Orchids

Charlesworth & Co. 1922.

FOREWORD.

Haywards Heath,

Sussex.

In asking your acceptance of this Catalogue, we venture to thank you and our numerous patrons for their valued support, and to solicit recommendations to all interested in Orchid culture.

The absence of a Catalogue since 1914 needs no further comment than that it was directly due to the War.

Our Establishment is now in normal working order, and we can assure our clients of our ready assistance as in the past in all matters relating to Orchidology.

All plants in this list are guaranteed true to name, but should clients upon receipt of plants be in any way dissatisfied with them, they may be returned to us. Should any plant not flower within a reasonable degree of the description or of a painting of such flower, the purchase money will be refunded if desired with 5 per cent. added interest, and no further claim admitted.

In 1920 our Firm suffered a great loss in the death of its Founder and Chief, Mr. Joseph Charlesworth. We are continuing the work of Orchid raising on the scientific lines which he followed and can claim to be the only commercial Firm raising seedlings by what is termed the " Pure Culture Method." As an innovation we present an article on the theoretical questions concerning the relation of Fungi and Orchids, by Captain J. Ramsbottom, O.B.E., M.A., of the British Museum (Natural History), who collaborated with Mr. Charlesworth in his scientific researches.

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ORCHID MYCORRHIZA

By J. Ramsbottom.

Introduction.

One of the most interesting phenomena in biology is that generally known as *symbiosis*—the living together of two organisms in close association. It is usually considered that this intimate relationship is of benefit to both components. Many examples occur in the plant kingdom. The lichen is probably the best known of these, being a composite plant formed of a fungus and an alga in definite union. Other well-known examples are the bacteria (*Pseudomonas radicicola*) living in the root nodules of Leguminosæ, and the Ginger-beer plant,[1] of which the lumps are composed of a yeast (*Saccharomyces pyriformis*) and a bacterium (*Bacterium vermiforme*). An intimate union can also occur between plant and animal, as in the case of the marine worm *Convoluta*, in the body of which an alga is always present, and as in the larvæ of certain aphids, coccids, etc., where yeasts occur as more or less definite structures.

Mycorrhiza.

That the roots of many plants have the threads or mycelia of fungi associated with them has become very well known during the last eighty years. It is of interest to find that cells containing fungi were first figured in an orchid (though not very clearly) by Link[2] in 1840, who observed them in the young seedling (protocorm) of *Goodyera procera*. He did not hazard a guess as to their nature—his idea being that the cells were filled with colourless granular material which finally disappeared.

At the beginning of the forties of last century the naturalists of this country who were curious in botany were very interested as to whether *Monotropa Hypopitys* was parasitic on the roots of beech in a manner similar to *Lathræa*. In 1842 we have T. G. Rylands[3] writing "On the nature of the byssoid substance found investing the roots of *Monotropa Hypopitys*." Rylands concludes that "the 'byssoid substance' is really fungoid, and performs no essential function in the economy of the *Monotropa*." It is, however, to Reissek[4] (1847) that we owe our first real knowledge. He examined numerous plants and came to the conclusion that fungi were normally present within the cortical cells of the roots of various flowering plants, being best developed in the underground roots of orchids. In these he studied most of the native and several exotic genera. He found that in *Orchis Morio*, for example, the fungus was present in almost all the cortical cells, whereas in the tropical species the fungal masses were arranged singly at the periphery. The presence of fungi was most frequent in underground roots, less usual in superficial ones and very rare in aerial roots exposed to the light. Moreover Reissek attempted to extract the fungus from the roots. In those days of imperfect technique it is not so surprising that he failed as that he should have made the attempt. The fungus he obtained he named *Fusisporium endorhizum*: it is probably one of the common saprophytic species of *Fusarium* so abundant in soils.

Another type of association between fungus and root is also well-known, particularly in forest trees. Here the fungus mycelium forms a sort of mantle round the root, in contrast to being within the cells of the cortex. Apparently Hartig first noted this type in 1840 in the extremities of the rootlets of *Pinus sylvestris* although he mistook the hyphæ for branched intercellular canals surrounding the internal cells such as are known to exist in the corky layer of the root cortex in *Juniperus* and *Thuja*. Rootlets so infected are most frequently coralloid in appearance. Gasparini in 1856 noted that such rootlets in *Castanea* and *Corylus* were surrounded by fungal hyphæ.

The term *mycorrhiza* was coined by Frank[5] in 1885 for the fungus-roots. Even at that date it was known that in some plants the fungus occurred in rhizomes as well as roots (*e.g.*, *Neottia*), and since then

[1] The Ginger-beer plant is, at the present time, being widely distributed over the country as "Californian Bees," "Macedonian (Salonika) Bees," "Mesopotamian Bees," "Palestine (Jerusalem) Bees," "Wine Bees," "Water Bees," "Balm of Gilead," etc.

[2] H. F. Link. Icones selectæ anatomico-botanicæ. II. p. 10. t. VII. (1840.)

[3] T. G. Rylands. On the nature of the byssoid substance found investing the roots of Monotropa Hypopitys. Phytologist. I. pp. 341-8 (1842.)

[4] S. Reissek. Über Endophyten der Pflanzenzelle, eine gesetzmässige den Samenfäden oder beweglichen Spiralfasern analoge Erscheinung. Naturwiss. Abhandl. von W. Haidinger. I. pp. 31-46 (1847).

[5] A. B. Frank. Ueber die auf Wurzelsymbiose beruhende Ernährung gewisser Bäume durch unterirdische Pilze. Ber. d. deutsch. bot. Gesell. III. pp. 128-145. (1885). Lehrbuch der Botanik. Bd. I. (1892), p. 264.

many cases have been found for which the term is quite a misnomer (*e.g.*, Liverworts). It is a convenient term, however, and it is better to accept it with an extended meaning rather than to restrict it to those cases for which it is etymologically sound. Frank gave special names to the two types mentioned above. He used the term *endotrophic* mycorrhiza for those forms in which the fungus occurred within the tissues of the host and the term *ectotrophic* mycorrhiza where the fungus hyphæ surrounded the rootlet as a sheath. These are convenient general terms, but it is well to remember that the two types are not absolutely distinct, as is seen, for example, in *Monotropa*, which had been well-described by Kamienski in 1883. Mycorrhizas, mainly endotrophic, have been described, either as usual, or occasional, in various Liverworts, Mosses, Horsetails, Club Mosses, Adder's Tongues, Ferns, Conifers and Flowering Plants: and in Algæ apart from Lichens we have cases of constant association of fungi and seaweeds, as, for example, in *Ascophyllum* and *Pelvetia*, which each have their attendant *Mycosphærella*. The antiquity of such associations is seen in the fact that they occur in the fossil plants *Rhynia*, *Hornea* and *Asteroxylon* from the Lower (or Middle) Devonian —vascular cryptogams which from their simple structure and age are of the greatest theoretical importance. Weiss (1904) moreover recorded mycorrhiza in fossil roots from the lower Coal measures for which he proposed the name *Mycorrhizonium*, and Osborn (1909) found fungus mycelia in the inner cortex of *Amyelon radicans* the root of *Cordaites*.

Orchid Roots.

