that they cross most readily, although botanically one belongs to the *Vandæ* and the other to *Epidendrææ*.

PROPAGATION OF ORCHIDS.

THE majority of Orchids are very readily multiplied; still there are some that can only be propagated at long intervals. The value of Orchids does not depend so much on the beauty of the plant or its flowers as it does on the small quantity imported, or the difficulty of its being multiplied in our collections. *Dendrobiums* are perhaps as easy to propagate as any other Orchids. The old flowering bulbs of *D. nobile* may be cut into lengths, the latter being inserted in a common cutting-pan, covering them with a bell-glass, and plunging them in bottom heat. So treated, they break freely. *D. Devonianum*, *D. transparens*, and many others, may be propagated in a similar manner; or the old bulbs may be twisted round the tops of the pots and pegged down among the sphagnum. It is a good plan to have a close case in the Orchid-house, the bottom being covered with a layer of living sphagnum. Then, as back bulbs are cut from the plants, they should be labelled and laid on the moss, which should be watered or syringed occasionally to keep it fresh and moist. Nearly all Orchids will break freely from the old bulbs in a close humid atmosphere, provided always that there are latent buds on the parts removed. Old back bulbs of *Oncidiums*, *Odontoglossums*, *Zygopetalums*, *Miltonias*, *Maxillarias*, and *Lycastes* may be placed in a cutting-pan, or laid on a layer of moss in a warm, moist situation, where a large proportion of them will root and break freely. *Aerides*, *Vandas*, and *Saccolabiums* can only be propagated by lateral breaks. These last are produced very freely by some strong imported plants that have accidentally lost their leading growth. The same remark applies to *Camarotis*—a beautiful, though neglected, old Orchid—and to the *Angræcums*. *Thunia alba* and *T. Bensoniæ* are

very easily multiplied by cutting up the old pseudo-bulbs into pieces 3 to 4 inches long, and treating them as recommended for *Dendrobiums*. *Phalænopsis* often produce lateral breaks, and occasionally produce young plants on the flower-stems. *P. Luddemanniana* frequently does this, while *Cypripediums*, *Masdevallias*, *Disas*, and most other Orchids, are readily multiplied by division after the plants have attained to a good size.

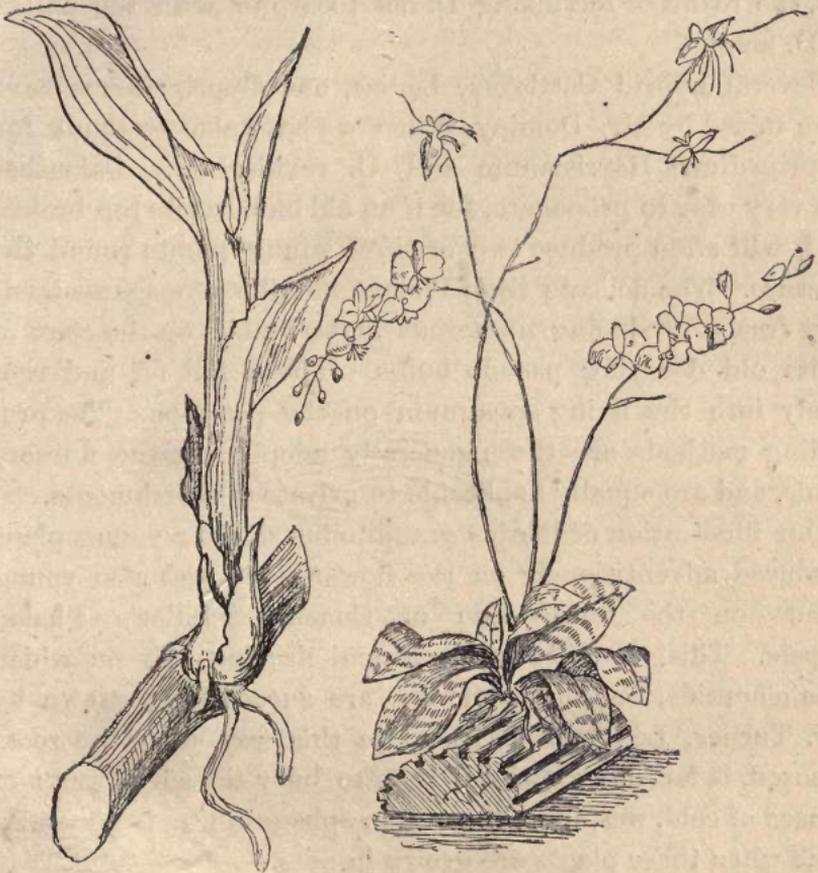
Seedling Orchids are but rarely met with, although some



Seedling *Dendrobis*.

very good things have been obtained from seed. *Cypripediums*, more especially *C. Schlimmii*, seed freely if fertilised as recommended, and the latter species generally comes true from seed. *Disa grandiflora* comes up from seed very freely, and some of the beautiful varieties into which it sports have doubtless originated in this manner. Orchids produce an immense quantity of their membranous, netted seeds, when properly

fertilised, but I am inclined to think that but a very small proportion of good seed is borne by plants in this country; that is, seed capable of germination. Orchid seed when obtained should be sown immediately on some fresh living sphagnum in a moist situation, where there is no danger of its being



Phajus grandifolius.

Phalaenopsis Schilleriana.

disturbed for twelve months at least. Even after the seed does germinate, it takes the seedlings a long time to make flowering plants; still the raising of seedling Orchids is very interesting for those who have the leisure and inclination to devote to the subject.

Seedling Dendrobes and Cypripediums have been raised at the Fairfield Nurseries—the latter from imported seed; and Mr. Mitchell, gardener to Dr. Ainsworth, Lower Broughton, near Manchester, has also some very promising seedling Dendrobes. Our sketch shows seedling plants about three years old, the result of fertilising *D. heterocarpum* with the pollen of *D. nobile*.

Several hybrid Cattleyas, *Lælias*, and Cypripediums have been raised by Mr. Dominy, whom we have also to thank for Cypripedium *Harrisianum* and *C. vexillarium*. *Calanthes* are very easy to propagate, for if an old bulb has its top broken off it will often produce two or three young plants round the fracture. The delicate little *Pleione humilis* propagates itself very freely, producing numerous little bulbils on the apex of of its old decaying pseudo bulbs. These fall off and root freely into the living sphagnum on the pot-tops. The preceding methods are those generally adopted in the nursery trade, and are equally applicable to private establishments.

Our illustration of *Phajus grandifolius* shows a young plant produced adventitiously on the flower-stem, and also young plants on the flower-stem of Consul Schiller's *Phalænopsis*. This also illustrates a semi-circular raft on which *Phalænopsids*, *Saccolabiums*, &c., are successfully grown by Mr. Turner, Leicester. Grown in this way, with the roots exposed, is far more rational than to bury the aërial roots in a mass of cold, wet, and often rotten sphagnum, as is generally done when these plants are grown in pots.

INSECTS THAT INFEST ORCHIDS.

Most plants are subject to insect pests, although it is not often that they do any serious damage, that is, if ordinary precautions are taken by the cultivator or his assistants to prevent injury. Thrips is one of the worst, especially if the temperature of the house is excessive and the atmosphere dry; but in the houses devoted to cool Orchids this ought never to be the case. The cool, moist atmosphere of the *Odontoglossum* house is not the most favourable for insect life. Red spider sometimes, though rarely, makes its appearance in a dry corner, and if there is a yellow thrips in the house it is almost certain to commence operations on the juicy foliage of *Cypripedium Schlimmi*. The yellow fly, so common in Orchid houses, will infest the flower-spikes of *Odontoglossum* and *Calanthes*, but two or three moderately strong doses of tobacco smoke will clear them out. Tobacco rag, *i. e.*, the old coverings of the rollers used in the manufacture of "twist," is far preferable to the vile rubbish sold as tobacco paper, and the chances of burning are considerably reduced by its use. In smoking *Odontoglossum*s great care must be taken, or the smoke will do serious damage. They should never be subjected to smoking if in the least degree shrivelled by a hot and dry atmosphere. Mr. Culley, who has charge of the well known collection of "Cool" Orchids at Ferniehurst, never hesitates to smoke his *Odontoglossum*s, but it must be remembered that their bulbs and foliage are fresh and plump, in which condition it rarely harms them, though Mr. Bateman, whose name in connection with Orchids is well-known, strongly objected to the use of tobacco smoke in the *Odontoglossum* houses.

Orchids grown in cool houses rarely suffer from the small

white and brown scales which make such sad havoc among *Aerides* and *Vandas*; still, if they should put in an appearance, it will most likely be in the warm end among the *Cattleyas* and *Trichopilias*. If the plants are regularly sponged over with tepid water, and kept free from dust and dirt, they are not near so liable to the attacks of insect pests as they otherwise would be, and the plants look all the better for the trouble.

Some insecticides are very effective in the destruction of thrips and green fly; we have used "Fowler's" with success and also "Frettingham's." Messrs. Parr & Atherton, of Nottingham, have registered an effective contrivance for applying the latter kind in the form of fine spray, and by the use of this invention a little of the compound is made to go a long way, and it forces it in among flower-buds of the most delicate description without injuring them in the slightest degree. This latter is very useful when but a few individual plants are affected, but when a large quantity of good-sized specimens has to be cleaned there is no better contrivance than the water-barrow we have figured. This can be half filled with any useful insecticide and then the plants may be entirely immersed so as to ensure the death of every insect with which it may be infested, or the plants may be held partly in the liquid and syringed thoroughly without any of the compound being wasted. Anyone who once possessed this useful contrivance would never care to be without it. I would caution the unwary cultivator against the use of methylated spirits for clearing Orchids of white and brown scale. It kills scale without a doubt, but seriously disfigures the foliage operated on, more especially if it gets caught by the sun's rays soon after it is applied. The following are well-known methods of capturing and destroying insects that infest Orchids generally.

For Cockroaches and crickets, place bell glasses, bottles,

smooth or glazed pans, so that the sides are in a slanting position, and fill them with treacle and water, in which the insects drown themselves. Woodlice may be destroyed by placing Potatoes cut in halves about the plants, which should be examined every day till they disappear. Green-fly may be killed by smoking, but it must be done very carefully with good tobacco paper, or the leaves of some will suffer. If to 1 lb. of tobacco paper, 1 oz. of saltpetre be dissolved in water by boiling it in a small pan, and sprinkled over the paper, or the paper soaked in it, it doubles the strength of the paper without much increasing the risk of burning, still only half the quantity must be used, and if a certain weight be not strong enough for a house, it may be gradually increased. Three smokings on successive nights will kill thrips; or for either thrips or spiders, if the plants be washed with a mixture of 1 oz. of bitter aloes and 1 oz. of tobacco to a gallon of water, it is safer than mixtures containing soft soap or turpentine, which are apt to burn the plants or spoil the leaves if it gets in the crowns. Tobacco water made from pure tobacco in bond, free of duty, may be had at many places, and at the nurseries at 3s. 6d. per gallon. They should be washed immediately on its appearance, and the plants examined a time or two about once a week after, and if done as soon as seen, and not allowed to spread, there is little difficulty in keeping them clean. Ants may be destroyed by a few fresh, unpicked bones being placed for them, or sponges wetted and filled with sugar, or treacle in bottles or pans. Slugs may be collected by a little bran placed under some Cabbage leaves, or pieces of bark with the hollow side down, which is also a good trap for woodlice.

SELECT DESCRIPTIVE LIST OF COOL ORCHIDS.*

Acineta.

THIS is a small genus of robust, sub-terrestrial Orchids from Central America. Pseudo-bulbs large as hen's eggs, angular bearing two to four broad lanceolate, ribbed leaves; flowers sub-globose, fleshy, arranged on stout, pendulous racemes, which depend below the baskets, in which all the species of this section should be grown.

A. Barkeri (Mexico, 1837).—This species inhabits shady valleys. Pseudo-bulbs, five to seven inches long, bearing about three broad lanceolate leaves, two feet long, and of a fresh green colour. Scapes stout, produced from the base of the bulbs, drooping, bearing fifteen to thirty flowers; colour yellow and dark crimson, scented; May and July. This species has several times been figured as *Peristeria Barkeri*.

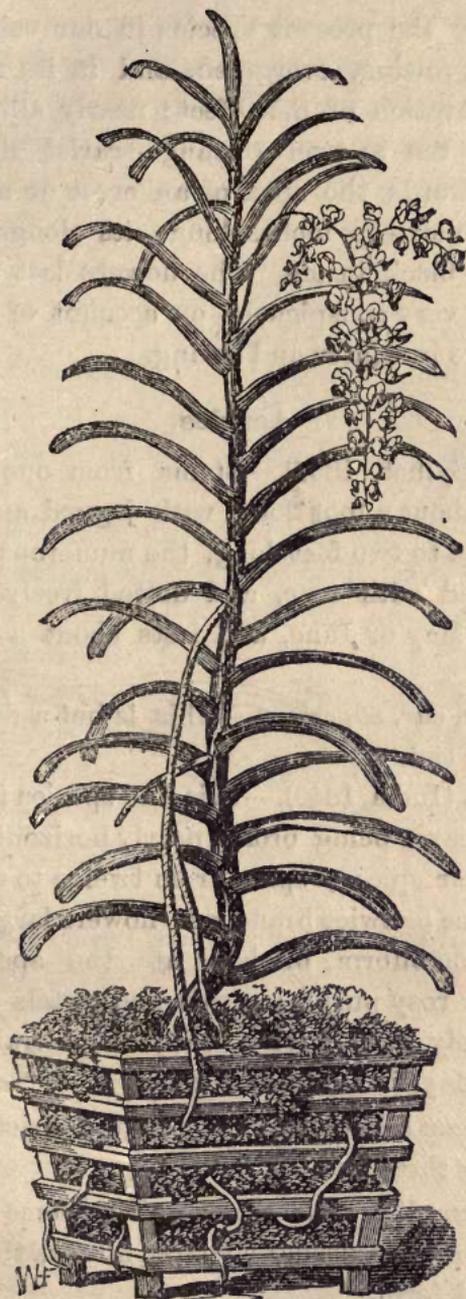
A. densa.—A robust growing species, in habit similar to the above; flowers sub-globose and of a waxy consistence; colour lemon yellow, dotted with brown; also known as *Acineta Warszewiczii*.

A. Humboldtii (Columbia, 1842).—A fine species, but its flowers speedily fade. It blooms in March and April; scapes two feet long; it has been figured as *Peristeria Humboldtii*, and is occasionally known as *Acineta superba*. All the preceding are large-growing plants, and affect a shady position in the house, together with a copious supply of moisture when growing.

Ada.

A. aurantiaca (New Granada).—This genus is as yet only

* Those species marked with an asterisk * will be found to succeed best in the warm end of the house.



Erides crispum.

represented by the present species in our collections; it is rather dwarf growing, evergreen, and in its native habitat grows at an elevation of 8,500 feet; nearly allied to *Brassia*, it bears from ten to twelve orange-scarlet flowers, rather closely set towards the apex of an erect or nodding spike, from twelve to sixteen inches long; its elongated petals are streaked with black inside. The flowers last a considerable time, and are very conspicuous on account of their brilliant colour; flowers in winter and spring.

Aerides.

**A. affine* (Sylhet, 1837).—Stems from one to three feet high; leaves about a foot long, with jagged apices; racemes cylindrical, one to two feet long, the numerous flowers being white, suffused with rose, and dotted freely with purple; blooms about May or June, and lasts about a month in perfection.

**a. A. affine, var. superbum*.—This is but a deeper coloured variety of the last.

**A. crispum* (India, 1840).—This fine species is rather formal in habit, its leaves being broad, nearly horizontal, and bluntly bilobed at their apices; spike from twelve to eighteen inches long, often once or twice branched; flowers large, the lip being somewhat rhombiform, bilobed at the apex, and deeply suffused with rosy purple; sepals and petals pure white, or white delicately shaded with rose; it generally blooms very freely about May, June, and July.

**a. A. crispum Lindleyanum* is a robust variety of the above, often growing three feet high.

**b. A. crispum Warneri*.—Another handsome variety, having narrower leaves, and deeper coloured flowers than those borne by the normal form.

**A. Fieldingii* (India).—This is one of the finest of all, and

commonly goes under the *soubriquet* of "The Foxbrush *Aerides*." It grows from two to four feet high; its stems being densely clothed with dark green foliage; its spikes vary from two to three feet long, often branched, and are freely produced from April to July; flowers white, suffused with rose and dotted with purple.

Angræcum.

The finest species of this genus come from the island of Madagascar, and a good number of small-flowered species are found in Southern Africa; but the only species we have amenable to cool treatment is the little *A. falcatum*, a native of Japan.

**A. falcatum*.—This dwarf little plant is also known as *Sarcophilus falcatus*, and by Lindley, I believe, it was named *Ceecoelades falcata*. Its foliage, like its congeners, is two-ranked or distichous. Leaves from two to four inches long, nearly triangular in section, being thick and fleshy; the whole plant not above six inches high. Flowers from four to seven, on an erect spike shorter than the leaves; flowers pure white, the lip having a spur two and a half inches long, and the flowers, in size and shape, are not unlike those of the British Butterfly Orchis (*Habenaria bifolia*). Should be grown in peat, in a basket or small pot suspended near the glass, but rather shaded.

Anguloa.

A small genus containing some half dozen species of very robust appearance. They are all from Columbia or New Granada, growing in their native habitats in moist, shady positions, under trees. The pseudo-bulbs are from five to eight inches long, as thick as a man's wrist, bearing two to three erect, broad, lanceolate leaves from two to four feet long. Their flowers resemble great waxy deformed Tulips, being,

borne solitary on scapes from twelve to sixteen inches high several of which are produced from the ripened pseudo-bulbs of the preceding season's growth, about March and April. They must be grown in a shady position, and be liberally supplied with moisture when growing.

A. Clowesi.—Flowers clear golden yellow, lips whitish; the sepals and petals are concave, consequently the entire conformation of the flower is globular or nearly so. This species is found in Columbia at five to six thousand feet elevation.

A. Ruckeri (New Granada, 1845).—Habit like the preceding. Flowers greenish-orange outside, inside they are either deep crimson brown, as in the variety sanguinea, or a lighter brown speckled with nankeen or tawny yellow.

A. uniflora.—This beautiful species was introduced in the same year as *A. Clowesi* (1844), and is one of the best in cultivation. Its large, sub-globose flowers are white, delicately tinged with peach, and spotted profusely with pink inside.

A. eburnea.—A rare and beautiful white-flowered species, which succeeds if treated as above.

Arpophyllum.

A small genus of evergreen epiphytes from New Granada and Mexico. One of the finest plants I have seen is in the collection of A. Turner, Esq., Narborough-road, Leicester.