As we have seen, fungi have been recognised in the roots of orchids since 1847. A transverse section of an infected root taken just above the root-cap shows the fungus in the cortical cells. (Fig. 1.) The distribution is more or less constant in the same orchid, but varies in different genera. It is only in the young root where root-hairs are present that the fungus is, as a rule, recognisable as such. The epidermal cells are not infected. The fungus usually enters the root through the root-hairs, but in some species it apparently is able to make use of any portion of the piliferous layer. The hyphæ[6] pass through the external layers to a more or less definite zone, where they reach their maximum development, rapidly spreading and completely filling the cells. If an exodermis be present the hyphæ pass through the thin-walled transfusion or passage cells. The first two or three cortical layers of the root are thus generally free from fungus except where the hyphæ of infection pass through them: even in these there is no balling of the mycelium in the cells. In some genera (*Habenaria*) (Figs. 1 and 14), the fungal zone occupies roughly the third and fourth layer of cortical cells. In other genera (*Neottia* and *Epipogum*) the fungal zone of the root occupies three layers or so of cells separated from the endodermis by about half-a-dozen cell rows. In other cases practically the whole of the cortex is occupied (*Cymbidium* and *Odontoglossum*). The central stele is never infected, the mycelium not entering the endodermis. The fungus also never infects the cells of the growing point of the root. Infected roots do not always show the endophyte in all their length, neither is it invariably present in a continuous zone. Infection does not generally occur once for all, but the hyphæ from the soil infect the roots in several places and if the fungal zone be of several cells thickness it is frequently seen as patches in transverse section. Nor, as a rule, are all the roots of an orchid infected. Aerial roots particularly are free from fungus, the only exceptions being where the roots are applied to the soil and are without chlorophyll. Such a case is shown in Fig. 15. Aerial roots can sometimes be found in such a position with the exposed portion green: in these circumstances if infection occur the fungus is restricted in distribution to the portion of the root without chlorophyll. In addition to cells containing chlorophyll those containing tannin, mucus, raphides and other crystals are never invaded by the fungus. Lateral roots are more frequently infected than main roots and in those genera with numerous roots (*Orchis*, *Ophrys*) according to Stahl only one out of three of the roots arising from the rhizome have fungus present in their cortex. Moreover, certain genera such as *Listera* and *Epipactis*, which have their chlorophyll particularly developed, seem to be irregularly infected, whereas plants poor in chlorophyll, *e.g.*, *Limodorum* and *Corallorhiza* are well fungussed. All orchids so far investigated possess mycorrhiza, with the single exception of the saprophytic *Wullschlægelia aphylla*.[7] Large numbers both of native and exotic species have been studied—Wahrlich,[8] for example, examined over 500 of the latter cultivated at Moscow.

Since the earliest workers, *e.g.*, Reissek, it has been known that in some cells at least the fungus becomes changed from its original thread-like structure into glary yellow amorphous masses. In fact, it was owing to this phenomenon that the fungal nature of the cell infections of these roots was not at first generally

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[6] Janse has shown that in *Lecanorchis javanica* the infecting hyphæ are sometimes united into a mycelial ribbon.

[7] Further investigation is needed on this plant. MacDougal first recorded that *Cephalanthera oregana* was free from fungus, but later found a somewhat sparse and intermittent infection.

[8] W. K. Wahrlich. Beiträge zur Kenntnis der Orchideenwurzelpilze. Bot. Zeit. XLIV. pp. 481, 497 (1886).

realized. Wahrlich paid special attention to the changes which took place and most investigators of orchid roots since then have taken note of them. Magnus[9] working with *Neottia* in which the alterations are well marked gave a clear description of the metamorphosis. He distinguished two main types of infected cells and held that there were no transitional stages. In the one type which he calls " digesting cells" (Verdauungszellen) the fungus always degenerates; in the other type, the " host cells " (Pilzwirthszellen) the fungus remains alive in the cells which lodge it and is thus able to hibernate. Magnus states that *Neottia* shows a more or less definite arrangement of these two types of cells, the digesting cells forming an outer and an inner and the host cells the middle layer. Such a regular arrangement is not usual in orchids—even in *Neottia* it is doubtful—and host cells are absent in certain native genera, such as *Goodyera*, and in most tropical forms. Bernard and Burgeff have also studied the question of the fungus digestion—the former mainly in seedlings, the latter principally in the root of *Platanthera chlorantha*. Before a hypha enters a host cell the nucleus of the latter increases in size. This action at a distance is also seen in the fact that starch disappears from the cells. The nucleus in the neighbourhood of the hypha becomes hypertrophied, often becomes modified in form and has increased attraction for stains. Where mycelial influence is great the nucleus becomes amoeboid and sometimes disintegrates : this would seem to indicate a parasitic action on the part of the fungus. The digesting cells are clearly recognisable by the degenerating mass which more than half fills the cells. The increase in the size of the nucleus is also a character as it becomes about four times its original diameter, *i.e.*, roughly sixty times the volume. The nuclei become amoeboid and put out pseudopodia which serve to attack the hyphæ. The hyphæ only stain slightly : they increase in diameter up to about double and also in length. The development in some cases is so great that the cell is quite filled with the thick mycelial mass and the nucleus is crumpled by the hyphæ. Enclosed by the pseudopodia the latter gradually lose their outline until frequently they cannot be distinguished from protoplasmic trabeculæ. The victorious nucleus then assumes a round form and normal volume and reconstitutes its chromatin network. The endophyte is reduced to an amorphous yellowish clump with indistinct contour, and is absolutely devoid of life : it is surrounded by a cellulose membrane. It would seem that as the root ages the clumps finally disappear. After the formation of the clump starch often reappears in the cell. Burgeff states that the fungus in the host cells can re-attack digesting cells when similar stages are again gone through. We shall return to the question of digestion when we consider the seedling.

Germination of Seeds.

The difficulty in germinating the seeds of orchids is one which has been known for a considerable number of years. In fact, it was not until 1804 that any orchid seedlings were described, when R. A. Salisbury figured those of *Orchis Morio* and *Limodorum verecundum*. Later, many botanists such as Link, Irmisch, Beer, etc., added to our information concerning the stages of development. Orchid growers evolved the method of sowing seeds on the soil containing the parent plant,[10] and it was in this manner, or some modification of it, that most of the hybrids known in horticulture were raised. The facts known, *i.e.*, the difficulty in germinating seeds unless placed on orchid soil and the presence of fungi in the roots, led many to suspect that the fungus was concerned in some way with the success or failure of germination.

We have mentioned that when Reissek recognised the fungal nature of the cell inclusions, he attempted to isolate them. This attempt, long before the days of bacteriological technique, was bound to end in failure and the fungus he isolated was a species of *Fusarium*, a genus which has been time and again proclaimed as the consort of the orchid root. (The genus *Nectria* also has often been assumed to be the endophyte). It is to Noël Bernard that we are indebted for our chief knowledge of the facts of orchid germination. This brilliant young French investigator began his studies on mycorrhiza in 1899, and they extended until his death in 1911. His first investigation was on the germination of *Neottia*. In 1902 in his thesis *Étude sur la tuberisation* he mentions that orchid seeds can germinate only in the presence of the root fungus and that the seedling is infected from its earliest stages. Realizing the importance of this fact he turned his attention to investigating it thoroughly and following the various ramifications of the subject. Bernard's great work *L'évolution dans la symbiose. Les Orchidées et leur Champignons commensaux*, appeared in 1909. In the same year a comprehensive work by Burgeff was published entitled *Die Wurzelpilze der Orchideen*. Both these investigators succeeded in isolating the fungus from the orchid root and growing it on nutrient media. Orchid seeds germinated without difficulty on having the appropriate fungus supplied to them. In describing the course of events full use has been made of the work of Bernard and Burgeff this being supplemented by observations made by the late Mr. J. Charlesworth and the writer.

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[9] W. Magnus. Studien an der endotrophen Mycorrhiza von Neottia Nidus-avis L. Jahr. f. wissensch. Bot. XXXV. pp. 205-272 (1900).

[10] I believe Dominy of Messrs. Veitch & Sons introduced this practice.

Joseph Charlesworth (1851-1920).

It will probably not be considered out of place here if I venture upon a few remarks concerning my friend the late Mr. Joseph Charlesworth. In the year 1913 I was invited to Haywards Heath to see his results in raising seedlings by what he styled the " pure culture method." He had succeeded in eliminating many sources of error and had achieved remarkable and consistent results in raising *Odontoglossum* and its allies by sowing seeds on nutrient media in which the appropriate fungus was growing. The probability that the mycorrhizal fungus in some way affected the germination of orchid seeds had influenced him for many years and he had earned his great reputation as a hybridist by his success in raising hybrids by modifications of the methods in common use. In an account of a visit to his establishment in 1906 it was written " Here is a veritable seedling land, thousands and thousands of them," and in 1909 " The raising of *Odontoglossum* and allied genera has become a very important business, and there are thousands of seedlings in existence. Messrs. Charlesworth are reducing it to a system." It was to one so successful by the older methods that Bernard's work made such a strong appeal, and he eventually decided to adopt the system. His culture flasks were sufficient testimony to the success of the laboratory method when placed upon a commercial scale. One was not prepared to find, however, that at the same time he had, after the age of sixty, become so embued with the new spirit as to have purchased microscopes, microtomes, ovens, stains, books, etc., and become proficient in microscopic technique. (The photomicrographs at the end of this paper are all taken from his preparations.) Naturally he did not restrict his newly acquired activities to studying orchids, but the main part of his laboratory work dealt with them, and he was especially interested in the seed from its first formation and in the relations between fungus and seed in germination. The whole of the slides were generously placed at my disposal. We, however, drew up a scheme of collaboration and mapped out a series of investigations, which unfortunately had to be discontinued owing directly and indirectly to the war. When, last year, we were both again free to resume the work he was a sick man and beyond application to research.

I should wish to repeat here for the benefit of those orchid lovers who knew so well one part of his accomplishments that the other part was equally good. The fact that he should commence laboratory work at such a late age is as surprising as is the success which he attained practically unaided. To a botanist trained in the schools many of his expressions appeared whimsical, but when he termed the small cells at the distal end of an *Odontoglossum* seed the " soul of the plant," it was as a result of finding that it was there eventually that both stem and root were laid down—and he had a happy knack of coining such expressions and, one may add, a certain persistency in using them. If his early days had been spent in acquiring a knowledge of academic botany rather than in connection with his father's wool business, there can be no doubt that the name of Joseph Charlesworth would have been writ large in the annals of British science. As the firm of Messrs. Charlesworth are carrying on the traditions of their late chief it may be possible at some future date to complete and put on record, certain of the investigations ; and it is hoped it may be possible to carry out the original plan in which his knowledge of orchid culture would have played an essential part.

Orchid Fungus.

Bernard in his first attempts to isolate the fungus from orchid roots obtained a species of *Fusarium*. When, however, he succeeded in extracting the right fungus he established a criterion which enables one to settle without doubt whether the true fungus has been isolated, *viz.*, that the endophyte is able to bring about the germination of the seed.

The fungus, when living within the cells of the plant, shows no characters which give a clue to its systematic position, but when it is grown on nutrient media it shows additional stages of development which are characteristic.

When extracted from the root and placed in a culture medium the fungus always appears to behave in the same way. The fungus spreads over the surface by the apical growth of its septate filaments. Meanwhile lateral branches arise and anastomoses take place between the hyphæ. Later, balls of hyphæ appear here and there in the culture and on the sides of the tube or flask containing them, usually some distance from the ends of the hyphæ. These balls are very similar to those which appear in the cells of the root, being formed by the rolling up of the ends of young growing filaments, and often becoming very compact. When seen in the host cells this method of growth suggests adaptation to the needs of the special environment and its presence in cultures might lead to the supposition that the character is so impressed upon the fungus that it also shows it when living free. The character is, however, not rare in the group in which we must classify this fungus.

As the mycelium becomes older shorter filaments arise with very short and swollen segments, which are

apparently rich in food reserve. (It was this appearance that caused Bernard to place the fungus in the genus *Oospora* when he first studied it). These filaments ramify abundantly and in certain forms anastomose amongst themselves and give rise to yellow or brown sclerotia[11] (Figs. 4 and 5) small spherical bodies formed of intertwined and massed hyphæ. These structures are capable of withstanding drought and other inclement conditions and are remarkably tenacious of life. Bernard has pointed out that these swollen filaments are very like those which occur in *Rhizoctonia violacea* Tul.[12] which is common on potatoes, lucerne and other crops, where it forms small, blackish, irregular sclerotia, and he considers that the orchid fungi fall into the same genus. He classed the fungi obtained from about twenty orchids as three species, *Rhizoctonia repens*, *R. mucoroides* and *R. lanuginosa*. The first, which was by far the most commonly isolated (*Lælia*, *Lælio-Cattleya*, *Spiranthes*, *Paphiopedilum*, *Cymbidium*, *Aerides*, *Bletiella*, *Cœlogyne*), does not form sclerotia. *R. mucoroides* was found in *Phalænopsis* and *Vanda*, and *R. lanuginosa* in *Odontoglossum* (Figs. 4 and 5). Burgeff, unaware of Bernard's latest results, proposed a new genus *Orcheomyces* for the reception of the orchid fungi. He fully describes fifteen species, naming them after the orchid from which he obtained them and mentions another fourteen by name : he divides them into five main groups.

A discussion of the different systematic interpretations given by Bernard and Burgeff would be out of place here and for convenience the more generally adopted name *Rhizoctonia* will be used. The diversity in the number of species is simply a case of the usual " lumping " and " splitting." Bernard found in his experiments that fungi obtained from different sources, but to which he gave the same specific names, varied somewhat in their behaviour, and it is quite probable that these physiological distinctions are related to slight morphological differences. Bernard later recognised certain of Burgeff's species as falling within his, *e.g.*, *Orcheomyces Sambucinæ*, *O. mascula*, *O. insignis* and *O. Luddigi* were regarded by him as *Rhizoctonia repens*—but he apparently took into account merely the gross characters of growth.

The endophytic fungus is able to ferment cellulose, which accounts for its ability to penetrate cell walls. Burgeff made a study of the physiological charcters of the species he isolated. He found that they were able to absorb carbohydrates in the form of sugars, these being in all cases transformed by a diastase-invertase in some species, maltase in others. Having regard to the prevalent ideas as to the function of mycorrhizal fungi it is of particular interest to note that these forms are apparently unable to fix free nitrogen : the nitrogen of organic compounds, such as peptone, can be made use of as a source of nitrogen : ammonium compounds are better assimilated than nitrates. By growing cultures in the dark and in an atmosphere devoid of carbon-dioxide he established the fact that the carbon compounds of the soil can suffice as a source of carbon.

Bernard in his experiments found that the fungi if grown in culture gradually became inactive. Cultures two years old were quite unable to bring about germination. Burgeff, on the other hand, found that his cultures after twenty-six and twenty-eight months retained their power. In connection with this point a culture of a root fungus which had been regularly cultivated for at least eight years, though not used during that time for germination, was recently tried. A very feeble germination occurred in certain of the tubes. As the activity of the fungus when it was first isolated is not known, it is impossible to say whether there is any decrease in intensity, though this is probable. The gradual attenuation with final loss of activity noted by Bernard may be a consequence of " staling " through too infrequent renewal of cultures. He found that the intensity of an attenuated form can be increased by extracting it from a plant which it had been successful in germinating.