A. giganteum (1839).—This is a beautiful plant, the leaves of which are about two feet long, and are borne on slender pseudo-bulbs. The flowers are deep rosy purple—small, but densely and symmetrically arranged on cylindrical spikes from twelve to fourteen inches long. When well grown, the plants flower freely, and form objects of singular beauty. They grow freely in fibrous peat, one-third turfy loam, freely interspersed with lumps of fresh charcoal and an abundance of corks. They like plenty of water when growing.

Barkeria.

Deciduous epiphytes, from Central America or Mexico, having slender pseudo-bulbs from six to twelve inches high. Like all other Orchids, if grown well they bloom freely. They grow vigorously in a cool, airy temperature, suspended in pans or small baskets close beneath the glass, and slightly shaded with tiffany or other light fabric. I have grown these plants in pans filled with oak sticks and living sphagnum, dipping them in tepid water three or four times daily when growing. Under this *régime* they succeeded admirably and flowered profusely.

B. elegans (Guatemala).—A beautiful, slender-growing species; spikes slender, two feet long; sepals and petals rosy lilac; lip white or lilac, blotched with reddish crimson. It is one of the finest of all the *Barkerias*, and varies slightly, there being two or three varieties in cultivation.

B. Lindleyana (Batem. 1840).—A free-flowering species, native of Costa Rica; racemes two feet long, very slender, bearing from five to seven flowers near its apex; sepals and petals rosy purple; lip white, with a deep purple blotch at its apex. It flowers in September or October, and lasts a considerable time in beauty.

B. melanocaulon (Costa Rica).—A species but rarely met with. Flowers on an erect spike in August and September, lasting a long time in beauty; sepals and petals rosy lilac; lip pink or reddish purple, having a blotch of green in the centre. It is a very desirable species, and grows well treated like its congeners.

B. Skinneri (Guatemala).—This is a very vigorous species, and is valuable as a winter blooming plant. Spikes produced from the apices of the ripened growth from six to nine inches long, often branched, forming a dense mass of deep purple blossoms. If kept dry it lasts from eight to ten weeks.

a. *B. Skinneri* var. *superba* (see Warner's pl. 38).—This is a fine, richly-coloured variety of the above, flowering at the same time.

B. spectabilis (Guatemala, 1843).—This is a fine, large-flowered, summer-flowering species, the individual flowers being fully two inches across; sepals and petals oblong, acuminate, of a rosy lilac colour; lip white, margined with deep lilac or rosy purple, and dotted or spotted with crimson; imported plants of this, as of many other Orchids, vary greatly; blooms in May and July, and lasts from eight to ten weeks in beauty. This and the preceding species may be removed to the drawing-room when in flower, and, if protected by a large glass-shade or bell-glass, will form objects of beauty, the enjoyment of which need not be marred by any anxiety as to their ultimate welfare, if the temperature of the apartment is kept above freezing-point.

Calanthe.

A genus of beautiful plants, mostly tropical; still *C. veratrifolia* will grow vigorously and flower freely in the warm compartment of the cool house.

**C. veratrifolia* (East Indies, 1819).—Leaves two feet or more in length, plaited, with wavy margins, and of a fresh green colour; scapes from two to three feet high, freely produced on well-grown plants; flowers pure white, except the green tips of the sepals and the golden papillæ on the disc of the labellum; the flowers turn blue and eventually black if bruised; it lasts from six to eight weeks in perfection, and, when well bloomed, is a beautiful plant; May and July.

Cattleya.

This is one of the most showy genera we have amongst Orchids, some of the species bearing handsome flowers, from six to eight inches across, and most beautifully tinted with

crimson, purple, and gold. Some species have these colours delicately shaded into each other with indescribable softness, while others surprise us by the lavish manner in which masses of pure, glowing colour are boldly contrasted with the purest of white grounds. Cattleyas grow best in pots in good fresh fibrous peat and living sphagnum; they all luxuriate in a moist but airy atmosphere, and a moderately cool temperature; some few of the small-growing species, as *C. Aclandiae*, *C. Walkeriana* (*bulbosa*), *C. citrina*, and *C. marginata*, do best on blocks or in small, shallow pans suspended near the light.

**C. bulbosa* (Brazil, 1846).—A dwarf species, rarely exceeding six inches in height; it has a habit of making two growths in the season, and often flowers from both; its flowers are of a good size, and borne one and two together; they are four and five inches across, of a bright rosy lilac colour. It should either be grown on a block with a little living sphagnum Moss or grown in a shallow pan, in fibrous peat, sphagnum, and lumps of charcoal, well drained, and suspended near the glass; February and March; lasting four and five weeks in beauty.

**C. citrina* (Mexico, 1838).—This is a very handsome and strikingly unique species, there being no other Cattleya that approaches it in habit or colour. Its pseudo-bulbs are as large as pigeons' eggs, covered with a silvery membrane when young. Two to three leaved; leaves from six to ten inches long and about one inch broad, of a pale glaucous colour. Flowers solitary from the latest developed bulbs, and of a bright uniform lemon-yellow colour, most deliciously perfumed. The flowers are stout and of a waxy consistence, lasting about a month in beauty. It should be grown downwards, on a block, and dipped in tepid water once or twice a day when growing.

**C. crispa* (Rio Janeiro, 1826).—Also known in some collections as *Lælia crispa*. It is a grand old Orchid—one of the

most useful, and very easy to grow. Pseudo-bulbs clavate, from twelve to fourteen inches high, one leaved; when well grown producing strong spikes, each bearing from five to nine delicate flowers. Sepals and petals white, or white suffused with lilac; lip crimson velvet, with a narrow white crisp margin, which gives a most beautiful finish to the flowers. Flowers from four to five inches across, lasting from two to four weeks in perfection, and generally flowering about July or August. This makes an excellent plant for the autumn exhibitions when well grown.

**a. C. crispa superba*.—This is a fine deeply-coloured variety of the above, flowering at the same time.

**C. labiata* (Brazil, 1818).—The real old *Cattleya labiata* is one of the finest Orchids grown, but a good many varieties, more or less beautiful, are cultivated under this name. The flowers of “*labiata*” are five or six inches across, of a delicate rosy lilac, the apex of the lips being one dense glowing mass of crimson purple. It is one of the finest winter-flowering Orchids grown, and is also very useful to exhibitors for the early spring shows. The season of flowering is often varied according to the treatment the plants have received. It generally lasts a month in perfection.

**a. C. labiata, var. pallida*.—This variety is very distinct in habit, having light green leaves, very shining, and it generally goes under the name of the “summer-flowering variety of *labiata*.” It is useful, and may be added to collections to succeed the normal type in flowering, though it is not so effective in general appearance.

**C. marginata* (Brazil, 1843).—A dwarf little plant suitable for growing in a small pan, as previously advised, or for placing on a block. Flowers from three to four inches across, of a bright crimson purple colour. Lip with a clear white margin, hence the specific name. It is delicately perfumed. Flowering

about September or October, it lasts a fortnight or three weeks.

**C. Mossiæ* (Venezuela, La Guayra, 1836).—This species is the sheet anchor of Orchid growers, or rather was previous to the introduction of *Odontoglossum Alexandræ*, and deservedly so, for its beauty will bear comparison with that of any other



Cattleya Mossiæ.

plant in the vegetable world. The great charm about this plant is that there are scarcely two varieties to be found alike. On this point the *Gardeners' Chronicle* of June 11th 1864, in speaking of the protean characteristics of this species, as illustrated in the magnificent collection of named varieties

grown by R. Warner, Esq., says one of the specimens, "was a mass of two feet across, and bore thirty of its noble flowers. Scarcely two plants are alike, and some are most remarkably distinct from each other, so that in future it will not be enough for the lover of Orchids to place *Cattleya Mossiæ* in his collection; he must make up his mind how many forms he will admit, and then set about seeking out those which best suit his fancy." The individual flowers of a good *C. Mossiæ* are from six to eight inches across, the sepals and petals being of a delicate rosy lilac or flesh tint, while the lip is richly coloured with golden-yellow, and the most gorgeous blotching and veining of crimson velvet. The principal varieties are—

- | | |
|---------------------------------|-------------------------------|
| <i>a. C. Mossiæ aurantiaca.</i> | <i>d. C. Mossiæ rosea.</i> |
| <i>b. C. „ superba.</i> | <i>e. C. „ speciosissima.</i> |
| <i>c. C. „ picta.</i> | |

**C. Skinneri* (Guatemala, 1836).—This is a very distinct plant. Its clavate smooth pseudo-bulbs bear two oblong leathery leaves about three inches long. Flowers from four to nine on a spike, of a clear bright crimson-purple, the lip being several shades darker. This is a first-class plant for the spring and summer exhibitions, as it is easily grown and flowers very freely. A. Turner, Esq., of Leicester, exhibited a remarkable plant of this species in London in 1866, one glorious mass of blossom, having between twenty and thirty spikes of flowers upon it. A plant of *C. Mossiæ* grown in that gentleman's collection has also been very much admired.

**C. Trianix*.—This is also known as *C. Warscewiczii*, and like its allies, *C. labiata* and *Mossiæ*, it sports freely into several more or less distinct varieties; sepals and petals nearly pure white, lip rosy-lilac with a yellow "throat." They are all easily grown, and blooming as they do in the winter months, makes them doubly valuable.



Cattleya Trianae.

None of the Cattleyas herein mentioned are expensive, and if two or three only of each are grown, they will, with even moderate treatment, produce a succession of their beautiful flowers all the year round.

Cœlogyne.

We have only one species in this genus worth including in our select list—excepting, of course, the delightful little members of the Pleione group. Many of the Cœlogyne are amenable to cool treatment; but do not produce their flowers so freely, or in sufficient abundance, to justify us in including them here.

C. cristata (1837).—A glorious winter-flowering plant from N. India, Sylhet, and Nepaul, where it is frequently found at from 5,000 to 8,000 feet altitude. Pseudo-bulbs as large or larger than pigeons' eggs, of a glossy green colour, and quite plump when well grown, each bearing two dark glossy green lanceolate leaves from six to twelve inches long; flowers from two to three inches across, five to seven on a drooping scape; of the purest white colour, except the lip, which has a blotch of bright orange yellow on its disc, and two rows of pectinate teeth. Well-grown specimens bear from twenty to ninety spikes, and last a month in beauty. This is an old plant, but one of the finest of Orchids grown for the winter decoration of either the Orchid house or the drawing-room. A single spike of its snowy flowers neatly arranged on a frond of Maiden-hair Fern forms a most *recherché* head-dress.

Colax.

C. jugosus.—This is a rare and strikingly handsome species, which we first saw in Mr. S. Rucker's choice collection at Wandsworth. Pseudo-bulbs from two to three inches high, ovoid; two-leaved—leaves broad, lanceolate, from six to nine inches long;

flowers one inch and a half across, from two to four on an erect spike; sepals about one inch long and half an inch broad, pure white; petals white, heavily blotched with purple; lip panduriform, streaked, and blotched with dark bluish purple; column white, with a few purple streaks; yellow in front. The vivid contrast between the pure white segments and the rich purple blotches is very pleasing. It lasts a long time in beauty. Also known as "Maxillaria Jugosa." It is a native of Brazil, and grows vigorously in the intermediate house.

Cymbidium.

This is comparatively a large genus of terrestrial Orchids; still, they are rarely met with in cultivation. They all grow freely in a compost of fresh fibrous peat and crocks, with sand and lumps of charcoal intermixed. The pots must be thoroughly well drained, and the plants like plenty of moisture when growing.

**C. eburneum* (China, E. Bengal).—Foliage distichous, pale green, from sixteen to eighteen inches long, half an inch broad; grows freely in a moderate temperature that does not descend below 50° in winter; flowers borne two together, on erect scapes; they are of the purest white colour generally, though some varieties have their petals slightly spotted or suffused with soft flesh colour; lips with a velvety, golden ridge down the centre of the disc. This is a fine species, and specimen plants of it are worth as much as from fifty to one hundred guineas each. Flowers in the spring last fully six weeks in beauty.

C. Hookerianum.—This is a truly distinct and noble species, bearing great spikes of from five to ten large green flowers, with a pale yellow-crimson blotched lip; individual blooms from three to four inches across. When not in flower, this plant is easily distinguished by the pale yellowish green petioles of its foliage, being distinctly striped with dark green, and having red margins. A fine plant of this flowered in the rare collection of

G. Davis, Esq., Colston Basset, Notts. It is a native of the Sikkim Himalayas, and grows vigorously in a moderate temperature, if plentifully supplied with moisture.

**C. Mastersii* (1841, a native of the E. Indies).—Flowers snowy white, five and eight together, from near the apex of an erect scape; the labellum of this species is more or less suffused or shaded with delicate flesh colour; delicately perfumed, like almonds; grows freely with the same treatment as *C. eburneum*; flowers during the winter months, and lasts from five to six weeks.

Cypripedium.

A large and interesting genus of curious and beautiful plants, the species of which are widely distributed, from the temperate woods of North America on one hand to the heat and moisture of the tropics on the other. The flowers are peculiar, from their having a slipper-shaped lip (see p. 71), hence their common name, "Lady's Slippers." A large proportion of these plants will grow vigorously in a cool house that does not descend below 45° in the winter. *Cypripediums* are decidedly terrestrial plants, and will succeed admirably in a compost of fresh turfy loam—the more fibre there is contained in it the better—well dried cow-dung, and good fibrous peat. The pots or pans should be well drained, and then the plants may be freely watered all through the summer months. They must never be allowed to become dry, even when at rest, and when growing the syringe may be used freely to keep down thrips. Most of the species may be grown in large flat pans, and are well adapted for exhibition purposes. The hardy or half-hardy section has been neglected, but we give a popular synopsis of them, and hope ere long to meet with them in cultivation. Many of them are quite as beautiful as those at present in cultivation in our plant houses.



Cypripedium barbatum Veitchii.

**C. barbatum* (Malacca, Mount Ophir, 1838).—This is a well-known plant, and very commonly met with at summer exhibitions. Leaves from five to six inches long, green and variegated. Flowers from two and a half to three inches across, of a purple colour mixed with green, the dorsal sepal being nearly white, striped with purple, greenish towards the base; petals having shining hairy warts along their upper margins. Lasts six weeks, and blooms from January to June.

a. **C. barbatum Dayi*.—A large and handsome variety.

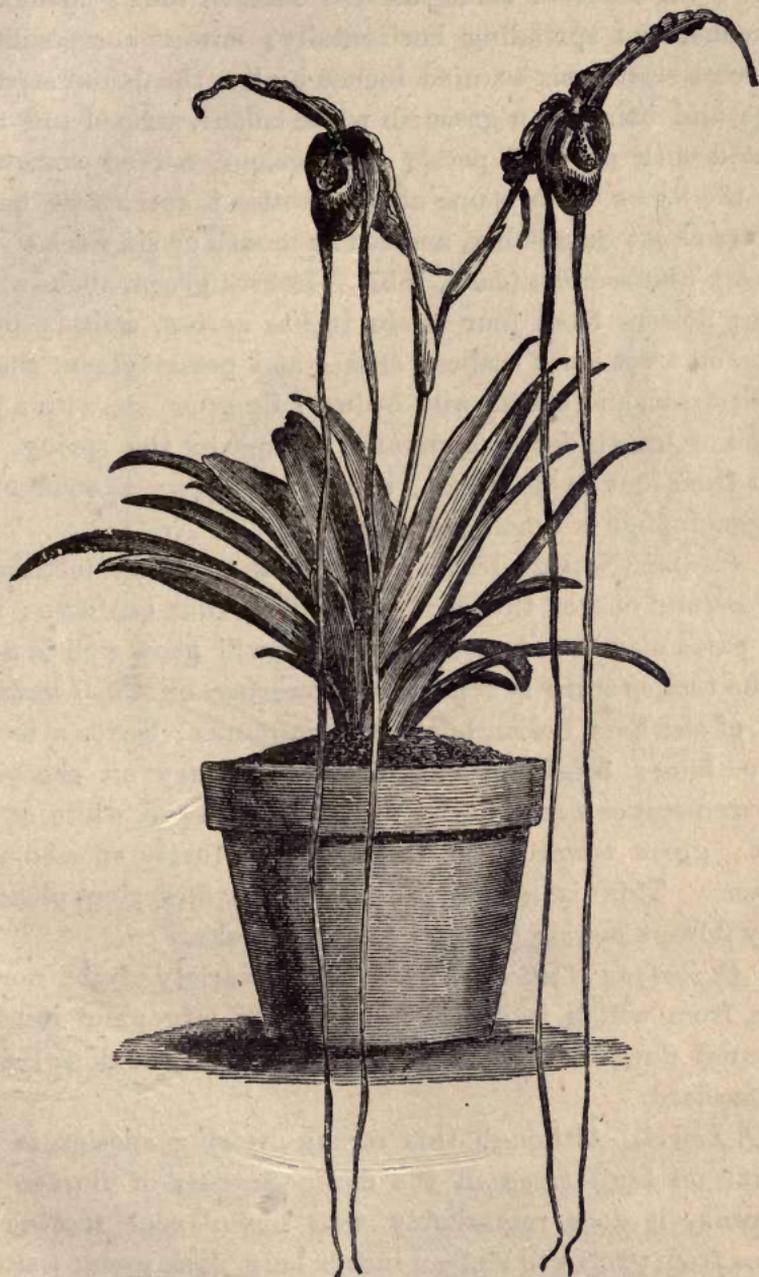
b. **C. barbatum nigrum*.—Another good and distinct variety, distinguished by the superior size of the flowers and the dark purple colour of the lip.

c. **C. barbatum Veitchii*.—This has flowers as large as *Dayi*, but with spotted petals. It is a grand variety, and should be added to the most select collections. July. Often met with in nurseries named *C. superbiens* or *C. grandiflorum*.

**C. caudatum* (1848).—This is a curious long-tailed species from the highlands of Peru, and is often killed by being coddled in a high temperature. It is one of the finest of all the *Cypripediums*, and grows well in a cool temperature. Leaves from twelve to fourteen inches long, bright green. Scape one to two feet long, bearing two to three large yellow and rosy purple flowers, the petals of which gradually elongate after the flower-bud expands, and ultimately reach the great length of twenty or thirty inches. This plant grows vigorously in the compost above recommended, and the top of the pot should be covered with fresh living sphagnum, into which the plants will be found to root freely.

a. *C. caudatum roseum*.—This is a deeper coloured, and by some growers is considered a better variety than the normal type.

**C. Fairieanum* (Assam).—This is a rare and very distinct



Cypripedium caudatum.

plant; leaves from three to five inches long; somewhat glaucous, and spreading horizontally; flowers borne solitary on erect scapes, six to nine inches high; the dorsal sepal is large and hairy, of a greenish white colour, striped and reticulated with purple; petals same colour, curved somewhat like the letter S; it is one of the prettiest species we have; flowers about September, and lasts a month or six weeks.

**C. hirsutissimum* (Java, 1857).—Leaves green, about a foot long; flowers from four to six inches across, solitary or in pairs, on erect hairy scapes; sepals and petals green, shaded with purple, and dotted with brown: lip greenish, with a profusion of brown dots; generally blooms in the spring, and lasts from four to six weeks; it is not so showy as some of its congeners, but is worth growing.