GERMINATION OF SEEDS—*continued.*

The seeds of orchids are very small, the embryo being frequently only just visible to the naked eye.[13] They possess a single integument which is in the form of a characteristic network (Fig. 2), which varies somewhat in shape and structure in the different genera. On sectioning the seed (Fig. 3), or on viewing when stained and mounted whole there is seen to be no differentiation into cotyledon, stem, radicle, as is almost universal in flowering plants.[14] It appears to be most usual for the cells at the suspensor end of the seed to be somewhat larger than at the upper end (Fig. 3), though this is not always the case (*Cypripedium*). Sometimes the suspensor cells are permanent (*Cattleya*)—the suspensor is the stalk by which the developing seed is attached and nourished—at other times they disappear before the seed is matured (*Phalænopsis*). Seeds taken from the capsule under sterile conditions and sown on ordinary substrata where no fungus is

[11] Sclerotia are known in all groups of fungi, often reaching considerable dimensions, *e.g.* the size of a man's head in *Polyporus Mylittae* (the " black fellows' bread " of Australia).

[12] *Corticium vagum* B. & Br. var. *Solani* Burt.

[13] The embryo in Fig. 2 is approximately 200μ *i.e.* c. $\frac{1}{125}$ inches.

[14] *Bletilla hyacinthina* shows a rudimentary cotyledon according to Bernard. Treub has indicated a cotyledon in *Sobralia macrantha*, and Pfitzer records a green embryo with a differentiated cotyledon in *Platyclinis glumacea*.

present do not as a rule develop. Generally they merely swell and become green (*Odontoglossum*) though sometimes even this does not happen (*Epidendrum*) ; in other cases they may form stomata and the rudiments of hairs (*Cattleya*). The only case so far known in which any considerable development can take place under these conditions is *Bletilla hyacinthina* where Bernard found that thin slender seedlings developed with distinct leaves. The food reserve of orchid seeds is most frequently oil, part of which becomes transformed into starch. The reserve food comes to its end just as the seed commences to become green. This is usually after three or four months, during which time very little, if any, nutriment can be obtained from the substratum, as absorbing hairs are lacking. If no fungus infection take place then, the seedling dies. It is somewhat surprising that after the production of chlorophyll death should occur rather than autonomous growth by aid of photosynthesis : the seedling appears to form chlorophyll as a sort of last despairing effort.

If, however, the appropriate fungus (*i.e.*, the fungus from the root of the parent or some closely allied plant) be added now at the latest, an extraordinary change takes place. The fungus seems to give an impetus to development.

In the culture flasks it is only in prearranged experiment that infection takes place at such a late stage. The fungus enters the seed usually within a few days. The course of events may be made out from the photomicrographs, which are taken from different genera in order to show the general similarity in the phenomena. Entry takes place at the suspensor end of the seed by the suspensor cells themselves, if such be retained. The cell walls here are unmodified, though the general surface of the seed is slightly cuticularized. As we have seen, the cells at the suspensor end of the seed are generally larger, and it is into these that the fungus passes. (Figs. 3, 6, 7, 8). The cells are invaded by degrees, the hyphæ becoming twisted into a ball in each cell before passing on to the next. Almost immediately the smaller cells at the opposite end of the seed undergo division. It is here that the meristem of the stem is laid down. The meristematic cells in orchids are never entered by the fungus : the only cells capable of division which ever harbour the endophyte appear to be those of the seed where it first enters. Eventually the developing seedling takes on a swollen shape most frequently more or less turbinate (Figs. 9, 10).

Bernard uses the term "protocorm" for this swollen tubercle and regards it as of theoretical importance, as it simulates the protocorms of Lycopods and the colourless underground prothalli of Adder's Tongues, etc. It is of interest to remark that a similar structure, also associated with fungi, occurs in the primitive fossil plant *Hornea* from the Devonian. The fungus remains restricted to the larger cells and follows in the wake of their division. The epidermal layer is free from infection. Meanwhile the rapid division taking place in the smaller cells at the anterior end of the seed gives rise to the young stem apex and the first leaf (cotyledon). About the time this young leaf becomes visible to the naked eye the cell-division has become extended along the axis and the beginning of the central stele is seen (Fig. 10). In this manner the young root is formed and begins to absorb its way through the tissues of the protocorm (Fig. 11). Finally it passes out into the soil (Fig. 12). In no orchid studied in the present series (*Odontoglossum*, *Oncidium*, *Cattleya*, *Cymbidium*, *Vanda*, *Cypripedium*, etc.) does the developing root when passing through the tissues enter the fungal zone nor do the hyphæ extend into the root. In fact there is often a suggestion of a delimiting membrane separating the two areas (*cf.* Fig.12). Thus when the root enters the soil it is absolutely free from infection ; in none of the usually cultivated orchids does the root receive fungus from the swollen protocorm. Infection takes place from the soil most frequently when the root is about a quarter of an inch in length, the hyphæ entering by the root hairs a little behind the region of greatest growth. This throwing off of the fungus, as it were, is repeated in orchids with tubers which do not retain their roots : the tuber is not infected and the new roots receive their fungus from the soil. In fact, in orchids so far studied it is only in the saprophytic *Neottia* that constant infection obtains. Here infection progresses gradually from the widely infected protocorm into the body of the plant, gains the rhizome and infects the successive roots. The region of infection is thus perfectly continuous throughout the plant from the tip of the protocorm to the base of the inflorescence : as Bernard remarks, according to the evidence the whole of the mycelium harboured by a *Neottia* has for its single origin the mycelial filament which first penetrates the embryo.[15]

The question arises as to whether root infection *per se* is obligate in orchids with abundant chlorophyll or whether it is a necessary evil. If the latter, one would expect the fungus to be lodged in the roots, though restricted in distribution. As stated above, all the cells entered seem to act as digestive cells in cultivated orchids. Is such digestion a device for protection or for nutrition ?

What has been happening to the fungus during these stages ? The course of events was first followed by Bernard. As we have seen, the fungus enters at the suspensor end of the seed by the cells of the suspensor

[15] The association can be even more close under certain conditions. Flower scapes are frequently unable to pierce the humus covering them and the flowers and seeds develop underground, sometimes beneath the root-tufts which produce them. Mycelium apparently from the rhizome of the plant passes up the central cavity of the stem and infects the seeds in the subterranean fruits which are thus able to germinate.

near the point of attachment (*Odontoglossum*) or by the cells of the pole of the embryo where the suspensor is attached (*Vanda*). There appears to be an attraction, though feeble, towards the place of entry. The first filament entering the seed apparently excludes all others, though it may be of an attenuated form and unable itself to bring about germination. Bernard compared this with vaccination : the infection immunizes the seed. In successful germinations the fungus, after seed entry, follows the development of the cells forming mycelial balls in all the posterior portion of the seedling. According to Bernard, when the fungus reaches the cells bordering on the meristematic region digestion takes place. This is regarded as being analogous to phagocytosis such as occurs in animals where the white corpuscles of the blood attack, engulf and digest any invading micro-organisms : the cells in which the digestion takes place are the phagocytes.