C. insigne (Nepaul, 1821).—One of the earliest introduced species, and one of the best for free-flowering qualities; it is not particular as to temperature, as it will grow well in a pit, if the temperature is kept above freezing, or it will bear the heat of the East Indian house with impunity; leaves a foot or more long; bright green; flowers solitary on chocolate-coloured scapes a foot high; dorsal sepal large, white at the apex; green towards the base, and profusely spotted with brown. This is a splendid old winter-flowering plant, its waxy flowers lasting from six to eight weeks.

a. *C. insigne Maulei*.—This is a fine variety of the normal type, from which it differs in its having larger and brighter coloured flowers, with much more white on the dorsal sepal or standard.

**C. Lowii*.—Although this strong-growing species is epiphytal on high trees in the dense jungles of Borneo and Sarawak, it does remarkably well under cool treatment; leaves from twelve to sixteen inches long, dark green; scapes from two to four feet long, two to five flowered; colour



Cypripedium Fairieanum.

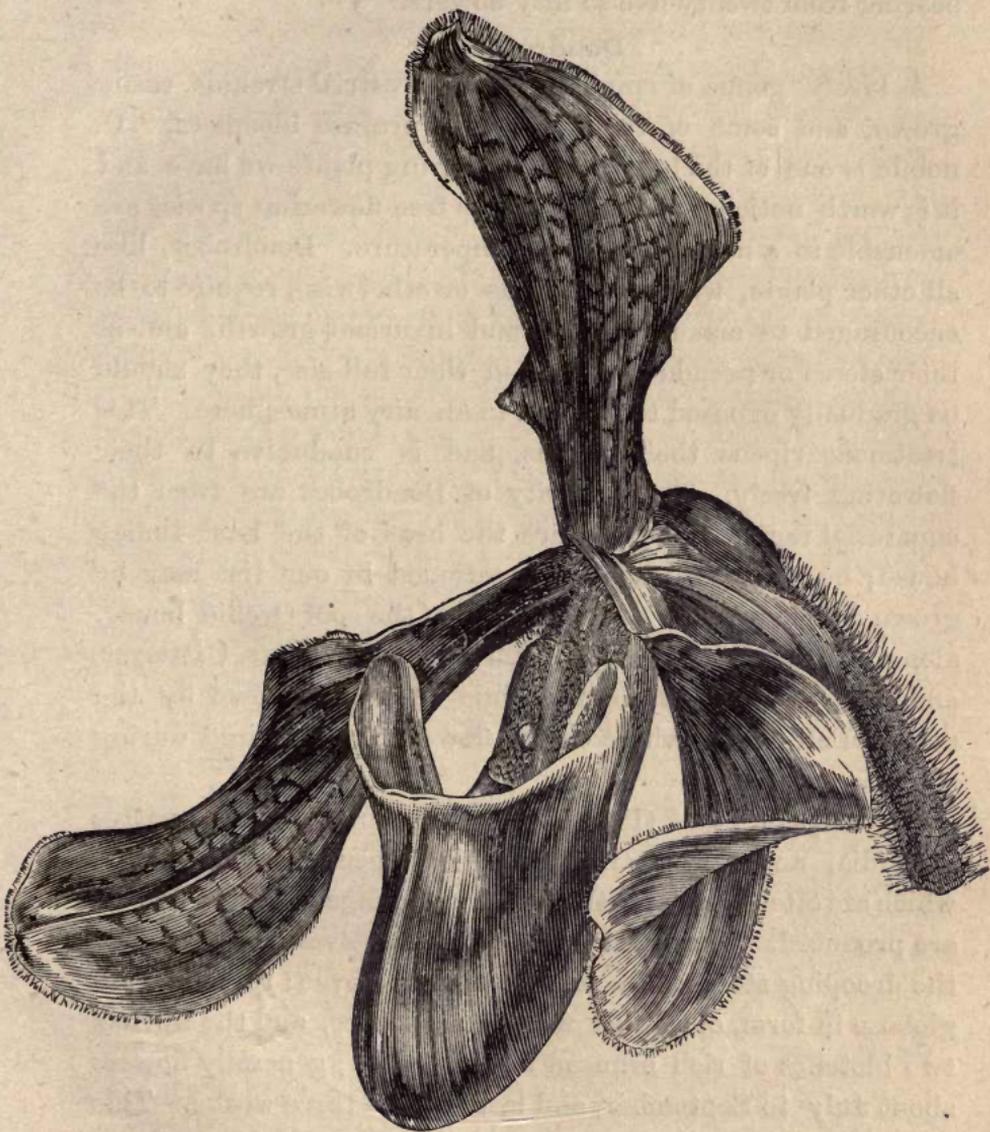
yellowish green and purple, spotted with brown; flowers in April and May, and lasts from eight to ten weeks. Some fine plants of *Cypripedium Lowii* may be seen in the collection of John Russell, Esq., Mayfield, near Falkirk, N.B. The plants there are grown by Mr. Sorley, and are in the finest health and vigour.

C. Schlimmii.—A very pretty and distinct little species from the inexhaustible resources of New Granada, where it flourishes at an altitude of from 4,000 to 5,000 feet; the leaves are of a bright green colour, from twelve to sixteen inches long; flowers borne on erect scapes to the number of from six to eight, only two to three expanded at the same time; sepals greenish white, petals white, often spotted with rose; lip rounded, swollen, white, with a fine rosy purple blotch in front. A fine plant of this species may be found in the collection of E. Wrigley, Esq., Bury, Lancashire. I measured the leaves on this plant, and found them sixteen inches long, and over two inches broad, the plant being in the best possible health.

C. venustum.—Another old variegated species, introduced from Nepaul in 1816: sepals white, with green lines, petals green and purple; lips bronzy, veined with green. This is one of the hardiest of its class, except *C. insigne*, and lasts a long time in flower; blooms during the winter months.

a. C. pardinum.—A vigorous variety having larger flowers than *venustum*, and often two and three together on one scape; the leaves are broader and the blotches not so well defined.

**C. villosum*.—A fine species from Moulmein or the Tonghoo Mountains; leaves green, spotted with purple towards the base behind; flowers from four to five inches across, of a bright brown colour, shining as if varnished. It is a remarkably free flowerer, blooming in the spring and lasting for five or six



Cypripedium villosum.

weeks. When well grown, it makes a fine exhibition plant, bearing from twenty-five to fifty flowers.

Dendrobium.

A lovely genus of epiphytal and terrestrial Orchids, easily grown, and some of them are very profuse bloomers. *D. nobile* is one of the best winter-flowering plants we have, and it is worth noticing that most of the free-flowering species are amenable to a moderately cool temperature. Dendrobes, like all other plants, whether Orchids or otherwise, require to be encouraged to make vigorous and luxuriant growth, and as their stems or pseudo-bulbs attain their full size, they should be gradually exposed to the sun in an airy atmosphere. This treatment ripens their tissues, and is conducive to their flowering freely. The majority of Dendrobes are from the equatorial regions, and require the heat of the East Indian house; but all those species mentioned in our list may be grown and flowered in the warm end of the cool Orchid house, along with many of the *Cypripediums*, *Trichopilias*, *Cattleyas*, and *Miltonias*. *Dendrobium nobile* should be grown by the dozen in all places where choice flowers are required during winter.

**D. chrysanthum* (1828).—This old species is a native of India, and flowers freely on its ripened pseudo-bulbs, which are often clothed with fresh green foliage when the flowers are produced. The flowers develop themselves on each side of the drooping stems in fascicles of three to seven; they are sub-globose in form, of a thick waxy consistence, and the lip has two blotches of rich crimson in the centre; generally flowers about July to September, and lasts two to three weeks. This is a vigorous species and grows well in a moderate temperature.

**D. heterocarpum* (Ceylon).—A fragrant winter blooming plant, producing pale yellow flowers with a brownish hairy lip,

stems twelve to eighteen inches high, and as thick as the finger. It grows very freely in an intermediate house. This plant is an old one, but not met with so frequently as it ought to be, considering its easy culture and enormous crops of deliciously performed flowers. The flowers last a long time in beauty and are always favourites with the ladies. It is identical with the *D. aureum* of Lindley.

**D. moniliforme*.—According to our best authority on Orchids, the proper name of this plant is *D. Linawianum*, but as it is generally known to gardeners and nurserymen under the above, it is best to employ it here. Bulbs one to two feet high, flat, fluted, the internodes contracted. The flowers are produced in the same way as in *D. nobile*, but are a little smaller, and of a more rosy colour. It is one of the best winter-flowering species and a good companion to *D. nobile*. Flowers in December, lasting two to three weeks. Introduced from China and Japan in 1824.

**a. D. moniliforme majus*.—This is a strong growing variety with larger and deeper coloured flowers.

D. nobile (Macao 1836).—The best winter-flowering Orchid we have, and if grown in quantity may be had in flower for seven or eight months of the year, by encouraging some in their growth, and retarding others, by keeping them in a cooler house. The flowers themselves are invaluable for mixing with Ferns and other exotics in the formation of bouquets and dinner-table decorations. Flowers borne two or three together up the stems, each bloom being two inches across, of a white colour shaded with lilac, and tipped with purple. Lips tipped with purple, with a deep crimson blotch on the disc.

a. D. nobile pendulum

b. „ Wallichianum.

These are two of the best defined varieties of “*nobile*,” but the distinctions are but slight.

**D. speciosum* (New South Wales, 1824).—A plant attaining to a large size, and though by some considered difficult to flower, I have always found it to bloom well when liberally treated. Its bulbs are large, from twelve to fourteen inches long, as thick as the wrist at the base, bearing from three to four thick leathery leaves at their apices, of a dark-green colour; spikes from twelve to eighteen inches long, one or two being produced from the apex of the well-ripened bulbs. Flowers rather small, of a waxy consistence, and of a creamy-white colour. Lip dotted with brown. This is commonly called the "Rock Lily" in its native habitat. It flowers in winter or spring, and lasts three weeks.

**D. Hillii*.—A form of the last; but differs from it in having longer and more slender bulbs, and the flower-spikes are also much longer. Flowers very profusely and makes an excellent exhibition plant when well grown.

Both the above grow best in a compost of fresh fibrous peat and dry turfy loam, from which the small particles have been removed by sifting. To this add coarse sand and a few dry horse-droppings or dry cow-dung; either will do, though the former are preferable. See that the pot is well drained. When growing, the plants should receive an abundance of water. Exposure to the sun will be beneficial if air is freely admitted.

**D. transparens* (1849).—This pretty little species comes from the cool hills of Northern India, where it is epiphytal on trees. Altitude, 5,000 to 6,000 feet. In habit and flowers it looks like a dwarfed *D. nobile*, pseudo-bulbs slender, two feet high; flowers semi-transparent, from one to one and a half inch across, white shaded with pink, lip with a purple blotch in the centre. Flowers in April or May, and lasts well. It grows very freely when treated like *D. nobile*, and bears a cool temperature with impunity.





1. *DISA GRANDIFLORA*.
2. Pollen masses. 3. Stigmatic surface

The preceding species will furnish abundance of flowers, and several of each should be grown, if space permit. More species might be included in this list, but as they do not bloom profusely they have been omitted.

Disa.

A genus of very cool Orchids from the Cape of Good Hope. They are rather numerous and some are showy, but many of them are scarcely worth growing. The blue *D. Henshallii* and one or two other species have recently been imported and sold at Stevens'. *Disa grandiflora* is one of the best, and *D. macrantha* is a magnificent species, very variable in its colour, some varieties being nearly pure white, while others are of the deepest rose colour blotched with crimson. This last is not yet introduced to our collections. The late lamented Dr. W. Harvey found *D. grandiflora* luxuriating on a table-mountain close to the margin of a stream which always contained water, but which overflowed its banks in winter. When the plant flowered it was shaded by the herbage and other vegetation in such a way that only the flowers peeped out at the sun. Its roots would find a congenial coolness in the spongy banks, while the canopy of overhanging vegetation would prevent the foliage of the *Disa* from suffering from the blazing sun of lat. 33° S. In cultivation *Disas* should be planted in rough fibrous bog-peat and coarse river sand, using well-drained pans, and then it is next to impossible for anyone to supply them with too much moisture, either at the root or in the atmosphere of the house or pit where they are grown. They must always occupy a shady position in the house. *D. grandiflora* is remarkably well-grown at Ferniehurst, near Bradford, by Mr. E. Culley, gardener to E. Salt, Esq., but the strongest plant I ever saw was in the little known but really excellent collection of Miss Barre, Park Road, Liverpool. This was the true *D. grandiflora superba*.

D. grandiflora.—Foliage dark-green, shining. Stems from two to three feet high, two to five flowered. Flowers light rose, scarlet, and gold. When well grown this is one of the handsomest Orchids we have, and should be in every collection of "cool Orchids." Heat and a dry atmosphere are fatal to its growth and beauty. It blooms in July and August, lasting a long time.

a. D. grandiflora superba is a finer coloured variety.

D. macrantha.—Foliage dark-green; flower-stems erect, from two to three feet high; flowers from two to four inches across. In colour the flowers of different varieties vary from pure white to the deepest rose, blotched or spotted with crimson.

Epidendrum.

This is a very large genus of South American epiphytes, most of which bear dirty white or dingy yellow flowers, still some species are very handsome, and the majority of them are fragrant. They are for the most part of easy culture.

**E. atropurpureum* (Mexico, 1836).—A free-flowering and very showy species. Its roundish or conical pseudo-bulbs are two-leaved. Leaves six to twelve inches long and very leathery. Sepals and petals dark rose or purple, the apices greenish, incurved. Lip rose coloured, with a dark blotch of crimson purple in its centre. It grows well either in a shallow pan or on a block with living sphagnum, suspended near the light. It lasts two to three months in perfection—May, June. It is also known as *E. macrochilum*.

**a. E. atropurpureum album* is a light-coloured variety.

**b. E. atropurpureum roseum*, has a deep rosy purple lip.

**E. aurantiacum*.—A native of Mexico and Guatemala, where it is found growing on rocks in exposed localities. In habit

it resembles *Cattleya Skinneri*. Flowers from the apex of the bulbs, five to ten in a cluster on a short spike, and of the brightest orange scarlet colour, very showy. It flowers in April and May, lasting a month or six weeks in beauty. There are two distinct varieties of it in cultivation.

E. Frederici Gulielmi.—This is a rare and very beautiful Peruvian species introduced by the energetic M. Linden. Stems erect, leafy. Leaves six to eight inches long, one to two inches broad, dark green; panicle terminal, sepals and petals about an inch long, lanceolate, of a deep crimson colour. Lips trilobed, crimson in colour, the apex of the column and the disc being pure white. It is a free blooming species and very effective when well grown.

E. myrianthum.—This is a free-flowering Orchid, very distinct in habit, a native of Guatemala, where it is found in elevated localities. Stems three to four feet high, as thick as a pipe stem. Foliage distichous, linear-oblong or lanceolate; flowers, small, of the brightest rosy lilac in dense panicles at the extremity of the slender flower-stems. There was a fine specimen of this at Manley Hall, near Manchester, which flowered in October and November, 1872.

**E. nemorale*.—This is a beautiful, though rare Orchid, which has often been figured and erroneously called *E. verrucosum*. It was introduced from Mexico in 1840. Pseudo-bulbs from three to five inches high, two-leaved; flowers freely produced on large, drooping panicles; individual flowers three inches across; sepals and petals lanceolate, of a delicate mauve or rosy lilac colour; the lip striped with violet; flowers about July, lasting a month.

**E. prismatocarpum* (Central America).—Pseudo-bulbs in shape somewhat resembling those of the old *E. cochleatum*, of a bright, shining green colour, two-leaved; spikes ter-

minal, erect, bearing from ten to twenty flowers; individual flowers an inch and a half across, of a creamy white colour, spotted with dark purple; lip white, tinged with pink, and having a triangular blotch of crimson purple; flowers in June and July, lasting a month or six weeks in beauty.

E. vitellinum (Mexico, 1840).—This showy species is one of the best in the whole genus, bearing a profusion of bright orange-scarlet flowers; some varieties bear flowers two inches across, and ten to fifteen on an erect spike. The foliage of this plant is glaucous, like that of *Cattleya citrina*; it grows freely in peat and sphagnum, placed in a shallow pan, and suspended near the light in a cool house. It is a splendid and compact exhibition plant when well grown, good specimens producing from twenty to thirty spikes of glowing scarlet flowers, which last good at least a month or six weeks.

a. E. vitellinum majus is one of its most distinct and best varieties. A fine plant of it, in the collection of F. B. Dodgeson, Esq., of Blackburn, has been exhibited with twenty-five fine spikes on it.

Eriopsis.

This is a small genus of South American sub-terrestrial Orchids not often met with in collections; in their native habitats they are found on the margins of streams, their roots often descending into the water; they require a moderate temperature, with a copious supply of water when growing; they grow best potted in fresh peat and living sphagnum.

**E. biloba*.—This plant has been recently imported, and is very distinct in habit; pseudo-bulbs from five to eight inches, or even more, in length, conical, of a dark brown colour, corrugated like shagreen leather, and bearing from two to three broad lanceolate leaves at their apices; flower-spike a foot to eighteen inches long, curved or drooping; flowers

about an inch across, sepals and petals oblong, dark yellow, shaded round their margins with warm brown; lip three-lobed, yellow, speckled with brown, the central lobe white, with brown blotches. The plant is not showy, but distinct, grows freely, and lasts a considerable time in flower. It is also known in gardens as *Eriopsis rutibulbon*, having been sold at Stevens' under that name.

Goodyera.

This is a genus of but few species, which are generally found in northern habitats or high altitudes. Several are grown in gardens, but *G. discolor* is the best. One species, *G. repens*, is found in Scotland.

G. discolor.—A native of China, and often met with in gardens. When well grown it is a very pretty plant. Leaves 2 inches long, 1 inch broad, of a rich dark velvety-green colour, having interrupted longitudinal white stripes more or less distinct. Flowers in the winter, bearing numerous erect spikes of pure white flowers, with a lemon-yellow blotch on the lip, which is curiously twisted or contorted. This plant grows freely in peat and sphagnum, requiring a cool temperature and abundant moisture. It is occasionally known as *Hæmaria discolor*.

G. macrantha.—This is a Japanese species with dark-green leaves, and long tubular flowers, white shaded with rose towards the base.

a. G. macrantha foliis luteo-marginatis.—This is a very pretty plant, you will find, if you can overlook its terribly long name. The leaves are ovate, of a dark velvety-green colour, reticulated with lighter green, and having bold yellow margins. When well grown in peat and living sphagnum Moss, it is extremely pretty, putting one in mind of some of the best of the yellow variegated *Hederas*.

G. velutina.—A handsome velvety-leaved species, in habit very much resembling *G. discolor*, but the leaves are smaller and more numerous, of the same dark velvety-green, but in addition having a well-defined silvery streak down the centre of each. Flowers white shaded with rose or salmon, rather smaller than those of the last-named species.

Helcia.

H. sanguinolenta (Ecuador).—This old plant is rarely to be met with in our collections. It is nearly related to the *Trichopilias*, from most of which it may be at once readily distinguished by its having a flat lip. Pseudo-bulbs ovoid, two inches high, one-leaved. Leaves leathery, oblong, and from four to seven inches long. Flowers two inches across, solitary, on slender scapes from three to four inches long; sepals and petals pale yellow, marked with irregular blotches or rather rings of brown; lip white, blotched with purple on the disc. Clinandrium, or anther-bed, fimbriate, as in *Trichopilia* proper.

Lælia.

This is a strikingly handsome genus of American pseudo-bulbous epiphytes well known in gardens. Like their relatives, the *Cattleyas*, they bear great showy flowers. They grow freely in peat, sphagnum, and crocks, in a moderate temperature, and many are doubly valuable as winter-flowering plants. The larger species, as *L. purpurata* and *L. superbians*, do best in pots; other smaller growing kinds, as *L. albida*, *L. autumnalis*, *L. furfuracea*, *L. acuminata*, and the grand "Flor de Maio" of the Mexican Spaniards, do best upon blocks. *L. Jongheana* is a small-growing but very beautiful species, said to be strikingly beautiful. In habit it comes very near to *Cattleya* (*bulbosa*) *Walkeriana*. Most of the *Lælias* are useful for the decoration of apartments.

L. acuminata (1840).—Pseudo-bulbs rather roundish in

outline, and flat, bearing one thick oblong leaf. Flowers from five to six on a spike, twelve to eighteen inches long; sepals and petals pure white; lip white, with a purple blotch on the disc; individual flowers from one to two inches across. This plant is called the "Flor de Jesu" by the Guatemalese, on account of its purity. It flowers freely in January or February, lasting from two to three weeks in perfection.

a. L. acuminata violacea.—This is a pretty form of the above, with delicate rosy-violet flowers.

L. albida (Guatemala, 1838).—This is a free-flowering species, similar in habit to the beautiful *L. autumnalis*. It grows well on a block of "virgin cork" or Acacia. Flowers borne on a slender scape from one to two feet long; individual blooms one and a half to two inches across; greenish when they first expand, afterwards becoming a clear white; lip white, with a streak of lemon-yellow on the disc. Flowers in December or January, lasting a month or five weeks. Like the last, its crystalline flowers are useful for bouquets, as they remain fresh a long time after being removed from the plant.

L. anceps (Mexico, 1834).—Pseudo-bulbs from four to six inches long, angular, one leaved; leaves oblong, dark green. Flower-scape from two to four feet long, four or five flowered; flowers from two to four inches across; colour rosy lilac, with a crimson velvet lip, having a golden trilobed crest down its centre; flowers perfumed, lasting for four to six weeks in perfection. Strong plants produce an abundant supply of bloom in December.

a. L. anceps Barkeriana is a richer coloured variety but scarce.

b. L. anceps Dawsoni.—This is a strikingly beautiful variety of the normal type, from which it differs in having pure white sepals and petals, and a white lip, with a bright purple blotch on its apex. A rare and desirable plant.

L. autumnalis (Mexico, 1836).—In habit something like *L. anceps*, but its bulbs are two-leaved and not so angular, and its leaves are narrower. Scapes from one to two feet long, bearing from two to five flowers of a light but bright rosy lilac colour, with a rich crimson-purple lip. This is one of the best of winter blooming Orchids, and is most deliciously perfumed. Flowers in November or December, lasting about three weeks in perfection. Does best on a block with living sphagnum, and plenty of moisture when growing. At Manley Hall, Mr. Petch used to have this fine species in a Vinery, fully exposed to the sun, except the slight shade afforded by the Vines. One plant on a block was a remarkable one, and I have counted as many as twenty-three spikes on it, some being as thick as a strong goose quill.

L. cinnabarina (Brazil, 1836).—A very brilliant-flowered species. Pseudo-bulbs, thick and rounded at the base, tapering upwards. Leaves from four to six inches long, recurved. Scape erect, from twelve to eighteen inches high, bearing from three to five rich orange-scarlet flowers, with a crispy lip. The bright orange-coloured flowers seem to warm up the whole house in which it flowers, which it generally does very freely about March, lasting six weeks. It is easy to grow, and should be in every collection.

* *L. elegans*.—A distinct species, with tall, fluted, pseudo-bulbs; from one to two feet high; two-leaved. Flowers from two to three inches across, borne on a stout erect scape; sepals and petals white, shaded with delicate rosy lilac; lip brilliant crimson-purple. A very strong-growing and free-flowering species, sometimes called *Cattleya elegans* in gardens.

**a.* *L. elegans Turncrii*.—This is a very richly coloured form of *elegans*.

L. flava.—Habit similar to that of *L. cinnabarina*, but rather smaller, and the leaves are shorter and more erect. Scapes

from twelve to eighteen inches high, bearing from three to five flowers, individually two inches across, and of the most brilliant golden-yellow or orange colour imaginable. It flowers about April, and lasts fully a month.

L. furfuracea (Mexico, 1838).—Somewhat similar in habit to *L. autumnalis*; but its bulbs are generally one-leaved. Scape rarely bears more than two flowers, which are from three to four inches across. It is easily known from *L. autumnalis* by its much broader petals. The whole flower is of a glowing rosy-purple or bright-lilac colour, with a darker lip. It flowers in the winter, and lasts from three to four weeks. It blooms freely, and is a desirable plant, far superior to *L. autumnalis* when well grown. Should be grown on a block, and suspended near the light. All the autumnal *Lælias* come much brighter coloured, and the flowers last better, by being fully exposed to what sun we get in our dull winter months.

* *L. Jongheana* (Brazil).—A splendid and comparatively recent addition to this already wealthy genus. Its pseudobulbs closely resemble those of *Cattleya bulbosa*, but have only one silver sheath, and one joint at the base. *C. bulbosa* has two well-developed sheaths, and is jointed in the middle. Flower-spike one to two flowered; flowers from four to five inches across; sepals lanceolate, two inches and a half long, of a beautiful bright amethyst-purple tint; petals ovate or oblong, nearly two inches broad, with slightly wavy margins of the same colour as the sepals; lip having pale purple lateral lobes yellowish outside, golden yellow within, having seven lamellæ or plates over its disc; the central lobe is of a pure white, with a narrow margin of the brightest amethyst purple. The colours in this superb species contrast most vividly with each other, forming a grand *tout ensemble*, rarely surpassed.

L. Lindleyana.—This is a very distinct plant, in habit as well

as in flower; pseudo-bulbs erect, slender, from six to nine inches high, bearing two thick, but narrow, glaucous leaves from five to seven inches long; peduncles one to two flowered; sepals and petals two inches long, lanceolate, white or pallid rose colour; lip rosy lilac, pale creamy-yellow, blotched and streaked with pale purple on the disc. The glaucous leaves and pallid flowers of this species are very characteristic. It flowers freely, lasting from three to four weeks in perfection. (Called also *Cattleya Lindleyana*.)

L. majalis (Oaxaca, 1838).—This is the “May Flower,” or “Flor de Maio,” of the Mexican Spaniards, and one of the most beautiful species in the genus; though, unfortunately, it does not flower so profusely as the other species do. It is of dwarf habit, having pseudo bulbs as large or larger than pigeons’ eggs; flowers from four to five inches across, of a bright silvery lilac, the lip blotched with crimson purple, and margined with rosy lilac; centre white. Should be grown in a cool house, and fully exposed to the sun all the year round, suspended near the glass. Does best on a block in an airy situation.

**L. Perrini* (Brazil).—A well-known species, easily recognised when not in flower by its purplish-coloured clavate pseudo-bulbs, which are furrowed distinctly; leaves narrow, from nine to twelve inches long; sepals and petals rosy purple; lip deep crimson purple. Flowers very freely about October or November; lasting about a fortnight in beauty.

L. præstans.—A beautiful dwarf species, blooming twice in the year, like *C. bulbosa*; sepals and petals rosy lilac; lip crimson purple; flowers solitary, very rarely two together. This is not a common plant, though a very desirable one; flowers about April and May, and lasts a considerable time. The sepals and petals lie very flat, that is in the same plane, giving a distinct appearance to the flower. Grows freely

on a flat log, in living sphagnum moss, and requires an abundant supply of moisture when growing.

L. crispilabia.—I had nearly forgotten to mention this free-blooming plant, which also goes under the name of *L. Lawrenceana* in some gardens. In habit it approaches *L. cinnabarina* and *L. flava*, but has rosy purple flowers, the lip being beautifully crisp or undulate; flowers from three to five, on a scape from twelve to sixteen inches long, lasting a long time in beauty.

**L. pumila*.—We have here another dwarf-growing plant, often known as *Cattleya Pinelli*. It has solitary rosy purple flowers and a richly tinted crimson purple lip; grows well on a block or in a shallow pan, suspended near the roof.

L. pumila marginata.—This is identical with *Cattleya marginata*.

**L. purpurata* (Brazil).—This is one of the noblest of all Orchids for exhibition purposes, good plants bearing from twenty to thirty glorious flowers, from six to eight inches across; sepals and petals rosy lilac; lip crimson, veined with crimson purple, and having a yellow throat, delicately pencilled. It is common and cheap, but none the less beautiful; indeed the price of Orchids is no sure guide to their beauty or real value to the cultivator, though it is a tolerably correct index as to their rarity. *Lælia purpurata* grows best in a pot in coarse, fibrous peat, fresh sphagnum moss, crocks, and charcoal being freely interspersed. The pot should be half-full of crocks for drainage, and the plant watered freely when making its growth. It flowers in May, June, and July, or just about the time when the summer shows are held. Its blossoms last from two to three weeks.

L. superbiens.—This is a large growing plant, seldom producing more than from one to two spikes of bloom annually; still it is attractive, and easily grown; pseudo-bulbs spindle-

shaped, bearing two large, leathery leaves ; flower spike from five to ten feet long, the flowers being borne in a cluster of from five to twenty near its apex ; flowers from five to six inches across, of a deep, rosy purple, veined with crimson ; lip yellow and crimson purple, delicately pencilled ; the flower-spikes are a long time in arriving at maturity. It is doubly valuable on account of its flowering during the dullest part of the year—December and January. Lasts from three to four weeks in perfection. This plant, when not in flower, cannot be distinguished from *Schomburgkia crispa*.

**L. xanthina* (Brazil).—This is a distinct and easily-grown variety ; pseudo-bulbs clavate, from nine to twelve inches high, one and two-leaved ; peduncles erect, five to seven flowered ; flowers from two to three inches across, of a clear, golden-yellow colour ; lips whitish, with orange streaks on the disc. Remarkable among the *Lælias* as bearing yellow blossoms ; flowers in the summer, lasting a month in bloom. Sometimes called *Cattleya xanthina*, but it is a true *Lælia*.

Leptotes.

**L. bicolor* (Brazil, 1831).—A pretty little plant, having thick, fleshy leaves, like rushes, channeled above. These leaves are sometimes glaucous, and generally drooping. It is a plant of very free growth, doing well either on a block or in a shallow pan suspended near the light. Flowers numerous, white, the sepals and petals being linear and incurved ; lip, three-lobed, the lateral lobes being serrulate, the central lobe rhomboid, and blotched with rosy lilac. Blooms in winter, and lasts a month.

Lycaste.

This is a well-known genus of terrestrial Orchids, from the South American continent, many of them very beautiful, and all of the easiest possible culture. *L. Skinneri* is one of the best of them, as well as one of the most variable of Orchids. The genus is very nearly allied to *Maxillaria*.

L. aromatica (New Granada).—This is a very free-flowering species, producing numerous yellow flowers in the winter and spring. Lip, very hairy. It is very common, and of the easiest possible culture. Flowers last four or five weeks.

L. cruenta (Guatemala).—Another free-flowering species. Sepals greenish yellow; petals deep orange; lip deep orange, blotched with crimson. It will grow freely in a vinery, or even in the greenhouse, and may be relied on for bearing a good crop of its golden flowers, which last for a month, even if the plant be removed to a drawing-room.

L. Deppei (Guatemala).—A distinct species, though not strikingly beautiful. It bears numerous pale greenish-yellow flowers blotched with brown; lip white, spotted with crimson, having a golden yellow crest. Blooms very freely and lasts a long time.

L. gigantea (Central America).—A large-growing species, bearing great green flowers having a purple lip; sepals and petals from three to four inches long, green shaded with brown; lip of a deep purple colour, margined with rich orange, serrated; column white. This is a distinct and free-flowering species, but not at all showy. Lasts a month or six weeks in flower.

L. Harrisoni (Brazil, 1838).—Pseudo bulbs olive green, wrinkled transversely, and angular, bearing a solitary dark green leaf, broadly lanceolate in form, and wavy along its margins. Flowers large, waxy, from one to three on a stout scape; sepals and petals concave, white or creamy yellow; lip rosy purple, and very hairy. Blooms nearly all the year round, and lasts a long time in flower. The plant, when in bloom, may be removed to the sitting-room without the least hesitation, as, if the atmosphere is kept above freezing, all will be well.

**L. lanipes*.—Pseudo bulbs large, one to three leaved; leaves

lanceolate, from twelve to eighteen inches long. Flowers produced from the base of the ripened pseudo bulbs, solitary, on scapes from six to nine inches high; sepals and petals creamy white; lip white, ciliated or fringed along its margin. South America; blooming in October. This is often met with in collections as *Lycaste Barringtoniæ*.

L. Skinneri (Guatemala, 1842).—One of the most profuse flowering Orchids we have, and very easy to cultivate. It sports into numerous distinct and beautiful varieties, varying in colour from the purest white to the deepest rose and crimson, and though essentially a winter-flowering Orchid, some of its varieties bloom during the summer. Flowers from four to six inches across, solitary, on scapes six, nine, or twelve inches high; sepals and petals white, more or less suffused with rose; lip rosy lilac, often very heavily blotched with the deepest rosy crimson. This plant generally flowers from November to March, and lasts in flower from two to four months. It is one of the best of all Orchids for the decoration of apartments, as it will keep in perfection in a drawing-room vase for a month or six weeks. Even its flowers when cut last several weeks, and are very lovely mixed with Ferns and other exotics. The flowers are very delicately perfumed, and are admirable for the decoration of ladies' hair.

Masdevallia.

This is a large genus of very cool Orchids, many of which come from the higher ranges of the Peruvian Andes, where they luxuriate in cool, moist localities. They are of the easiest possible culture, growing and producing abundant crops of their curious trifid, caudate blossoms nearly all the year round. They should be placed in small pots in a compost of fibrous peat, fresh sphagnum, crocks, and a little fibrous loam—that which has been sifted and the fibrous lumps only retained being best. They will be found to luxuriate in

the coolest end of the house in company with *Disas*, *Oncidium macranthum*, and the *Odontoglots*; and their glowing lilac and bright orange-scarlet and purple flowers form an agreeable contrast to the pure snowy white and golden-yellow *Odontoglots* and *Oncids*. The best of all are *M. Veitchii*, *M. Lindenii*, *M. Harryana*, *M. tovarensis*, *M. coccinea*, and *M. maculata*, but some of the best have yet to be introduced to our collections.

M. civilis.—Leaves four to six inches long, fleshy. Flowers having their sepals fused into a tube, terminating in three slender tails; green in colour, spotted inside with brown.

M. coccinea.—This beautiful species has been introduced some years, and is very pretty, having flowers of good substance, and to use the words of Lindley, "as red as a soldier's coat." It is rather smaller in growth than the other species.

M. Harryana (New Granada).—This is a recently introduced plant, and one of great beauty. It appears to be of strong growth, imported leaves being from 12 to 16 inches long. Flowers of good size borne singly on slender scapes; sepals of the richest rosy-purple or crimson-lake. This plant is somewhat similar in colour to *M. Lindenii*, but darker, and the flower is larger. Mr. Denning, gardener to Lord Londesborough, exhibited a fine variety of it, at South Kensington, in June 1872. From the evidence of several growers, this species seems to be a continual bloomer. Its richly coloured flowers are well adapted for cutting and for using in bouquets.

M. ignea.—This is another distinct species from New Granada, bearing glowing orange-scarlet blossoms very freely. Like the last, they are solitary, on long slender scapes. This species flowers even more freely than *M. Harryana*.

M. Lindenii.—This is one of *M. Linden's* many introductions from the great continent of South America. Its leaves are spatulate, as in the other species, and the flowers are of a

lovely pale silvery-lilac colour, some varieties merging into rosy-purple, but all retaining a wonderful transparency of colouring. Its flowers are rounder and the segments shorter than those of *M. Harryana*. It appears to be very rare, but may be expected to turn up promiscuously among batches of imported plants from time to time. In common with the other species of the genus, it grows vigorously in the cool house, surrounded by living sphagnum, and plentifully supplied with moisture.

M. tovarensis.—This is a little gem, its flowers being of snowy whiteness, borne in pairs, or more rarely in threes, on a short triquetrous scape. The caudate appendages of the lateral sepals cross each other in a curious manner. The old flower-spikes, if allowed to remain, will continue to produce flowers successively, in a manner analogous to the old *Hoya carnosa*. It is easily recognised by its pearly blossoms.

M. Veitchii.—This still remains the handsomest of all the *Masdevallias* at present introduced to our gardens; its leaves are a foot or more in length; flowers of large size, singly, on scapes, from twelve to eighteen inches high; sepals fused into a campanulate tube, their extremities narrow or caudate; the colour is a brilliant orange, the lower sepals being densely beset with bright purple hairs, which, mingling with the orange beneath, give an indescribable brilliancy to the flower. Like the rest of the species, it keeps on growing and flowering all the year round.

Maxillaria.

**M. grandiflora* (Lindley, Peru).—This must be considered one of the finest species of the genus, and one that will well repay any trouble or extra care in its cultivation; pseudo-bulbs roundish, two inches high; one-leaved; flowers solitary, on scapes from four to nine inches high; sepals from

one-and-a-half to two inches long, and from three quarters to one inch broad, not acuminate, like those of *M. venusta*, but, like those of the last-named species, they are of the most delicate ivory whiteness; petals smaller, also pure white; lip three-lobed, streaked with yellow on the lateral lobes, and blotched with crimson inside; central or intermediate lobe lemon yellow. A free-growing plant, as rare as it is beautiful.

**M. venusta*.—This is a noble Orchid, yet seldom cultivated. It is a native of New Granada, at an altitude of from 5,000 to 6,000 feet; pseudo-bulbs, two-leaved; leaves linear, oblong, light, shining green. Flowers borne solitary, on stout scapes; sepals and petals three inches long, acuminate, of the most snowy whiteness; lip lemon yellow, streaked with red. A very easy plant to grow, and one that remains in flower a long time.