In general these may be regarded as definite cells often recognisable, even before infection on account of their nucleus sometimes becoming lobed. The balling of the fungus in the cells is compared with agglutination, and the manner in which this occurs only in cells of the developing seedling which have achieved their growth is compared with cases of mortal infection where the balling is abandoned sooner or later and the fungus grows on in every direction and invades all the tissues indifferently.

Digestion eventually takes place in all the more deeply lying cells, while the external layers act as host cells. The fungus can pass out of the protocorm by way of the hairs present on its surface.

This application of the theory of phagocytosis is a most attractive one. Gallaud[16] first suggested the similarity of the function of the digestive cells and that of phagocytes, but it is to Bernard that we owe the working out in detail.[17] Much investigation on the germinating seed is still needed. Bernard's account of the distribution of the phagocytes is not satisfactory. As the photomicrographs (Figs. 10, 12, 13) show it is not unusual for all the infected cells of the protocorm to be able to digest the fungus eventually.

Germination Without Fungus.

How far is it possible to replace the fungus by artificial conditions ? Bernard concluded from a consideration of the way in which the endophyte can act at a distance, *i.e.*, bring about changes in cells to which it has not access, that there is a general modification of the physico-chemical properties of the sap which can reach all the tissues. He tried the effect of solutions of salep and saccharose of increasing concentrations on seeds of *Bletilla*, *Cattleya* and *Lælia*. In *Bletilla* where, as we have seen, germination takes place with the formation of slender seedlings in the absence of fungi, in high concentrations most of the seedlings showed thickened protocorms and short internodes comparable with fungus infected individuals. The seeds of *Cattleya* and *Lælia* at low concentrations swell and become green. With higher concentrations development is always much slower and more irregular than with fungi, but one can obtain seedlings of quite normal appearance. As the concentrations increase the development is increasingly better, but more irregular : but there is an upper limit beyond which there is no germination.

Thus it appears that augmentation of the culture medium can, in certain cases, supply the place of fungus action. In fact Bernard states that in the condition of his experiments it was more certain and easier to germinate certain seeds by the action of concentrated solutions than to have recourse to fungal infection. Germination was slow, but very regular, the protocorms had a normal appearance and the seedlings when fairly developed could be transplanted. Experiments showed that *Rhizoctonia* was able to increase the concentration of the solutions in which it grew and Bernard considered it probable that it acts similarly in orchid tissues and increases the degree of concentration of the sap. This problem of autonomous germination recalls to mind that of parthenogensis—the development of an ovum without the intervention of a spermatozoon. The egg possesses all the substances necessary for activation : the spermatozoon is an inciting cause of these reactions within the egg system on which development depends. Parthenogensis occurs naturally in certain groups, but it has been brought about experimentally in numerous cases where fertilization normally obtains.[18 and 19] Apparently the first successful attempt was made by Tichomiroff in 1886, who stimulated the unfertilized ova of the silk moth to development by rubbing them between two pieces of cloth. Various methods have since been used such as treatment with fatty acids, certain salts such as barium chloride, lipoid solvents such as chloroform, hypertonic and hypotonic solutions, etc.[20]

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[16] F. Gallaud. Etudes sur les mycorrhizes endotrophes. Rev. Gen. Bot. XVII. pp. 5 et passim. (1905).

[17] Bernard (1911) also showed that the bulbs of *Loroglossum* contain a diffusible substance which has a fungicidal effect on *Rhizoctonia*.

[18] F. R. Lillie. Problems of Fertilization. Univ. of Chicago Science Series. (1919).

[19] Y. Delage and M. Goldsmith. La parthénogénese naturelle et expérimentale. Paris. (1903).

[20] The only case in which parthenogensis has been induced in the entire vertebrate phylum is in the frog, where Bataillon in 1910, after years of vain attempts, finally succeeded by the exceedingly simple method of pricking the eggs with a fine needle. It is necessary that blood or tissue extract should be carried into the egg by the needle. This method has been abundantly confirmed and tadpoles so obtained have been reared to maturity by Loeb and Bancroft.

Another significant similarity is that artificially activated eggs always show a marked slowness in their rate of development, even with the best methods, as compared with the fertilized eggs. This suggests, according to Lillie, some factor that has not yet been successfully imitated in any artificial way. Is it possible that in both cases accessory food factors (vitamines) may play a part ? In considering the case of seeds it might be pointed out that there are many instances of peculiar germination known in other phyla. Pinoy[21] showed that spores of Myxomycetes such as *Chondrioderma difforme* do not germinate unless bacteria are present. Ferguson[22] discovered that the only way in which she could germinate the spores of the common mushroom effectively was by having a little mycelium of the fungus present in the cultures and Servettaz[23] found that a species of *Oospora* activated the growth of the moss *Phascum cuspidatum* to a remarkable degree, though the favourable action was of short duration in the conditions of his experiments.

Gastrodia.

An unusual and interesting type of mycorrhiza occurs in *Gastrodia elata*[24], a non-chlorophyllous orchid widely spread throughout Japan, where it occurs mostly in woods under *Quercus serrata* and *Q. glandulifera*. The full-grown flowering tuber is oblong and slightly curved, attaining almost without exception a length of 10-17 cm. This tuberous rhizome is the whole vegetative part of the plant and consists essentially of parenchymatous cells. Multiplication usually takes place by the tuber. It produces long rhizomes from its apex or node, upon which stalked off-sets are developed. At the end of autumn the mother body and the pedicel of the off-set undergo degeneration, so that the daughter tubercles are set free. Unless the mother tuber has been infected with the necessary fungus the off-sets decrease in size with each successive generation, until they become so much reduced and deficient in food materials that they are incapable of further multiplication. The fungus necessary for proper development is not a microscopic mould as in the other orchids studied, but *Armillaria mellea*, the well-known "honey fungus." This toad-stool is extremely common in our woods where it is a most destructive parasite, "indeed more trees die, in Europe at any rate, from attack by this fungus than through any other parasitic agent."[25] The fructifications are found generally on or near stumps. If the earth beneath the toad-stool be dug up it will be found to contain one or more black strands, resembling bootlaces, which are attached to the base of the stem. These rhizomorphs, as they are called, consist of densely compacted fungus mycelium. Further, the mycelium in the wood of the tree itself is first felted and grows up through the cambium to a considerable height : when the tree is dead and the bark has become loosened the mycelium is transformed into a tangled mass of flattened rhizomorphs. Early mycologists considered that they were here dealing with three different species of fungus—the toad-stool (*Agaricus melleus*), the rhizomorph under the bark (*Rhizomorpha subcorticalis*) and the rhizomorph in the ground (*Rhizomorpha subterranea*).

It is with the subterranean rhizomorph that we are here concerned. It forms a cylindrical, smooth, black strand, usually 1 to 1·5 mm. in thickness. Its peripheral portion, the so-called cortex, consists of compact, pseudoparenchymatous, brownish mycelium with a comparatively thick wall. The middle layer is composed of a bundle of large thin-walled mycelia with numerous septa. The inner cavity of the strand is traversed by a loose bundle of very fine longitudinal hyphæ rich in protoplasmic contents.