Miltonia.

A genus of Mexican and Brazilian Orchids, generally profuse bloomers, and of the easiest possible culture. The flowers are very useful for cutting; they grow freely in peat and sphagnum moss, in well-drained, shallow pans, and require a good supply of moisture when making their growth. Miltonias naturally have a pallid appearance, but they become much greener if well supplied with moisture when growing. They grow freely in the warm end of the cool house; some, as *M. spectabilis* and its varieties, being dwarf, may be hung close under the glass. All the Miltonias are beautiful, especially *Warscewiczii*, *Morelliana*, *Regnelli*, and *candida*.

**M. candida* (Brazil, 1832).—A fine old species not commonly met with, but well worthy of cultivation. Its flowers are large and handsome, readily distinguishable from those of its congeners by its lip being convolute, not flat or expanded, like that of

M. spectabilis, for example. Flower-stems erect, from twelve to eighteen inches long, bearing from five to ten flowers three to four inches across. Sepals oblong, pale yellow, barred with chestnut brown, not unlike some *Odontoglossa*; lip convolute, white, with a lilac or purple blotch on the disc. The clinandrium, or margin of the anther-bed, is lacinate, or rather fimbriate, in the same way as in *Trichopilia*. This plant flowers about October, and lasts for two or three weeks in beauty.

**a. M. candida grandiflora*.—This is a fine variety, having larger and brighter coloured blotches on its flowers. It grows vigorously in a cool or intermediate house along with many of the *Cattleyas*.

**M. Clowesii* (Brazil, 1840).—Pseudo bulbs from five to seven inches long, tapering upwards, two-leaved; leaves from twelve to sixteen inches long. Flower-stems from one to two feet high, bearing from five to fifteen large flowers, three or four inches across; sepals and petals oblong, one and a half to two inches long, half an inch broad, of a deep yellow colour, barred with chestnut brown. Lip white, with a violet blotch across the centre. It is a striking plant when well grown, suitable for autumn shows. The white lip of this and one or two other species changes to a yellow colour after the flowers have been expanded some time.

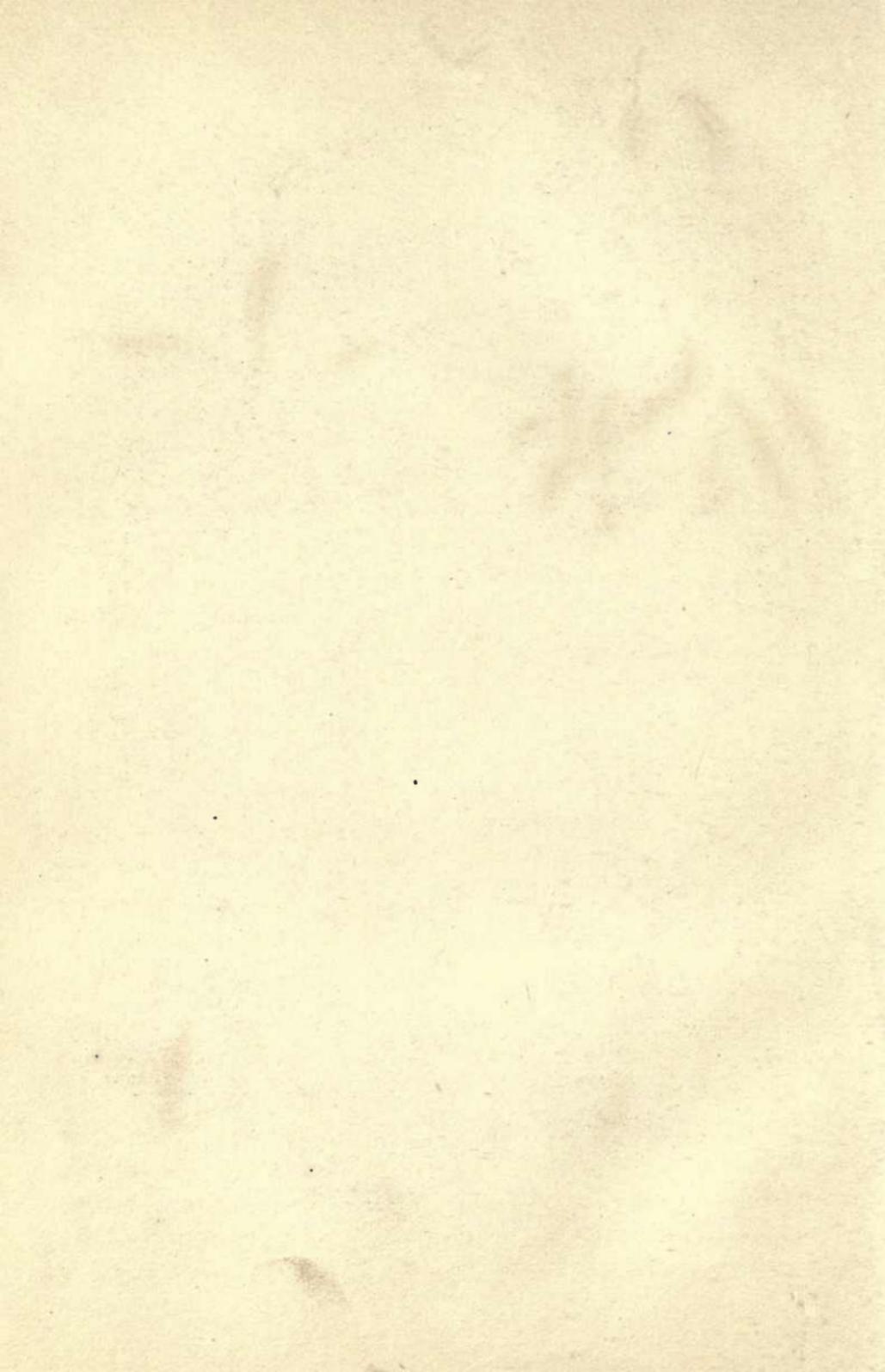
**a. M. Clowesii major*.—This is a garden variety, having larger flowers.

**M. Regnelli* (Brazil).—A very delicately coloured species, and generally considered one of the best in the genus. In habit it is like a weak variety of *M. Clowesii*, and the flowers are borne several together on an erect spike in the same manner; but the flowers are far more chaste, having pure white sepals, and petals an inch long, and a white lip, the centre of which is



Vincent Brooks Day & Son Imp.

1. *Miltonia Warszewiczii*.
2. *Oncidium superbiens*.
3. *Laelia furfuracea*.
4. *Barkeria Lindleyana* v *Centera*.



suffused with deep lilac, or in some varieties bright purple colour. This is a rare and beautiful species, flowering in August and lasting from five to six weeks.

**M. spectabilis* (Brazil, 1835).—Of all the *Miltonias* this is by far the best known species; indeed we often meet with it struggling for existence in all manner of out-of-the-way places in gardens. Pseudo-bulbs smooth, compressed, two-leaved. Flowers solitary, borne on a scaly flower-stem from six to nine inches high; sepals and petals creamy-white; lip broad and flat, cuneate or wedge-shaped in outline, white with a large blotch of lilac or purple near its base. This species and its varieties are often grown in large flat pans for exhibition purposes. They grow freely in peat, sphagnum, and crocks. Good specimens bear from thirty to fifty flowers. Blooms in August, and lasts from three to four weeks.

**a. M. spectabilis Morelliana*.—This is often called *M. Morelliana* or *M. atro-purpurea*, but it is undoubtedly nothing but a highly-coloured form of *M. spectabilis*. The whole flower is of a deep rich purple colour; it grows quite as freely as its congener, and makes a striking plant for the autumn exhibition.

**b. M. spectabilis rosea*.—This is a garden variety, having a fine deep rosy lip. It is sometimes called *M. Warneri*.

**c. M. spectabilis virginalis*.—We have here a delicate variety, which differs from the normal type in having its sepals and petals of snowy whiteness, and its lip is pure white, with the exception of a small lilac blotch beneath the column.

**M. Warscewiczii* (a native of Peru).—Pseudo-bulbs from six to eight inches long, very flat, with sharp edges, two-leaved; leaves from twelve to eighteen inches long, erect. Flower-spike, or rather panicle, erect or nodding, and bearing from ten to thirty flowers. Flowers one and a half inch across;

sepals and petals oblong, with sinuose or wavy margins, of a warm brown colour tipped with golden yellow; lip broad and rather wedge-shaped, the basal half being of a dull violet-purple colour, the apex tipped with white. This is a very easily grown plant, and grows well in an intermediate or cool house.

Mesospinidium.

M. sanguineum (Amazon).—Pseudo-bulbs oblong or obovate; two-leaved. They are often marked with transverse brown bars; leaves from twelve to sixteen inches long and half an inch broad. Flowers deep rosy crimson, borne on a long, flaccid, slender panicle; sepals and petals one-third to half an inch long; the lateral sepals connate, or fused together for half their length; lip white, bent at right angles with the column, to which it is closely adnate or pressed; crest white, bilobed. When well grown, this plant bears numerous spikes of lively-coloured flowers, and they last a long time in beauty.

M. vulcanicum.—This has been introduced somewhat recently, and appears to be a nice addition to the cool house. Its bulbs are ob-pyriform, compressed, two-leaved; leaves rather thick, lanceolate; panicle bearing numerous rosy-purple or crimson Epidendroid flowers, larger than those of its congener, *M. sanguinea*.

Nanodes.

N. medusæ.—One of the most curious of all Orchids, and very rarely to be met with in our collections. Its pseudo-bulbs are thick and fleshy, about a foot long; leaves distichous, of a glaucous tint, and curiously twisted. Flowers generally in pairs, borne near the apex of the growth; sepals and petals oblong, of a greenish colour shaded with brown; lip roundish in outline, its margin deeply lacinate; the colour of the lip is a





1. *Odontoglossum Uro-Skinnerii*
 2. " (*erosum*) *stellatum*.
 3. " *maculatum*
 4. *Oncidium Phalanopsis*

crimson maroon, and it appears very beautiful when held up to the light; grows best in sphagnum, on a block.

Nasonia.

N. punctata.—We have here a little plant that would easily go into a fusee-box; still it is worth growing, and is nearly always in flower. Stem erect, only an inch or two high; leaves thick and fleshy, half an inch long, somewhat triquetrous. Flowers borne on slender pedicels in the axils of the leaves; sepals and petals of a bright orange-scarlet colour, only about a quarter of an inch long; lip bright golden yellow, with a brown spot in the centre; grows well in peat and sphagnum. (Also known as *N. cinnabarina*.)

Odontoglossum.

Of this genus there is scarcely a single species that is not worth growing. All are beautiful, and they are daily gaining ground in the estimation of the Orchid growing and plant-loving public. Although natives of the tropics or equatorial regions, still, as observed by Mr. Bateman, one of the first promulgators of cool Orchid growing, there is not a single species found growing in the sultry tropical lowland plains. All affect the cool, airy ranges of the Cordilleras of Mexico, New Granada, and Peru, where they grow and flower profusely. A cool and moderately airy atmosphere, with abundance of atmospheric moisture, is essential to their welfare. We are sometimes told that they will grow in the ordinary greenhouse, but that is a mistake. It is true they will grow in such a structure, but not long. They do not require more heat than ordinary greenhouse plants, but they want a great deal more atmospheric moisture, or the energy of the plants would soon be lost by evaporation; and to prevent this taking place we must keep the house closer, and employ more shading

material than is generally considered sufficient for greenhouse plants.

O. Alexandræ (Bateman, Bogota).—This superb member of the genus is identical with the *O. crispum* of Lindley, but will probably retain its present name in compliment to England's future Queen. Sepals and petals from one to two inches long, often an inch broad, of the purest white, rarely spotted with rose; lip white, with a blotch of lemon yellow on the crest, and spotted with rose below. The flowers of this species vary very much in form and colouring. It is one of the loveliest of bridal Orchids, and a small spike of flowers, tastefully arranged on a frond of *Adiantum Farleyense* or *A. macrophyllum*, forms a natural wreath or tiara that even Venus herself would be proud to wear. The plants may be removed to the drawing-room or used for the decoration of the dinner table, with impunity; provided the temperature of the room does not fall below 40°, no harm will be done. This plant is also called *O. Bluntii*. It flowers nearly all the year round when grown in quantity, producing an abundance of flowers.

O. Andersonianum (New Granada).—This is like *O. crispum* in shape, or like a narrow-petaled form of that plant, of a creamy white colour; the lower halves of the sepals and petals are streaked and spotted internally with reddish brown; the lip is also similarly marked, the upper part being yellow.

O. aureo-purpureum (Rechb. fil., N. Granada).—This is said to be a noble plant, but I believe it has never flowered in this country. It inhabits a very cold region, and is described as bearing many-flowered spikes of golden yellow flowers spotted and blotched with rich purple. It is sometimes, though erroneously, referred to the well-known *O. luteo-purpureum*.

O. angustatum.—A pretty little species; pseudo-bulbs two-leaved; panicles from one to two feet long. Flowers small, from fifty to one hundred on a spike, about one inch across;

sepals and petals lanceolate, pale yellow spotted with brown; lip with a blotch of lilac across its centre. A variable plant, sporting into one or two tolerably distinct varieties.

O. Bictonense.—A very free-flowering species, though not strikingly handsome. Flower-spikes about two feet high, bearing from twenty to thirty flowers. Flowers one and a half inch across; sepals and petals are greenish-yellow, barred and blotched with brown; lip white, suffused and shaded with pale lilac or rose colour. April, lasting a month.

a. O. Bictonense superbum.—This has sepals and petals heavily blotched with rich crimson-brown, and a deep-coloured rosy-purple lip.

b. O. Bictonense album.—This has a pure white lip. The flower-spike of this species often bears foliaceous bracts instead of properly developed flowers.

O. blandum (N. Granada).—This is a pretty white-flowered *Odontoglot* in the way of *O. nævium*. Like the last-named species, its flowers are heavily spotted with purple-brown, but its lip is larger than even that of *O. nævium majus*.

O. Cervantesi (1845).—A dwarf-growing species, having angular pseudo-bulbs, and lanceolate solitary leaves. Spikes six inches high, three to five flowered. Flowers from one to two inches across; sepals and petals rosy-lilac, barred at the base with crimson-brown; lip cordate or triangular, white or lilac. This is a pretty but not showy species; generally flowers freely about March or April, lasting a month in beauty.

O. Cervantesi membranaceum.—This is often met with in gardens under the name of *Odontoglossum membranaceum*, but it is only a large-flowered form of *O. Cervantesi*. The best variety of this group is *O. membranaceum roseum*, another deep-rosy large-flowered form of the old *O. Cervantesi*.

**O. citrosimum*.—This is a good old white-flowered species, the

O. pendulum of Lindley, introduced from Guatemala in 1840; pseudo-bulbs large and shining, two-leaved. Flower-spikes pendulous, bearing from fifteen to thirty large fragrant blossoms. It flowers in May and June, and lasts a month in perfection. This species will be found to grow best in the warm end of the house, among the Cattleyas and Miltonias.

*a. *O. citrosmum roseum.*—A noble form of the above, having large rosy-tinted sepals and petals and a rosy-purple lip. A plant of *O. citrosmum roseum* in the collection of Dr. Ainsworth, of Higher Broughton, near Manchester, has borne fifty-two flowers on a single-branched spike. Mr. W. Mitchell grows this plant, *Miltonia Warscewiczii*, and *Oncidium sarcodes* remarkably well. He has had *O. sarcodes* in a cool conservatory with from fifty to seventy flowers on a spike.

O. cordatum (Guatemala, Mexico, 1837).—Pseudo-bulbs oblong, generally one-leaved; leaves bright green, with yellow lines; scape simple, erect, bearing from ten to fifteen flowers. Flowers from two to three inches across; sepals and petals nearly equal, lanceolate, apices very much acuminate, of a yellow colour, barred and blotched with soft brown; lip cordate, white, with a few brown blotches. This species is very variable in the depth and richness of its markings, and has often been confounded with *O. maculatum*, a totally different species. This is a free-flowering and easily-grown kind, blooming in May, and lasting three or four weeks.

O. coronarium.—This is one of the coolest species we have, coming from the Andes of Peru, at an altitude of 8,000 feet. Its large, wrinkled, flat bulbs are produced at intervals along a creeping rhizome, and bear a short oblong leaf at the apex. Flower-spike erect, from twelve to sixteen inches high, bearing about thirty or forty flowers; sepals and petals bright brown, margins yellow; lip of a bright golden colour. Lasts a long time in flower. This plant flowered in 1872 in

Lord Londesborough's collection, under the care of Mr. Denning, for the first time, I believe, in this country, although it has long been introduced. The flower-spike was borne by the third bulb back, not from the last made growth. This plant bears very cool treatment, and is known in some nurseries and gardens as *O. candelabrum*, and also, more rarely, as *O. brevifolium*. Grows well in peat and moss, in a flat pan suspended near the light. Flowers from March to May.

O. Coradinei.—Professor Reichenbach thinks this may possibly be a natural hybrid between *O. triumphans*—which it much resembles—and one of the forms of which *O. odoratum* is considered the type. Sepals and petals from two to three inches across, of a pale yellow colour, with two or three chestnut brown blotches; lip creamy white, with a large irregular blotch on its disc, and a few smaller spots near its base. The crest of the lip is different from that of *O. triumphans*, and the habit and growth of this plant is more slender. It appears to be a splendid thing, bearing two or three flowers on a spike, but doubtless this number will soon be increased as the plant gets distributed.

O. cristatum (Peru).—This is not so pretty as some of the other species. Its flowers are about two inches across, of a greenish yellow colour, blotched with brown; lip whitish spotted with dingy brownish purple, with a radiating white crest. It flowers freely and lasts a long time in bloom.

O. crocidipterum (New Granada).—A very pretty and free-flowering species, somewhat resembling *O. nævium* or its congener *O. gloriosum* in habit and mode of flowering. Its pseudo-bulbs are compressed and conical, two-leaved; spikes from twelve to eighteen inches long, bearing numerous pale yellow flowers spotted with brown; individual flowers two or three inches across. Its blossoms are delicately scented, like

Hawthorn. The flowers are exactly like those of *O. nævium* in shape, but yellow instead of white; lip having a bilobed white crest, around which is a blotch of clear lemon yellow. Flowers very profusely in August and September, or much later than *nævium*, lasting a long time in bloom.

O. Ehrenbergi (Mexico).—This pretty little species is, in size and habit, very much like *O. Cervantesi*, but its sepals are barred with brown to their apices, while those of *O. Cervantesi* are only barred on their basal half; the lip very much resembles that of *O. stellatum* (*O. erosum*); when a good mass of it becomes thoroughly well established, it flowers freely, and the same may be said of all the species composing this dwarf group.

O. gloriosum (New Granada).—This plant is, in habit, identical with *O. nævium*, from which cultivators distinguish it by its larger branched spikes, and creamy yellow flowers, spotted and blotched with brown, whereas, in the true *O. nævium*, and its fine variety *nævium majus*, the flowers are of snowy whiteness, spotted with purple; sepals and petals from an inch to an inch and a half long, lanceolate, acuminate, incurved, very wavy along their margins; blooms in April and May, lasting a long time in flower. It appears to be a strong form of the group of which *O. nævium* is the type.

**O. grande* (Guatemala).—Truly named, for this is the most gorgeous species of the whole group, and when well grown makes a fine, decorative, and valuable exhibition plant. Its glaucous pseudo-bulbs are thick, slightly angular, two-leaved; leaves from six to nine inches long, broad, lanceolate, and dark green; flower scapes stout, from five to nine flowered; flowers individually from four to seven inches across; sepals and petals oblong, undulate, of a rich golden yellow colour, barred with shining brown; lip pale, creamy white, or yellow, barred with pale brown. When well grown, it often bears from twenty to

thirty expanded flowers at the same time. It is the finest form of the small group, of which *O. Insleayi* and *O. Schlieperianum* are the other species. It is very easily cultivated, and does best, like *Citrosimum* and *Krameri*, in the warm end of the house.

*a. *O. grande superbum.*—A selected garden variety, with fine, richly-blotched flowers.

O. Hallii.—See *O. luteo purpureum*.

O. hastilabium.—This is a strong-growing species, with thick, pale green, fluted pseudo-bulbs, and tall, branched flower-spikes, erect and glaucous; flowers from fifty to one hundred on a spike, from two to three inches across; sepals and petals lanceolate, incurved, pale green, barred with purple or brown; lip purple at the base, white at its apex; the flowers open gradually in succession for many weeks. Blooms about May to July, lasting three months.

O. hystrix.—See *O. luteo purpureum*.

**O. Insleayi* (Mexico, 1840).—A species closely resembling *grande* in habit, but its pseudo-bulbs are more compressed, longer, and fluted; flower-spikes from five to ten flowered; sepals and petals pale green or yellow, barred heavily with brown; lip smaller than that of *O. grande*, and of the most brilliant golden yellow, spotted with crimson. Flowers in November and January, lasting from three to four weeks.

**O. Krameri* (Costa Rica).—A very pretty little species, related to *O. pendulum*. Its pseudo-bulbs are flat, one-leaved; flower-spikes from two to three flowered; flowers rather smaller than those of *O. citrosimum* (*pendulum*), and more delicately tinted; sepals and petals oblong, white, suffused with flesh-colour; lip reniform, of a soft flesh-colour, having a yellow crest, below which occurs two undulating transverse brown lines; the lip is also dotted with purple. Grows well in peat and sphagnum, in the warm end of the house.

O. luteo purpureum (New Granada—altitude 8,000 to 9,000 feet).—This is a very variable species, of which *O. Hallii*, *O. hystrix*, and *O. radiatum* are the most characteristic forms, these, again, becoming merged into the normal type through a long series of but slightly different intermediate sub-varieties. It is a question whether even the grand *O. triumphans* is not an extreme and superlatively beautiful form of this errant species; pseudo-bulbs conical, slightly compressed, two-leaved; leaves ob-lanceolate, often of a bronzy colour; flower-spikes from one to three feet long, sometimes branched; individual flowers from two to four inches across; sepals and petals lanceolate, acuminate, golden yellow, heavily blotched with brown; lip white, spotted with brown, having its margin serrate, and a radiate golden crest.

a. O. luteo purpureum Hallii.—One of the finest forms, having flowers from three to four inches across; sepals and petals crimson brown, tipped and margined with bright golden yellow; lip an inch broad, serrate, white, spotted with crimson; crest radiate, golden, column white, streaked with brown; the sepals and petals are green behind, streaked with brown. A splendid specimen of this variety bore four flower-spikes in the collection of E. Salt, Esq. One of the spikes was from three to four feet long, branched, and bore thirty flowers; it makes a fine plant for exhibition.

O. luteo purpureum hystrix.—This variety is only a selected garden form, and varies from the normal type in colour only. *O. luteo purpureum grande* and *O. radiatum* are also varieties of this species, distinguishable only by the size and colour of their flowers.

O. maculatum (Mexico, 1838).—The habit of this plant is very similar to that of *O. cordatum*, but the flowers are very distinct; sepals lanceolate, yellow, barred with brown; petals much broader, clear golden yellow, with two or three brown

bars at the base only; lip cordate, yellow, not white, as in *O. cordatum*, spotted with brown. It is very different from *O. cordatum* when seen in flower, but it has been confounded with and even figured as that species—April to June, lasting a month or six weeks.

O. membranaceum.—See *O. Cervantesi*.

O. nœvium.—A splendid species, native of the New Granadian Andes. Pseudo-bulbs rather flat, ovoid, wrinkled transversely when old; flowers from ten to sixteen on an arching spike, from twelve to eighteen inches long; sepals and petals an inch and a half long, lanceolate, with wavy margins, of a pure white colour, spotted and speckled with purplish crimson. Flowers in May and June, lasting from four to six weeks. This is one of the finest of all the *Odontogloss*s, and makes a fine exhibition plant when well grown.

O. nœvium majus.—Another and a better form of this species, bearing larger flowers, which are produced in profusion on well-grown plants about April or May. A splendid specimen of it in the collection of F. B. Dodgeson, Esq., of Blackburn, has produced twenty-five flower-spikes, some of them bearing from fifteen to sixteen flowers. There is also a noble example of this plant in the select collection of John Russell, Esq., of Mayfield, near Falkirk, N.B. Both these plants flower very freely, and are in the most luxuriant health.

O. nebulosum (Mexico).—This is a fine large-flowered species, that succeeds perfectly under the coolest of indoor treatment. In its native habitat it is found at from 8,000 to 10,000 feet elevation. Pseudo-bulbs roundish, two-leaved; spikes stout, from five to seven-flowered. Flowers from two to four inches across; sepals and petals from one and a half to two inches long, one to one and a quarter inch broad, oblong, slightly incurved, white more or less spotted with brown; lip cordate, with a lemon-yellow bilobed crest, and a few brown spots.

Flowers from March to May, lasting from three to four weeks.

a. O. nebulosum candidum.—A free-growing form of the above, without the spots on the segments of the perianth, the flowers being pure white, with the exception of the yellow crest, and a few spots of brown on the lip.

c. O. nebulosum pardinum.—This is another form, having flowers as in the normal type, but more densely spotted or blotched with brown. It is sometimes labelled in nurseries and gardens *O. pardinum*, but it is only a more profusely spotted variety of the clouded Odontoglot *O. nebulosum*.

O. nevadense (New Granada).—This beautiful and showy species at the first glance looks suspiciously like the old *O. luteo purpureum*, but it is easily distinguished from it by having simply a bilobed crest, not radiate, as in the last-named. Flowers from two to three inches across; sepals and petals brown, tipped, and margined with yellow; lip white, serrated, with a few spots on its lateral laciniae and round the crest on its disc. It is from the Sierra Nevada, and bears cool treatment like the rest, lasting a long time in beauty.

O. odoratum (New Granada).—A very free-flowering species not a great deal unlike *O. crocidipterum*. Pseudo-bulbs ovoid, two-leaved. Flower-spikes numerous, bearing flowers about one and a half to two inches across; sepals and petals lanceolate-acuminate, of a bright yellow colour blotched with rich brown; lip in form lanceolate-trilobed, not unlike the other segments in colour, excepting the addition of a white bilobed crest. Flowers last a month, and are very fragrant. *O. constrictum* also belongs to this group.

a. O. odoratum, var. latimaculatum.—This form has deep golden flowers, very heavily blotched with bright crimson brown. It is a tolerably distinct form, and very effective when well grown.

O. Pescatorei (New Granada, 1851).—This is a variable, but strikingly beautiful species, similar in colour but rather smaller in habit than its relative *O. crispum*. It is easily distinguished from the latter by its having a distinctly panduriform or fiddle-shaped lip. Pseudo-bulbs thick and speckled with brown, two-leaved; leaves from six to twelve inches long; spikes or panicles from one to two feet long, erect or drooping, and bearing from ten to one hundred flowers; sepals and petals of pearly whiteness; lip white, with bold purple blotches, and a lemon yellow bilobed and serrated crest. Flowers in April and May, lasting three or four weeks, or even more, in perfection. Lord Londesborough has a fine variety of this, bearing flowers three inches across, with very broad segments of great substance. There are also some superb forms of this lovely species in the collection of E. Salt, Esq.

**O. Phalænopsis* (Ecuador, 1850).—A very distinct and beautiful species. Its ovoid bulbs are two-leaved and of a very pale whitish green colour. Leaves slender, Grass-like, pale green or glaucous; scapes slender, one or three flowered, shorter than the leaves; sepals and petals oblong, about an inch long, pure white; lip very large and flat, fiddle-shaped—that is, contracted in the centre, white, with a lilac blotch, and a few purple spots. This species is rather delicate, and will be found to require a warmer temperature than most *Odontoglots*, except *O. Krameri*. The house in which it is grown should not be allowed to fall below 50° during the winter months. It requires an equal temperature, free from sudden changes, in order to grow it successfully. I have never seen it grow so freely as it does in the rich collection of O. O. Wrigley, Esq., of Bury, under the care of Mr. Thos. Hubberstey. Plants of it are there grown by the dozen, and one fine specimen of it has been exhibited both at Manchester and

in London with sixty delicate flowers, all expanded at the same time. Blooms about May, lasting four or five weeks. It is also sometimes called *Miltonia pulchella*.

O. platycodon (Peruvian Andes).—A strong-growing species, found at high altitudes, where the temperature is subjected to great and sudden changes. Flower-spikes strong, eighteen inches to two feet high, often bearing in their native habitats from fifty to a hundred flowers. This plant is said to be capable of withstanding a degree or two of frost, but we should not advise it to be subjected to such rigorous treatment.

O. pulchellum (Mexico, 1841).—A chaste, white-flowered species, of very easy culture. Bulbs dark green, ovoid, bearing two dark green leaves, very narrow. Flower-spikes erect, from twelve to fourteen inches high, ten or twelve flowered; flowers about an inch across and of crystalline whiteness; lip white, curiously bent or twisted, having a crest shaped like a W, of a clear lemon yellow colour, with a few purple dots. It is a deliciously fragrant species, and very useful for cutting, as its flowers are produced in great profusion. Flowers in March and April, lasting six weeks.

a. O. pulchellum majus.—This is a larger flowered form, similar to the last in habit.

b. O. pulchellum tenuifolium.—Another variety, having very small flowers, not so widely expanded as the last.

O. radiatum—See *O. luteo-purpureum*.

O. Reichenheimi (South America).—A vigorous growing species. Pseudo-bulbs from five to seven inches high, two-leaved; leaves from twelve to fourteen inches long; panicle erect, two to three feet high; sepals and petals green, barred with chestnut brown; lip wedge-shaped, white, with a lilac blotch on its basal half, column very short, white. A free-flowering species, lasting a long time in beauty.

O. roseum (Lindley, Loxa).—This is but little known at present, although one of the oldest and prettiest of the entire group. Messrs. Backhouse and Sons, of York, have been fortunate enough to introduce it within the last few years. Pseudo-bulbs ovoid, two-leaved; leaves ob-lanceolate, about a foot long; spike arched or drooping, from ten to twenty-flowered; flowers about an inch across, and of a uniform deep rosy-crimson colour, the apex of the column only being white. It is very distinct, and should be more cultivated, on account of its colour. Flowers in April, lasting a month.

O. Rossii.—A beautiful Mexican species, of dwarf habit. Pseudo-bulbs angular, rather larger than those of *O. citrosimum*, which it resembles in habit; scapes from one to three-flowered; flowers from one to two inches across; sepals lanceolate, about an inch long, white, barred with brown transversely; petals sub-hastate, much broader than the sepals, pure white, with a few spots at their bases only; lip oblong or cordate, pure white, with a lemon-yellow bilobed crest; column white. A delicate, free-flowering plant, blooming during the winter, and lasting from three to four weeks. It is a native of Mexico.

a. O. Rossii superbum.—This select variety is a better form, having larger flowers than the typical species. Its flowers are from two to three inches across, barred with crimson, very distinct and effective.

b. O. Rossii Warnerianum.—This is another fine form, having pseudo-bulbs two inches high; flowers from three to five, on a scape longer than the leaves, two to three inches across, with broad segments; sepals and petals pure white, barred and blotched with purple at the base; lip cordate, crenate, white, with a golden crest.

**O. Schlieperianum* (New Granada).—In habit this resembles *O. grande*; but it flowers in June and July, lasting a long

time in beauty; flowers as large, and similar in form, to those of the last-named species; but of a pale yellow or amber colour, and nearly destitute of bars or blotches; the lip is golden-yellow, but smaller than that of *O. grande*, of which, doubtless, it is only a variety. It is valuable, however, as it blooms at a totally different season. When well grown, it makes a good plant for exhibition. Some variety exists among different individuals of this species, some being nearly destitute of markings, while others are blotched or barred freely; but in no case so decidedly as is the case with *O. grande* proper. T. A. Titley, Esq., of Gledhow, near Leeds, has a fine darkly-blotched variety of this species, which is also known as *Odontoglossum pretiosum*.

O. stellatum (*O. erosum*).—We have here a pretty little plant, bearing solitary flowers. Pseudo-bulbs two to three inches long, one-leaved, whole plant only six inches high. Flower scapes little more than four inches high; sepals and petals about one inch long, pale yellow, barred with brown; lip white, somewhat concave, and very much jagged round the margin. It flowers freely in June and July, and is a plant worth growing, though not by any means showy. Easily known by its flowers being solitary, and its jagged lip.

O. tripudians.—This has been a long time in continental gardens, though it has rarely flowered; now, however, it appears to be tolerably well distributed in this country. It is a very beautiful plant, having large, glossy flowers; sepals and petals oblong, of a bright chestnut brown colour, their apices being rich, golden yellow; lip fiddle-shaped, white, with purplish violet blotches on its basal portion, and a violet blotch in front of its calli. It has flowered in the collection of E. G. Wrigley, Esq., under the care of Mr. Kemmery.

O. triumphans.—This, if we except *O. grande*, is the most showy of the yellow-flowered *Odontoglossa*. Pseudo-bulbs

something like those of *O. Pescatorei*, but larger, speckled with brown; two-leaved; flower-spikes three to seven-flowered. Flowers four to six inches across; sepals and petals lanceolate, the margins of the petals sometimes slightly jagged, of a bright golden yellow colour, spotted with cinnamon brown; lip white with a lemon yellow centre, the apex tipped with purple rose. This is rather rare, and will make a fine plant when well grown for the spring and early summer exhibitions. I have seen some fine varieties of this glorious species at Ferniehurst.

O. Uro-Skinneri (Guatemala).—This is one of the easiest of all Orchids to grow if properly treated. It affects a cool, moist, and rather shady situation, and must be most liberally supplied with water when growing. Its pseudo-bulbs are thick, and bear broad lanceolate leaves, nine to twelve inches long; flower spikes simple, two to three feet high, bearing ten to twenty flowers an inch and a half across; sepals and petals oblong, green, heavily barred with brown; lip broad, cordate, of a lively rose colour mottled with white, and having a bilobed crest. Blooms about October or November, lasting four to six weeks in flower.

O. vexillarium.—We have here a decidedly novel, and much to be desired species, but one at present rare in collections. Its pseudo-bulbs are linear, two-leaved; leaves, linear ligulate; flower-spike five to seven flowered; sepals and petals about an inch long, pure white, the lateral sepals having a single streak of purple up the centre; lip of enormous size, larger than that of *O. Phalænopsis*, and decidedly flabellate, having a narrow sagittate base; the lip, like the sepals and petals, is pure white, tinged with delicate rose colour, the extreme base being tinged with lemon yellow. The lip is quite two inches in breadth.

O. Wallisii (New Granada).—Pseudo-bulbs ovoid, two-leaved; leaves from nine to twelve inches long, very narrow and Grass-like; spike erect or arching, from five to ten

flowered. Flowers two or three inches across, very showy; sepals and petals oblong, about one inch long, of a golden yellow, blotched with rosy purple; lip straw coloured, with a rosy blotch near the apex; crest, margin, and apex white; lip partially adnate to the column, as in the old *O. epidendroides* (*O. Lindleyanum*), of which very variable species it is not improbably a finely coloured form. It is one of Wallis's introductions to the establishment of M. Linden.

O. zebrinum.—This is a curious plant, having the habit of *Oncidium macranthum*. Flower-stems from five to six feet long, flexuose, and branched in the same manner as those of the last-named species. Its flowers are of moderate size, one to one and a half inch across; sepals and petals equal, white, very much crisped or wavy, and barred with brown, the white lip having a large corrugated golden crest, quite unlike any other *Odontoglot* or *Oncid* I have seen. Flowers in August and September, lasting a considerable time. This plant also goes under the name of *Oncidium zebrinum*.

Oncidium.

This genus, if we except the *Epidendrums*, is perhaps the most numerous in species, and many of them are more or less adapted for growing in the cool Orchid house. Amongst the latter must be enumerated the truly noble *O. macranthum*, one of the finest of all Orchids, *O. serratum*, *O. crispum*, *O. cucullatum*, *O. Phalænopsis*, *O. nubigenum*, and *O. splendidum*, not to mention others equally beautiful. Most of the *Oncids* are remarkable for producing a profusion of golden yellow flowers more or less blotched with brown, and they are for the most part of easy culture. The larger growing species will succeed in the compost recommended for *Odontoglots*, and should be grown in pots. The smaller kinds, as *O. cucullatum* and its varieties, may either be grown in shallow

pans or on flat blocks suspended near the light. One or two species are well worth growing for cut flowers, as the old *O. flexuosum* and *O. obrysatum*. *O. cucullatum*, or at least one form of it, is found at from 12,000 to 14,000 feet elevation, and from this extreme altitude we find them on the mountain ranges lower and lower until we come through the temperate zone, and find some species luxuriating only in the hot tropical valleys and lowlands. Still we have sufficient cool species to furnish us with cut flowers all the year round.

O. æmulum (New Granada).—Inhabits the highlands at a great elevation, and is a vigorous-growing cool species. It is a worthy rival to the splendid *O. macranthum*, and, like that species, bears very large flowers. The dorsal sepal is nearly reniform in shape, and of a warm cinnamon colour; the lateral sepals are longer, and of a yellowish-brown or cinnamon colour; the petals are very bright cinnamon, all the segments being nicely crisped or wavy; the lip is marked with purple violet, and is yellow at its base, with reddish-brown streaks.

O. andigenum.—This is a choice kind belonging to the *O. cucullatum* type, having yellow flowers densely covered with small purple dots; the column is purple, and the crest of the lip of a deep golden yellow; flower-spike erect, from five to seven-flowered. The plant in habit somewhat resembles the typical species just quoted. It is a native of New Granada, Ecuador.