When the tuber of *Gastrodia* is attacked by the rhizomorph, infection is effected by a sucker-like branch of the strand which penetrates the cortical cell layers, partly compressing the underlying cells and partly dissolving their walls. This mode of infection is, of course, quite different from the ordinary endophytic mycorrhizal type where infection is affected as a rule by a single hypha (*cf.* p. iii). It very much resembles the manner in which the parasitic *Cuscuta* attacks its hosts, the rhizomorph creeping over the surface of the tuber and giving off the infection branches at intervals. On entering the tuber the hyphæ of the various portions of the strand essentially retain their structure. The infected area of the tuber may be divided into three regions, according to the structure of the cells and the nature of the hyphæ contained within them. The external region is composed of two or three layers of cells which contain a densely entangled mass of comparatively thick-walled hyphæ ; the middle region is similarly composed, except that the hyphæ are generally thin-walled and of various breadths and often arranged as a pseudoparenchyma; the innermost

[21] E. Pinoy. Rôle de bacteries dans le développement de certains Myxomycetes. Ann. Inst. Pasteur. XXI. pp. 632. (1907).

[22] M. C. Ferguson. A preliminary study of the germination of the spores of Agaricus campestris and other Basidiomycetous fungi. U.S. Dept. Agric. Bureau of Plant Industry. Bull. No. 16 (1902).

[23] C. Servattez. Recherches expérimentales sur le développement et la nutrition des mousses en milieux stérilisés. Ann. Sci. Nat. 9 ser. XVII. pp. 111-224 (1913).

[24] S. Kusano. Gastrodia elata and its symbiotic association with Armillaria mellea. Journ. Coll. Agric. Imp. Univ. Tokyo. IV. 1-66 (1911).

[25] W. E. Hiley. The fungal diseases of the common larch. Oxford (1919).

region has large cells each containing a few, slender, slightly curved hyphæ. The three regions correspond to the zones in the rhizomorph. The hyphæ of each region show characteristic alterations. They are permanent in the first region ; in the second they undergo self-disorganization ; while in the third they are mostly consumed by the cells of the host. The mode of development of the fungus in the middle region simulates the ordinary clumping seen in most orchids, but the course of events is different in that the protoplast is consumed by the hyphæ before their collapse takes place. The destruction of the protoplast shows the parasitic properties of the hyphæ. The cells of the inner regions are apparently metabolic centres of the orchid where the food materials are elaborated. The nucleus and cytoplasm undergo remarkable alterations, and secondary products appear indicating considerable activities. After the disappearance of the hyphæ the nucleus resumes its original form and structure, while the cytoplasm again becomes fibrous and vacuolate. Starch grains disappear from all the mycorrhizal cells, to reappear in the inner region with the cessation of metabolic activity.

The association of tuber and rhizomorph takes place quite occasionally. If a tuber forms mycorrhiza it can give rise to a full grown off-set which remains dormant during the winter and develops the inflorescence axis in the following year : otherwise no flowers are produced.

So far no results have been published as to the germination of the seeds of *Gastrodia*. One would expect that fungal infection is necessary for seedling development, but whether the fungus is a form like *Rhizoctonia* or whether there is some adaptation by which *Armillaria* becomes operative remains to be seen. In either case the facts will be of the greatest theoretical interest.

The course of events in *Gastrodia* gives some support to the idea that the relation of fungus and orchid is primarily one of parasitism on the part of the former. At times the rhizomorph attacks tubers and destroys them in a manner similar to that in which it treats potato tubers. Usually, however, the fungus is kept well under control and its hyphæ prevented from spreading beyond their apportioned region—and even so being absorbed by the orchid cells. It is difficult to see what benefit the fungus can gain under these conditions. The subterranean strands are apparently unable to obtain nutriment from the soil, their function in the usual life of the fungus being that of " runners." It would seem that *Gastrodia* has turned the attack of these into one of service for transmitting nutriment from the oak stumps to which the fungus is attached, for its own benefit : a colourless saprophyte unable to grow or to flower without the aid of one of the most destructive parasites known !

Number of Seeds and Distribution of Fungus.

When one sees the dense masses of seedlings thriving in the culture flasks one contemplates as to the course of events under natural conditions. The enormous numbers of seeds which are usually produced in the capsules of orchids must have struck the most casual observer. " Not that such profusion is anything to boast of ; for the production of an almost infinite number or seeds or eggs, is undoubtedly a sign of lowness of organisation. That a plant, not being an annual, should escape extinction, chiefly by the production of a vast number of seeds or seedlings, shows a poverty of contrivance, or a want of some fitting protection against other dangers." Darwin[26] estimated that in *Cephalanthera grandiflora* a single capsule contained 6,020 seeds and that, therefore, a plant with the usual four capsules would have 24,080 seeds. Similarly *Orchis maculata* had 6,200 seeds in a single capsule, and thus a plant having the not unusual number of thirty capsules would produce 186,300 seeds : " As this orchid is perennial, and cannot in most places be increasing, one seed alone of this large number yields a mature plant once in every few years." In order to retain the number of individuals of a species stationary it is only necessary that one mature plant should be produced during the period of growth of the parent—if more occur the species will tend to oust out all other species. " Linnæus has calculated that if an annual plant produced only two seeds—and there is no plant so unproductive as this—and their seedlings next year produced two, and so on, then in twenty years there would be a million plants.. . . It would suffice to keep up the full number of a tree, which lived on an average for a thousand years, if a single seed were produced once in a thousand years, supposing that this seed were never destroyed, and could be ensured to germinate in a fitting place."[27] To give an idea of what the above figures for *Orchis maculata* really mean Darwin worked out the possible rate of increase. " An acre of land would hold 174,240 plants, each having a space of six inches square, and this would be just sufficient for their growth ; so that, making the fair allowance of 400 bad seeds in each capsule, an acre would be thickly clothed by the progeny of a single plant. At the same rate of increase, the grandchildren would cover a space slightly exceeding the Isle of Anglesea ; and the great grandchildren of a single plant would nearly (in the rate of 47 to 50) clothe with a uniform green carpet the entire

[26] C. Darwin. Fertilisation of Orchids. (1862).
[27] C. Darwin. Origin of Species. (1859).

surface of the land throughout the globe "—and as *O. maculata* is perennial, the parent plant would still be alive !

But even these numbers in our native orchids are much exceeded by those of tropical species. Scott estimated that a capsule of *Acropera* contains 371,250 seeds and, judging from the number of flowers borne by the plant, the total number of seeds for an indivivual would be 74,000,000 : Charlesworth estimated 825,000 seeds for a single capsule of *Cymbidium Traceyanum* : Muller 1,756,440 seeds for a single capsule of *Maxillaria.* It appears to be a general biological rule that where the conditions of successful germination are difficult of attainment a prolific number of seeds (or spores) are produced and *vice versa*, where the requirements are not of a specialized nature, a smaller number occur.

In the case of orchids it seems not unlikely that the enormous seed production is in some way related to the fungus question. Their small size, their lightness, their net-work integument and the presence in some genera of elaters ensure their effective dissemination. But unless the necessary fungus be to hand no germination occurs—the seed may develop to a certain extent, but it does not produce roots unless the appropriate fungus enters its cells.