O. amictum.—See *O. sarcodes*.

O. aurosum.—This is another species, producing an abundant supply of golden flowers on an erect spike, branched at the top or near its apex only; flowers individually about one to one and a half inch across, golden yellow, spotted with warm brown. Flowers in autumn, lasting from three to five weeks.

O. barbatum.—A very free-flowering species, the pseudo-

bulbs being roundish ovoid, with a well-defined ridge up the centre, like those of *Lælia acuminata*; one-leaved; spikes from one to three feet long; flowers from one and a half to two inches across, it being very variable in size as well as in colour; sepals lanceolate, with wavy margins of a pale yellow colour, barred with warm chestnut brown; lateral sepals connate for half their length; petals oblong, with wavy margins of a clear golden colour, streaked with crimson brown at the base only; lip triangular; lateral lobes clear golden yellow, margin of the discal portion fimbriate and spotted with brown; apical lobe rhombiform, clear yellow. This is a very variable species, one or two of its varieties being equal to *O. bifolium* in colour, and much more easily grown. Some varieties have their petals lanceolate, and barred with brown, like the sepals. Flowers in June, July, and August, and blooms very freely in a cool temperature.

**O. bifolium*.—This is one of the best and most compact species we have. Its pseudo-bulbs are one inch long, often fluted, and spotted with brown; two-leaved; leaves from three to six inches long, dark green; panicles drooping, many flowered; sepals and petals half an inch long, pale yellow, or green barred with brown; lip from one to one and a half inch across, of the brightest golden yellow colour. This, together with the still better form known as *O. bifolium majus*, should be grown in a shallow, well-drained pan, in peat and living sphagnum, suspended close under the glass.

O. crispum (Organ Mountains, Brazil).—A free-flowering species, having brownish fluted pseudo-bulbs, from one to two inches high, two-leaved; leaves oblong, often tinged with bronze; flowers from twenty to thirty, on an erect spike, and two to three inches across; the sepals and petals are of a bronzy red or warm brown colour, very unique. Flowers in winter, lasting four or five weeks.

a. *O. crispum Forbesii* is a brighter coloured variety of this good old species.

O. cucullatum (New Granada—altitude from 8,000 to 9,000 feet).—A dwarf-growing species, growing well either on a block or in a pot suspended close under the roof, exposed to the light; flowers from seven to ten, on spikes a foot long; sepals and petals rose colour, spotted with purple; lip white or rosy purple, spotted with much darker purple. It flowers freely, and lasts from four to five weeks in beauty.

O. flexuosum (Brazil, 1818).—An old, free-blooming species, well known as being of easy culture. Pseudo-bulbs, borne at short intervals, on a creeping stem; flat, and two-leaved; spikes from three to four feet high, branched, and bearing a profusion of small flowers, having a golden yellow lip. It is well adapted for cut flowers. Lasts from three to four weeks.

O. leucochilum (Mexico and Guatemala, 1835).—A free-growing species, often erroneously called *Odontoglossum læve*; bulbs two-leaved, large, of a glaucous colour, and fluted; flower-stems from five to fifteen feet in length, branched; flowers an inch across; sepals and petals green, barred more or less with brown; lip white, changing to yellow when old, and having a band of purple across its disc. Blooms in the winter, lasting quite six weeks.

O. macranthum (Peru and New Granada).—A large-growing *Oncid*, well adapted for the cool house. Pseudo-bulbs from five to seven inches long, two-leaved; leaves lanceolate, bright green, with yellow lines; flower-spikes from nine to fifteen feet long, flexuose, and branched, branches bearing from five to fifteen large flowers each; sepals unguiculate, about an inch long, of a warm brown colour; petals broader and of a clear, golden yellow colour; lip dagger shaped, of a bright purple colour, having a fleshy white crest. Its glorious flowers are three inches across. When well grown, it is difficult to find

a more noble looking plant, the blossoms being of good substance and lasting a long time. Flowers in July and August.

O. Marshallianum (South America).—A really beautiful plant, of which fine specimens have been shown. It is best considered as a golden-blossomed variety of *O. crispum*. In habit it is identical with the last-named species; but its pseudo-bulbs and leaves are pale green instead of reddish brown or bronze-coloured. The flowers are from two to three inches across, of a rich golden-yellow colour, marked with brown spots and blotches. It grows well either in a pot or a pan suspended near the light, and, like its congeners, *O. crispum* and *O. crispum Forbesii*, does well in peat and sphagnum in the coolest end of the house.

O. obryzatum (New Granada).—This species is as easily grown as the old *flexuosum*, and freely produces an abundant supply of long-branched spikes, heavily laden with fragrant blossoms of brown and gold; flowers in good varieties an inch across; blooms throughout the dullest winter months, lasting a month in flower, and, moreover, is well adapted for cutting. It is one of the most valuable of winter-flowering Orchids.

O. ornithorhynchum (Mexico, 1826).—Pseudo-bulbs glaucous from one to two inches high; two-leaved—leaves oblong; flower-spikes freely produced during autumn and winter, very much branched, and heavily laden, like the last, with fragrant blossoms of a lilac or purple colour, with a golden corrugated crest on the lip. This and its larger form are well adapted for indoor decorative purposes, being, when well grown, one dense mass of flowers.

O. Phalænopsis (Peru).—This plant in habit resembles *O. cucullatum*, but bears more showy flowers; sepals white speckled with purple; petals white, with bright purple bars

lip fiddle-shaped, pure white blotched with purple, like the petals, and having a bright lemon-yellow crest. It is a most beautiful and free-flowering plant, lasting from four to five weeks in beauty. Grows well in peat, or on a block, with living sphagnum, in the cool end of the house.

**O. sarcodes* (Peru).—A plant having narrow bulbs, from five to seven inches high, bearing two oblong leaves of the darkest green; flower-spike from two to five feet long, bearing from sixty to seventy golden-yellow flowers from one to one and a half inch across, heavily blotched with crimson brown. It is one of the most distinct and beautiful Oncids in cultivation, lasting a long time in flower. In habit it is identical with the dingy-flowered *O. pubes*—a species scarcely worth a place in collections.

O. serratum (Peru).—This species slightly resembles the grand *O. macranthum* in habit, its ovoid pseudo-bulbs bearing two ensiform leaves from one to two feet long; flower spike from five to twelve feet long, branched and flexuose like that of *O. macranthum*; flowers from two to three inches across, of a deep brown colour, very peculiar, on account of the crested apices of the petals being connate, forming an arch over the small lip and the column. Grows and flowers well in the cool house, treated like *O. macranthum*.

**O. splendidum* (Guatemala).—A robust species, having the habit of *O. microchilum*, but bearing flowers superior to it in size and beauty. Bulbs an inch high, bearing a solitary oblong leaf, from four to seven inches long, and of great substance; flower-spike erect; flowers two inches across; sepals and petals green, heavily barred with brown; lip of a rich and bright golden yellow colour. It is one of the finest species in cultivation.

**O. tigrinum* (Mexico).—Also known in many collections as *O. Barkeri*. It is a very beautiful and showy species; sepals

and petals rich brown, heavily barred with yellow; lip from one inch to an inch and a half across, of a very bright golden yellow colour. Flowers during autumn and winter, lasting six weeks in beauty. This species has borne fifty flowers on a fine branched spike, in Dr. Ainsworth's collection. The large flowers of this species closely resemble those of the last-named, but the plants are widely different in habit. *O. splendidum* has smooth, dark green bulbs, bearing a rigid solitary leaf, while *O. (Barkeri) tigrinum* has stout, angular, two to four-leaved bulbs, similar in form to those of *Odontoglossum grande*.

Palumbina.

**P. candida*.—A pretty and distinct plant, related to the Oncids. It is very rare in our collections. Its flowers are of the purest white, of a stout, waxy consistence, and last a long time in beauty. A native of Guatemala; it thrives well under cool treatment, in a small pot, with fibrous peat and fresh sphagnum. It must be carefully drained, as stagnant moisture is sudden death to it at any time.

Pescatorea.

P. cerina (Veragua).—A charming Orchid, growing at an altitude of 8,000 feet, on the volcano of Cherique. Leaves a foot long, distichous; flower scapes stout, each bearing a waxy blossom, from two to three inches across; sepals and petals pure white or creamy yellow; lip of a lemon yellow or straw colour, having a semi-circular, plaited crest, streaked with red; column purple. It is a chaste and beautiful plant, flowering in April and May, lasting a considerable time. This plant is also known under the generic names of *Zygopetalum* and *Huntleya*.

Phajus.

P. grandifolius.—The plants of this small genus are ever-

green, and soon form noble specimens, producing an abundant supply of flowers in winter and spring. A noble plant of this species bore thirty-six fine spikes at Chatsworth, in 1871. It is a native of Hong Kong, growing in moist localities. Leaves from two to three feet long, broadly lanceolate; flower-scapes from two to four feet high, many flowered; flowers from three to four inches across; sepals and petals lanceolate, of a brownish colour within, white without; lip convolute, white, with a dark crimson-brown throat. The spikes of this free-flowering species are well adapted for cutting. January to March, lasting six weeks.

P. Wallichii (India).—Khasya hills in sheltered positions. A vigorous growing plant, similar in habit to the last, bearing tall spikes, from three to five feet high. Flowers from four to five inches across, of a warm brown colour; lip yellow, with a brown throat. Lasts six weeks in beauty, blooming a month later than the last.

Pilumna.

**P. fragrans*.—This is a very beautiful white-flowered Orchid, nearly related to the *Trichopilias*. Its pseudo-bulbs are flat, from four to seven inches high, bearing a dark green leaf. Flowers from two to four on a stout spike; sepals and petals pure white; lip also of snowy whiteness, having a spot of bright orange on its disc. The plant figured in the *Botanical Magazine* under this name is not nearly so good as this plant, and is in all probability another green sepaled species. Messrs. Backhouse & Sons, of York, have been successful in obtaining a good importation of this deliciously perfumed plant, which will soon become a favourite in our collections. It grows freely treated like the *Trichopilias* with a good supply of moisture when growing.

Pleione.

This is a pretty little genus of elegant plants from the

mountain uplands of northern India, where they are found either as sub-terrestrial plants, growing on Moss-covered rocks, or else as epiphytes on the stems of Moss-grown trees in shady localities. Of all alpine plants none can possibly be more chastely beautiful than these lovely "Indian Crocuses," as they are sometimes called. In cultivation it will be found best to grow these plants in shallow well-drained pans, using a compost of fibrous peat and living sphagnum, with the addition of a little leaf-mould and sand. When growing they should be shaded and freely watered, but as their leaves begin to fade they should be more fully exposed to the sun, in order to thoroughly ripen their stout corrugated pseudo-bulbs. This will induce them to bloom freely, and then nothing can possibly be more lovely than these cool exotics. I have had the pleasure of seeing great pans of these little alpine gems bearing from twenty to eighty flowers in the Ferniehurst collection. Some cultivators grow these plants well in leaf-mould, sand, and living sphagnum, but in all cases shade and moisture are essential to their vigorous growth, and they should be potted soon after they have flowered.

P. humilis (Upper Nepaul).—Altitude from 7,000 to 8,000 feet; a delicate little species. Flowers white; lip with yellow and rose-coloured veins, having about six pectinate ridges on the disc, the margin being serrulate. This species is easily recognised from the others by its dark green or purplish flask-shaped bulbs being smooth, not corrugated, as in the other species. This delicate little plant produces bulbils on the apices of declining bulbs; these fall off and rooting into the sphagnum soon become flowering plants. Pans of this, when well grown, bear from twenty to thirty flowers, all expanded at the same time. It is of easy culture, and lasts from two to three weeks in beauty.

P. lagenaria (India).—Something like its congener, *P.*

maculata, from which it may be distinguished by its rosy lilac or mauve sepals and petals. Flowers two to three inches across; lip white, veined and streaked with crimson, having a yellow blotch in the throat. It is a beautiful species, and lasts a long time if kept free from drip. A single pan of this plant, grown by Mr. Petch at Manley Hall, bore eighty flowers in October 1872.

P. maculata (Khasya Hills).—This has pale green inflated bracts, by which it may be readily distinguished when growing. Its sepals and petals are pure white; lip white and yellow, and, like the last, heavily streaked with crimson purple.

P. Reichenbachiana.—Another lovely little Alpine species, of recent introduction, bearing large flowers, two on a spike. Sepals and petals rosy lilac; lip delicately tinged with purple, and beautifully fringed with crimson in front. It is from Rangoon, and has flowered with Mr. Beesley, gardener to the late P. Callander, Esq., Whalley Range, Manchester.

P. Wallichiana (India).—This is considered to be a variety of *P. præcox*, and flowers freely about November. Its large solitary blossoms are of a bright rose colour; lip lilac, with a white centre. It lasts a fortnight in beauty. Like all the rest of its congeners it has pectinate ridges up the centre of the disc.

Polystachya.

A large genus of Cape terrestrial Orchids, not very pretty, and consequently not much cultivated. The present species is, however, an exception, and grows well in the cool house.

P. pubescens (Algoa Bay).—Although introduced a long time ago, this beautiful little plant still continues rare. Its pseudo-bulbs are from two to four inches high, tapering from the base to the apex, where they bear three or four dark green leaves, often tinged or streaked with red, like the bulbs. Spike terminal, erect, three to five flowered; sepals and petals

yellow, the lateral sepals having each four red lines; lip trilobed, with a hairy centre or disc. Grows well in peat and sphagnum, and produces its golden blossoms very freely, lasting from four to six weeks in bloom. It is also called *Epiphora pubescens*.

Restrepia.

A genus of small growing plants, very nearly related to the Pleurothallids, and scarcely more showy. They grow well in a very cool temperature, potted in peat and sphagnum, and require to be kept moist all the year round.

**R. antennifera* (Columbia).—A curious species. Its slender stems are about two inches high, each bearing a solitary ovate leaf, from the base of which the flower-spike is produced. Sepals long, of a yellowish white and rosy crimson colour, heavily spotted and dotted with purple, the lower sepals being darkest; petals slender, pale yellow dotted with purple, and, like the sepals, having curiously blunt rounded apices. It flowers freely through the whole summer months, and should be grown by all who are fond of vegetable curiosities.

R. elegans (Columbia).—This is a smaller-flowered form, very similar to the last in colour, and equally curious in its structure. Flowers freely in a cool house.

Sobralia.

This genus is quite distinct in habit from most other classes of Orchids. The growth resembles that of Reeds, often reaching from five to seven feet in height, and is clothed with dark-green ovate-lanceolate leaves. The flowers are produced from the apex of these tall, slender stems, and are large, handsome blooms, of a white, lilac, rosy-purple, or rich crimson colour, according to the species; and, when the plants are well grown, they are produced in abundance. Sobralias grow well in the warm end of the cool house, in a rough compost of

fibrous peat, crocks, and sphagnum. They require large supplies of water when making their growth. One of the largest plants I have seen is in the collection of John Rhodes, Esq., Potter Newton House, Leeds. It grows in the corner of a warm fernery, and flowers magnificently, being a tall-growing, but superb variety of *S. macrantha*.

S. macrantha (Guatemala).—One of the very finest Orchids we have when well grown. Its varieties vary in height from two to seven feet, but all bear finely-coloured blossoms; flowers borne singly at the top of long stems, individually from five to six inches across; sepals and petals rosy purple; lip beautifully suffused with rich crimson purple and yellow. Makes a fine plant for exhibiting when vigorously grown. Unfortunately, the flowers are not very lasting—from three to four days; but, on healthy plants they are produced in rapid succession. Flowers in March and April.

a. S. macrantha splendens (Guatemala).—This has rather smaller flowers than the last, but they are of a richer colour. The plant, or at least some of its sub-varieties, are much dwarfer than the species, being only from one and a half to two feet in height.

S. Ruckeri (New Granada).—A very rare species, but seldom met with in collections. It grows from two to three feet high, bearing from three to four fine large flowers on a short spike; sepals and petals mauve, or rosy purple; lip white and crimson. This also remains in flower longer than any of the other species.

Sophronitis.

Of this small genus we have three or four introduced species, all interesting and very beautiful. They are small, dense-growing epiphytes, and do best on flat blocks, with living sphagnum Moss. Their fine bright scarlet flowers are produced in the depth of winter, and are very showy. They

grow remarkably well in the warm end of the Peruvian house. They must be copiously supplied with moisture when growing.

S. cernua (Rio, Brazil).—Pseudo-bulbs short and thick, bearing an oblong fleshy leaf, scarcely an inch long; flowers bright reddish scarlet, produced on drooping spikes, from three to nine together. Flowers in the winter, lasting from four to six weeks in beauty.

S. coccinea (Brazil).—Pseudo-bulbs short, one-leaved; leaves oblong, from two to three inches long; flowers large, from two to three inches across, and of good substance: sepals and petals of the brightest scarlet; lip yellow, barred or streaked with red. This does well either on a block with sphagnum Moss, or planted in peat and sphagnum in a shallow pan, and suspended near the roof. Flowers in winter.

S. grandiflora (Organ Mountains, Brazil).—This and the last are the two best in the group, and should be grown by the dozen for winter bloom. The pseudo-bulbs are from one to three inches long, one and two-leaved; leaves from one to three inches long. Flowers large, brilliant scarlet, produced freely about December. There are one or two varieties of this little plant, some having shorter bulbs and smaller, deeper coloured flowers than the others. The effect produced by a small plant of this species, even with only four expanded flowers, is wonderful when seen in company with fresh green leaves and white flowers, as those of *Odontoglossum Alexandræ*. This plant, when in flower, may be taken to the drawing-room, and will last for weeks unharmed if covered with a clean glass shade or bell-glass. I have seen this grown and flowered well in a Wardian case for several successive years in an ordinary sitting-room.

S. violacea.—This is another pretty and very distinctly coloured species from the Organ mountains. Its pseudo-

bulbs are slender, spindle-shaped, from two to three inches long, bearing a narrow lanceolate leaf about the same length. Its flowers differ from those of its congeners in being of a rosy lilac or deep violet colour, not scarlet, as in all the preceding.

Tricocentrum.

This genus consists for the most part of small flowered inconspicuous plants.

**T. albo purpureum*.—This is, however, well worth growing, and produces its flowers freely. It has no pseudo-bulbs, but dark green fleshy leaves, lanceolate in form, and from four to six inches long. Flowers on drooping scapes; sepals cinnamon brown; lip white with a pair of purple lilac blotches near its base. It comes from New Granada, and grows well, blooming freely under cool treatment.

**T. tigrinum*.—Somewhat resembles the preceding in habit, but has much larger and finer flowers. Individual blooms from two to four inches across; sepals and petals greenish-yellow, barred with brown; lip white at the apex, the basal portion being bright orange-yellow. This is a beautiful and very rare species.

Trichopilia.