So far, however, we know nothing of the distribution of these fungi in nature except so far as they occur associated with rooted orchid plants. Probably most people are aware that fungi of all kinds are present in the soil, but few realize in what enormous numbers they occur and the manner in which some are restricted to the soil. Hagem[28] calculated that in a gram of soil from a potato field, 350 spores of *Rhizopus stolonifer* and 250 each of *Mucor sphærosporus*, *M. nodosus*, *Absidia cylindrospora* and *Zygorhynchus Moelleri* were present ; and these numbers are much exceeded by *Penicillium* (90-95 per cent. of spores in uncultivated soil according to Sopp[29]) and other Hyphomycetes. Traaen[30] calculated that from 10,000 to 120,000 spores of *Geomyces vulgaris* and from 1,000 to 20,000 spores of *Humicola fuscoatra* occur in a gram of soil. Much work has been done recently on the biological activities of such fungi, attention being paid chiefly to cellulose destruction and the possibility of nitrogen fixation. It is extremely probable that certain of the forms isolated are capable of acting as mycorrhizal fungi, though none have apparently been recognised as such. Further it is possible to isolate *Rhizoctonia* from the soil in the immediate neighbourhood of orchid plants growing wild (as also from the soil of pots containing cultivated orchids) : but notwithstanding the large number of species of soil fungi isolated it does not appear to have been found, or at least recognised, by any investigator. We are thus lacking in data as to the distribution of orchid fungi in the soil. Since, however, Bernard isolated *Rhizoctonia repens* from many European orchids and showed it to be the commonest endophyte amongst cultivated species, it must be of world-wide distribution, since in order to account for the distribution of the orchids it is necessary to assume that this particular fungus must occur practically wherever orchids grow.

Ericaceæ.

A family of plants which is usually linked with orchids as showing the same constancy of fungal infection is the Ericaceæ. Frank early realized that the relation between the fungus and flowering plant in these two families is a particularly close one. In certain ericaceous plants he remarked on the absence of root-hairs, the absence of, or reduction in, the amount of cortical tissues, the reduction of the root-cap, and the masses of fungus mycelium in the enlarged cells of the epidermal layer. Ternetz[31] was successful in isolating the fungi from certain species and growing them in pure culture, constantly obtaining the same fungus from the same species of flowering plant. All the fungi belonged to genus *Phoma*[32]—one of the Fungi Imperfecti, but of a totally different group than is *Rhizoctonia*—and were apparently morphologically and physiologically distinct. She showed that infection of *Calluna* took place in the seedling and also found infection in a case of viviparous germination in *Andromeda.*

Rayner[33] working with *Calluna vulgaris* was able to show that the full development of the seedling was dependent upon the presence of the mycorrhizal fungus—there is here an " obligate symbiosis " of a type very similar to that in orchids. Finding that the sterile seedlings were unable to form a root-system she investigated the matter in the manner made classical by Bernard. The seed coats were found to become infected while the seeds are still in the ovary. Delicate branched hyphæ are present in the cells of the ovary wall, in the tissue of the central column and in the funicles of the seeds. Branches of this mycelium grow

[28] O. Hagem. Untersuchungen über Norwegische Mucorineen II. Skrifter Vidensk-Selsk. Christiania. I. Math.-Natur. Kl. No. 4 (1910).

[29] O. J. O. Sopp. Monographie der Pilzgruppe Penicillium. idem. No. 11 (1912).

[30] A. E. Traaen. Untersuchungen über Bodenpilze aus Norwegen. Nyt. Mag. Naturwidensk. LII. pp. 19-121 (1914).

[31] C. Ternetz. Über die Assimilation des atmosphärischen Stickstoffs durch Pilze. Jahr. f. wissensch. Bot. XLIV. pp. 353-408 (1907).

[32] *Phoma radicis-Oxycocci*, *P. radicis-Andromedæ*, *P. radicis-Vaccinii*, *P. radicis-Tetralicis and P. radicis-Ericæ.*

[33] M. C. Rayner. Obligate symbiosis in Calluna vulgaris. Ann. Bot. XXIX. pp. 97-133 (1915).

across from the cells of the ovary wall to those of the seed-coats, extending from one seed to another. The fungus was isolated and grown in pure culture. It proved to be a pycnidial form similar in all respects to the genus *Phoma*. Sterile seeds sown on this develop normally, whereas in its absence the seedlings merely form a few reddish or chlorotic leaves, but no roots. Infection of the seedling root takes place at, or immediately after, it emerges and may begin at the tip by hyphæ forcing their way between the cells of the apex, though more usually it occurs simultaneously at several points. The mycelium immediately becomes intercellular and infection spreads rapidly from cell to cell. Some hyphal branches grow out and infect fresh rootlets as they develop ; others form a tangled skein of fine hyphæ in the superficial cells. One of the most interesting points of the story is, however, that the fungus does not remain confined to the roots but infects the whole of the young seedling. In the subaerial parts the mycelium does not develop so extensively on the surface of the plant, nor do the hyphæ become balled up in the superficial cells as in the roots, but are irregularly distributed in the tissues. In the mature plant likewise the fungus is not confined to the roots but is present in the tissues of the stem, leaf, flower and fruit. The hyphæ can also be seen ramifying among the hairs or closely applied to the cuticle of the epidermal cells : they show no preference for special points of entrance or egress, penetrating with equal ease the cuticularized cells of the epidermis or the base of a hair. The ovary—and later the young fruit—contains mycelium in all parts of the internal tissues. This mycelium infects the seed coats of the developing seeds. The embryo and endosperm of the resting seed are free from infection.

Thus, as in *Neottia*, we are dealing, except in the seed, with a dual organism. The type of association is, however, different from what obtains in the orchids so far studied, where no such distribution has been found—and an analogous constancy apparently only occurs in non-chlorophyllous genera. From the fact that Rayner has recorded the presence of ovarial infection in a number of Ericaceæ—Rhododendroideæ, Arbutoideæ, Vaccinioideæ and Ericoideæ—it may be that the fungus is similarly distributed throughout the tissues of these plants, and presumably obligate symbiosis is to be inferred.

In no other case has the necessity of the presence of the mycorrhizal fungus for germination been proved. There can be hardly any doubt, however, that such a phenomenon is not restricted to two groups so widely separated as the Orchidaceæ and the Ericaceæ. What have these families in common ? Apart from the similarity in habitat of certain species there seems to be nothing except the smallness of their seeds—and it is naturally to seed characters that one looks in this connection. As we have seen, the seeds of orchids are exceedingly small ; reduction in most genera would appear to have reached its limit. In typical Ericaceæ the seed is very small, rarely exceeding 2 mm. and often less than half this size. There is a richly developed endosperm in which a straight embryo is embedded one-half to two-thirds the length of the seed, always showing a root, an axis and two cotyledons more or less differentiated. It is also of interest to remark that such genera as *Kalmia* and *Ledum* have a net-work integument to the seed.

Pyrolaceæ.

Allied to the Ericaceæ is the family Pyrolaceæ with the sub-families Pyroloideæ and Monotropoideæ. In families of flowering plants which show saprophytism and parasitism there usually occur green purely autophytic plants, with typical green leaves and numerous flowers ; plants that are purely saprophytic or parasitic, with colourless scales and a reduced number of flowers ; and all gradations between. Henderson[34] instances the families Burmanniaceæ, Orchidaceæ, Gentianaceæ and Ericaceæ as examples of this. Regarding the Pyrolaceæ as a saprophytic sub-family of the Ericaceæ we can trace a relation between increasing saprophytism and a more intensive development of mycorrhiza. In the root tip region we get an ascending series in the amount of fungus present from *Chimaphila umbellata* where the epidermal cells of some roots are without hyphæ and other roots with hyphæ, but not in every cell, to *C. maculata* with a greater number of the epidermal cells filled with hyphæ ; in *Pyrola rotundifolia* and *P. elliptica* all the cells are infected, and there is the beginning of intertwined hyphæ round the root tip ; then in *Monotropa Hypopitys* an increase in the width and extent of the sheaths and a division into two zones—an outer loosely woven mass of hyphæ and an inner more compact one—and finally in *M. uniflora* a still greater width of the fungal sheath. In the least saprophytic species the epidermis soon dies off, carrying with it the fungal hyphæ as in *Chimaphila* and *Pyrola*, whereas in *Monotropa*, especially *M. uniflora*, the epidermis is still living and filled with hyphæ when the root is quite old.