This is a beautiful genus of easily grown and profuse blooming plants. They grow freely in the warm end of the cool house under what is known as Mexican treatment, that is, cool but drier than the Peruvian house, which is kept very cool and moist. They should be planted in good fibrous peat well elevated above the rim of the pans or pots, then if the latter are well drained there can be little fear of their ever receiving too much water. There are many species in cultivation, but we shall only notice the best and most useful.

**T. coccinea* (Central America).—Bulbs from two to four inches long, one-leaved. Flowers from two to four inches across; sepals and petals ligulate, creamy-white, mottled with

red or brown; lip deep crimson with a white margin. Blooms freely about June, bearing from one to two flowers on a spike, and lasts from two to three weeks.

**T. crispa*.—This is decidedly one of the best in the genus, and a very free-flowering species. Flower spikes from two to three flowered. Flowers from two to four inches across; sepals and petals white mottled in the centre with reddish-crimson blotches; lip deep crimson sometimes slightly edged with white. A plant of this in the collection of Charles Stead, Esq., Baildon, near Leeds, bore three crops of flowers annually, and has had more than one hundred flowers expanded at the same time.

**a. T. crispa marginata*.—This is a variety of the preceding species, from which it differs in having much darker coloured flowers, and a very distinct pure white margin to its deep crimson lip. It is very rare, and very beautiful when well grown.

**T. suavis*.—We have here an easily grown winter and spring flowering Orchid of rare beauty. Pseudo-bulbs flat glaucous, one leaved; leaves oblong and slightly glaucous. Flowers from January to March, bearing three large blooms on a drooping spike; sepals and petals pure white, spotted with bright rose; lip also white, blotched with rosy pink. It flowers very freely, lasting a fortnight in beauty.

**a. T. suavis grandiflora*.—This is a selected garden variety with more richly coloured flowers than those of the normal form.

**T. tortilis*.—Bulbs slender, one-leaved; leaves oblong-lanceolate. Flowers solitary or two together on a drooping spike; sepals and petals pale yellow, blotched with brown very much twisted; lip pure white, heavily spotted with red. This is a variable plant, some of its varieties bearing handsome and brightly coloured flowers. Blooms in June and July, lasting two or three weeks in perfection.

Uropedium.

U. Lindenii.—This is the only species we have in this genus, and it might correctly be referred to as a monstrous variety of *Cypripedium caudatum*, from which it differs in having no pouched lip, but a long petaloid segment in its place. In habit it is exactly identical with the last-named plant, having dark green foliage from nine to twelve inches in length. Flowers large, two or three on a stout scape; sepals with wavy margins, of a greenish yellow colour, veined and netted with dark green; petals one to two feet long when fully developed, of a reddish-brown colour, and hairy. It is far more curious than beautiful, and grows freely in the warm end of the cool house, along with the *Cypripediums*. It does best in a pot, using a compost of fibrous loam, peat, and crocks, covering the whole with a layer of living sphagnum, into which both this plant and also the *Cypripediums* delight to root freely. It lasts a month in flower, and must be freely supplied with moisture, both at the root and in the atmosphere, all the year round. If allowed to shrivel, through aridity in the atmosphere or want of water at the roots, it will take a long time to recover itself.

Vanda.

This superb genus contains many lovely and rare species, but there are only two we can claim as being suitable for cool treatment. They are mostly natives of India, and are amongst the most beautiful of exotics.

**V. cœrulea* (Assam).—This is a stiff-growing species, which grows freely in fibrous peat, living sphagnum, and crocks. It does best in a basket suspended close to the light. It flowers during the dullest period of the year, bearing many-flowered spikes of pale mauve or light blue flowers, from ten to twenty, or even more in rare instances, on a spike. It is one of the best of the *Vandas*, and is now becoming very cheap. It is

very much inclined to become spotted with yellow on its leaves; for which the best remedy is to grow it exposed to the light, and free from cold draughts. The temperature should be maintained as equal as possible, free from sudden transitions, and then it seldom spots. It lasts from four to six weeks in perfection. There used to be a noble specimen of it at Dalkeith, and another at Grimston Park, in Lord Londesborough's collection. The former plant has borne twenty-eight flowers on a single spike.

**V. teres*.—This is easily distinguished from its congeners by its quill-like foliage and stems. Its large rosy-purple and yellow flowers are freely produced on well grown plants from June to August, and last from four to five weeks in perfection. This is sometimes considered a shy-flowering species, but if grown in a cool airy house, and fully exposed to the sun when it is thoroughly well established, it will flower freely enough. It does well in fibrous peat, sphagnum, and crocks in a pot, and I have seen good plants of it trained on teak rafts. It is a native of Sylhet, and makes a noble exhibition plant when well grown.

**a. V. teres Andersoni*.—This is a fine variety of the normal type, and by some is considered to flower more freely.

Zygopetalum.

This is a genus containing one or two well known winter-flowering Orchids of great merit. There are about a dozen species introduced, and all of them grow well in the cool house with plenty of air and moisture when making their growth. They are nearly related to the Huntleyas, Warreas, and Pescatoreas. *Z. maxillare* and *Z. Mackayi* are two of the best species in the genus.

Z. aromaticum (Central America).—This is a rare and beautiful species, bearing flowers four inches across. Sepals and petals of a soft pea-green colour; lip large and nearly cordate,



Vincent Brooks Day & Son, Imp.

1. *Zygopetalum maxillare*
2. *Masdevallia Harryana*
3. " *ignea*
4. *Odontoglossum Pescatorci*



purple in the centre, with a pure white margin; strongly perfumed; grows well in a pot in fibrous peat and living sphagnum moss.

Z. brachypetalum.—A very handsome Brazilian species, having brown sepals and petals marked with green, and a deep violet-coloured lip, streaked with white. It flowers in December, lasting from three to four weeks in beauty. It is a very beautiful and easily-grown plant.

Z. crinitum (Brazil).—A strong-growing plant, which commences to grow about November, producing stout, erect spikes, bearing from five to seven large flowers. Sepals and petals pale green, barred with brown; lip white, with slightly divergent hairy lines, of a decided purplish blue colour.

**Z. Gautierii* (St. Catharine, Brazil).—This striking species somewhat resembles *Z. maxillare* in habit, but has much larger flowers. Flowers on an erect spike; sepals and petals bright green, heavily blotched with brown; lip very broad, cordate, or nearly reniform, pure white, the crest being stained with very rich violet purple. Nearly all the species of this genus have green and brown sepals and petals, the white ground colour of the lip being marked with purple.

Z. gramineum.—This is a rare plant, which is only to be found, I believe, in the collection of Lord Egerton, at Tatton Park. It has narrow, grass-like foliage, and short spikes, bearing three or four white and purple flowers.

Z. Mackayi.—A handsome and well-known plant, bearing numerous long spikes of flowers during the dull winter months. Sepals and petals greenish yellow, heavily blotched with dark brown; lip white, streaked and blotched with violet purple. It lasts in beauty from four to six weeks, and grows best in a pot in a compost of peat, charcoal, sphagnum, and crocks. Requires watering freely when making its growth during the spring and summer months. There are several

varieties of this old plant, which vary slightly in the size and colour of their flowers.

Z. maxillare.—This is another free blooming species, which produces its flowers in the autumn, and lasts a long time in beauty. Its bulbs are much smaller than the last, and the leaves are shorter and narrower. Sepals and petals green, marked with brown transverse bars and blotches; lip white, with a richly purple-stained base; well-grown plants bear from 50 to 100 flowers at a time. This fine *Zycopatalum* will grow in peat and sphagnum in a pot, or succeed well on a block; in either case it requires to be well watered when growing. Edwin Wrigley, Esq., of Bury, Lancashire, has in his collection a remarkably fine plant of this species. In 1870 it had but seven bulbs when obtained, from which it made four fine healthy growths. In 1871, it made nine strong breaks, and in 1872 it made seventeen vigorous breaks, which collectively have borne 147 flowers!

Hardy, or Half-hardy Lady's Slippers.

Originally it was not our intention to have alluded to hardy herbaceous Orchids, but as the present genus is exceptionally curious, and some of its species very beautiful, we may be pardoned for slightly deviating from our premeditated design. In Messrs. Backhouse's nursery, at York, two species at least of these lovely plants flourish luxuriantly in the sheltered recesses of their admirable rock garden. *Cypripedium Calceolus* is there planted in loam and limestone with an eastern aspect, sheltered from the western gales by a broad mass of sandstone rock. Here I counted upwards of thirty fully expanded flowers during one of my visits, all open at the same time. Its still more beautiful congener, *C. spectabile*, grows luxuriantly in peat and sand, and flowers freely. When grown in pots, the pots should be plunged in spent tan or ashes, and

the surface of the pots covered with fresh living sphagnum ; this not only preserves an equable state of moisture at the root, but also gives a neat and clean appearance to the plants. Speaking of sphagnum, I would here observe that no Orchid pot should be allowed to go without a layer of living sphagnum moss over the peat or other compost it contains. There are but few Orchids that will not root freely into living sphagnum, and it is quite exceptional to meet with unhealthy, shrivelled plants where sphagnum is freely used as a top-dressing. For all cool Orchids, more especially, it is a *sine qua non*. It is a mistake to keep hardy or half-hardy Cypripediums as dry as dust when at rest. In their native habitats they obtain an abundant supply of moisture at that particular season, and in cultivation the compost in which they are grown should be kept moderately moist. The worst treatment these plants can receive is to allow them to become dust dry, and then to deluge them with water. That hardy Orchids can be grown well has been demonstrated beyond a doubt by Mr. Needle, gardener to H.R.H. Comte de Paris, at Twickenham, and we hope to hear of others taking up the culture of the many lovely species that come to us from N. America, the Cape of Good Hope, and the south of Europe. In their native habitats, most of the hardy Orchids are found growing in close contiguity to damp Moss, Grasses, or Sedges, often in spongy morasses, bogs, or other sub-aquatic situations ; still it is exceedingly rare to find any attempt being made to grow them in similar positions here at home. Plant them out in a position shaded from the blazing noon-day sun, amongst Moss and herbage, the close contiguity of which assists their growth by preventing undue evaporation, not only from the soil in which they may be planted but also from the plants themselves. We here append a list, and Lindley's synopsis of all the species of hardy Lady's Slippers with which we

are acquainted, many of which rival in beauty their tropical congeners. When our rock and bog gardens come to be more fully appreciated, we may hope to see these plants blooming in healthy vigour, lighting up moist shady nooks and corners in our gardens, along with *Pinguiculas*, *Sundews*, and no doubt the Californian Pitcher Plant (*Darlingtonia californica*), *Sarracenia purpurea*; and perhaps *Dionæa muscipula* will bear them company in the southern counties.

Hardy *Cypripediums*.

C. Calceolus (Europe).—This species is occasionally found in the north of England, and is one of the rarest of our native wildings, bearing solitary flowers. Sepals and petals purplish, veined; lip pure yellow outside, within marked with deep, orange-scarlet, hairy lines.

C. parviflorum (America).—Stems one and two-flowered; sepals purple, with darker veins, petals linear, twisted like a fanciful corkscrew; lip yellow, concave or depressed in front. The flowers of this species are smaller and darker coloured than those of the next species, which it otherwise somewhat resembles.

C. pubescens (North America).—Flowers generally solitary; sepals and petals yellow, streaked with red, the latter linear and twisted; lip pure yellow, convex in front.

C. guttatum (Northern Russia, Siberia, and North America).—A rare and lovely little plant; stem a few inches high, two-leaved; flowers solitary, of pearly whiteness, spotted and blotched with purple.

C. macranthum (Siberia).—Flowers rose-coloured, with deeper coloured veins; lip globose, inflated, with deeper coloured reticulations.

C. ventricosum (Siberia).—This very much resembles the last-named species, but the petals are narrower and longer than the lip, and the whole flower is of a much deeper rosy purple.

C. spectabile (North American Woods), syn. *C. album*, *C. reginæ*, *C. hirsutum*, and *C. canadense*.—One of the most chastely beautiful of the whole family, even rivalling *C. niveum* of the tropical section in delicacy of colouring. Sepals and petals pure white; lip white, suffused with bright rose; flowers solitary, or in pairs.

C. acaule (North America), syn. *C. humile*.—Not caulescent. All the others here named are furnished with leafy flower-stems. Leaves two, radical, from the centre of which the flower-stem rises, bearing a solitary flower, with a large, inflated, rosy-purple lip, depressed in front.

C. arietinum.—Stem bearing from three to four lanceolate leaves, and terminated by a small flower, having narrow sepals and petals; lip tapering to a blunt point, woolly on its superior part, of a white colour, chequered with rose.

C. Irapeanum (Pelican Flower).—Flowers similar to those of *C. spectabile* in form, but larger, and of a bright, clear, golden yellow colour. The lip is rather deeper coloured than the other segments, and is spotted inside with bright red, forcibly reminding one, in form and markings, of a large-flowered herbaceous *Calceolaria*.

C. montanum (N. America).—Stems two or three-flowered; sepals acuminate, two and a half inches long; lip white, of the size and form of that of *C. spectabile*; the longer segments, however, may serve to distinguish it.

C. passerianum (N. America, syn. *C. parviflorum* of Richardson).—Lindley describes this species as being nearer in affinity to *C. spectabile* than any other North American plant, but its flowers are many times smaller, and, in addition, the front sepal is bidentate.

C. cordigerum (N. India).—Of this Lindley speaks as follows:—"If this species had not white flowers, with pale green sepals and petals, I should have no doubt of its being a mere

variety of *C. Calceolus*, from which I can distinguish it by no satisfactory [structural] character. I think, when further examined, it will be found to merge into *Calceolus*, which has already been found in Dahuria, and which, if Thunberg's *C. Calceolus* is rightly named, must extend into Japan."

C. candidum (N. America).—This species has been recently figured in the "Botanical Magazine," t. 5,855, and is a small, white-flowered kind not so beautiful as some of its congeners, but worth adding to a general collection.

C. palmifolium.—This curious tall-growing species I have not seen. Its stems grow several feet in height, and its leaves in texture resemble those of a *Sobralia* or Palm, as its specific name indicates. We believe this species was introduced to Kew years ago, but is probably not now in cultivation, a remark which will apply to several of the above-named species.

Cypripedium.

FLOWER-STEMS MANY LEAVED.

Lateral Sepals always connate.

C. parviflorum, *C. pubescens*, *C. candidum*, *C. spectabile*,
C. molle, *C. palmifolium*.

Lateral Sepals free at their apices.

C. Calceolus, *C. cordigerum*, *C. montanum*, *C. passerianum*,
C. Trapeanum, *C. macranthum*, *C. ventricosum*.

Sepals entirely free.

C. arietinum.

FLOWER-STEMS TWO-LEAVED.

C. guttatum.

STEMLESS SPECIES.

Leaves all radical.

C. (acaule) humile.

COOL AND INTERMEDIATE ORCHIDS.

INDEX AND ALPHABETICAL LIST.

THE following alphabetical list contains many species not mentioned in the "Select Descriptive List," and will be found handy for reference as to nomenclature, the various synonyms being added. It is but fair to state that in the compilation of this list, I have derived much assistance from the well-arranged catalogue of Messrs. Rollisson & Sons, an old established Orchid-growing firm that has done much towards extending a love for these beautiful plants.

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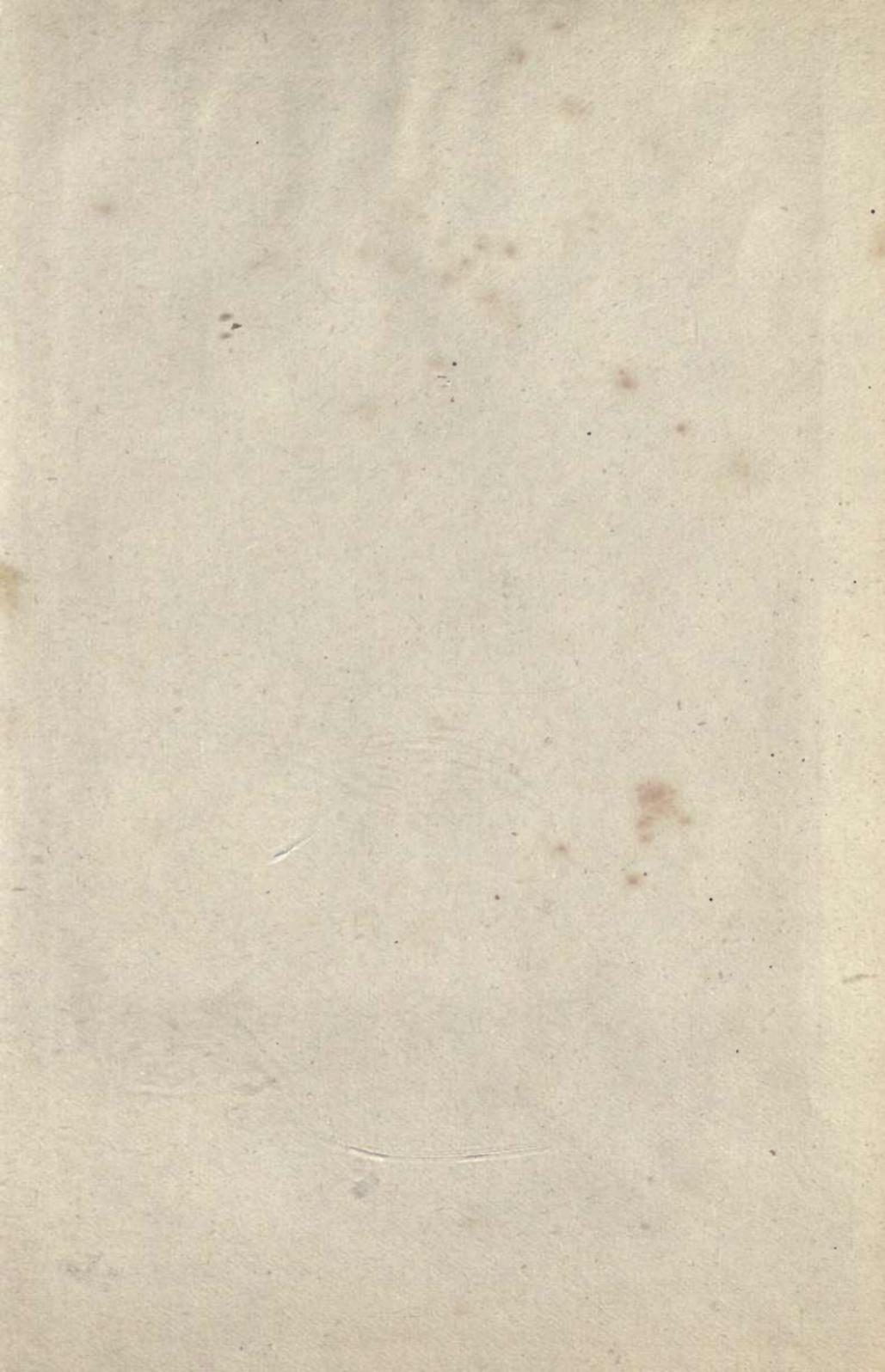
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THE END.



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