Corresponding with this increase in saprophytism there is an increase in the number of seeds produced and a reduction in their size and structure. "The endosperm in the Pyrolaceæ consists of relatively few large cells—the embryo of about twenty-five to thirty cells with no trace of cotyledons. In the Monotropaceæ

[34] M. W. Henderson. A comparative study of the structure and saprophytism of the Pyrolaceæ and Monotropaceæ with reference to their derivation from the Ericaceæ. Contrib. Bot. Lab. Univ. Pennsylvania. V. pp. 42-109 (1919).

the number of endosperm cells is still less and the cells are larger, the embryo also is very small, composed of only nine or five cells." As these seeds also have their integument in the form of a net-work there is an exceedingly close superficial resemblance to those of orchids.

Comparing the members of the Pyrolaceæ as a whole with the Ericaceæ it would seem exceedingly probable that their seeds are even more dependent upon infection by the mycorrhizal fungus than are those of their chlorophyllous relatives. It will be interesting to learn at what stage infection takes place and whether or not a close approximation to the more advanced orchid type obtains. It is probable that the fungus will be found to be generally distributed in these plants as in *Calluna*.

Burmanniaceæ and Gentianaceæ.

The other two families in which mycorrhizas are typically developed are the Burmanniaceæ and the Gentianaceæ[35]—in fact Stahl considered that from this point of view the latter family are as important as the Orchidaceæ. Moreover, in these families the seeds are small and numerous, with little reserve food material and no chlorophyll. Further there are the typical gradations from green plants to colourless saprophytes and correlated with this is an increase in number and decrease in size of the seeds, with a change in the embryo until we end in the most reduced examples with little differentiated or formless masses, and an increasing amount of fungus in the roots. The seeds of the saprophytic genera have a network integument and in appearance bear a very close resemblance to those of orchids. The Burmanniaceæ are closely related to the Orchidaceæ, and we should expect that showing so many characters in common there would also be a resemblance in the important one of obligate fungal infection for germination. In the Gentianaceæ there are many isolated records of difficulties in obtaining seed germination in some of the genera, and it is common knowledge that many Gentians are difficult to raise from seed. It would seem extremely probable that in this family also the mycorrhizal fungus is necessary for seedling development.

Ceillier[36] has worked out in detail the relation between the presence of mycorrhiza and small seeds. In certain cases as in Juncaceæ the seeds are small and little differentiated, but as they possess chlorophyll they are able to begin photosynthesis immediately on sowing. Small seeds with much reduced embryos, also occur in parasitic forms such as *Cuscuta*, *Orobanche*, etc. No fungus is present in these genera, but apparently germination is not successful unless contact is made with the organs of the requisite host. It may be that the stimulus necessary in these cases is analogous to that requisite to bring about root formation in plants with obligate mycorrhizas.

Origin of Saprophytism.

What is the trend of evolution in plants of which the roots are normally infected with endophytic fungi ? A general survey of families in which endotrophic mycorrhizas are typically developed shows that it is the rule for these families to have small seeds ill-adapted for successful germination. It has also been proved for orchids and for *Calluna* that the seeds need to be infected by the mycorrhizal fungus before the seedling can produce roots. Further it is in these families that typical saprophytic species occur (if we concede that the Pyrolaceæ are saprophytic Ericaceæ) : in fact the presence of fungi in the roots of saprophytes is so common (the apparent exception being *Wullschlægelia*), that MacDougal regards these seed-plants as being "saprophytic symbionts."[37] Without the necessary data it is doubly unsafe to theorise, but it suggests itself that in families adapted to a mycorrhizal habit there is a tendency for the seed to become dependent upon the fungus for successful germination, and there is a correspondingly greater production of seed. It has been customary to associate increasing saprophytism with the greater development of mycorrhizal fungus. May it not be rather that saprophytism has arisen by the mycorrhizal fungus taking over some of the functions necessary in germination and relieving the flowering plant of the need of excessive food production for the developing seed and thus of the necessity for carbon assimilation ? (The great amount of fungus in the roots of saprophytes militates against the idea that the root may be simply a lodging place for the fungus to be at hand for germination and of no use in nutrition). We see in *Calluna* an almost perfect device for the infection of the seed, and the fungus is generally distributed. The most general infection so far

[35] "Most of the Orchideæ are humus-plants, and it is noteworthy that dicotylous saprophytes, such as the Pyrolaceæ, the gentianaceous *Voyria*, and others, show a reduction of the embryo like that of the Orchideæ. In *Monotropa* the embryo has but nine cells. The germination of the seeds of these dicotylous saprophytes is unknown. It takes place only in the presence of very special surroundings. Probably the fungi which are found in the roots in symbiosis are essential. The smallness of the seeds allows of a large number being formed, and thus the probability that one of the seeds at least will reach favourable conditions for germination is increased." Goebel, *Organography of Plants*. Part II. pp. 254. [1898] 1905.

[36] R. Ceillier. Recherches sur les facteurs de la répartition et sur le rôle des mycorrhizes. Thôse. Paris (1912).

[37] Johow (1889) places all the known saprophytic flowering plants in the six families Orchidaceæ, Burmanniaceæ, Triuridaceæ, Pirolæ, Monotropeæ and Gentianaceæ. (The Triuridaceæ are a small family of tropical saprophytes with the two genera *Sciaphila* and *Triuris* and about forty species).

found in orchids is in *Neottia*, which, as has been pointed out above, is most comparable with *Calluna*. But *Neottia* is saprophytic. In chlorophyllous orchids it almost looks as if when the necessary stimulus is given for seed germination precautions are taken to prevent general infection, the primary root even being free. In orchids digestion of the endophyte may also be a means of preventing general infection (though in *Neottia* this property can be easily recognised). Does such a general infection as we get in *Calluna* ultimately lead to saprophytism of the type seen in the Pyrolaceæ ? Are the events described above in the germination of certain orchids an effort to prevent general invasion and the " perfect symbiosis " of *Neottia* ?

Lolium.

A case which recalls to mind that of mycorrhiza—especially having regard to recent discoveries—is that of the grass *Lolium*. The fact that the grains of *Lolium temulentum* contain a layer of fungal hyphæ situated between the aleurone layer and the fruit and seed coat was first demonstrated by Vogl in 1898, and since then has been many times investigated in different species of the genus. The latest worker is McLennan[38] who used *Lolium perenne* for her researches. The fungus is far more common in the genus than has hitherto been thought, and it is remarkably constant. Every seed examined (169 of *L. temulentum* and 115 of *L. perenne*) showed infection. The fungus is endophytic, occurring within the cells. It is present in the embryo sac at, or immediately after, fertilization : thus there is a material difference from what happens in orchids and *Calluna*. The fungus increases in quantity at the expense of the nucellus and the cells of the carpel wall. As the endosperm is formed the fungus is absorbed as a source of food supply for the developing embryo. The ovum is infected before any divisions have taken place in it.

The hyphæ already in the very young embryo, follow the development of the stem-apex and remain localised in their growth until germination takes place. The growth of the fungus keeps pace with that of the plant : the hyphæ, however, are mainly restricted to the growing apex, but can be seen extending for a short distance down the stem. Even at this stage the intracellular nature of the fungus can be demonstrated. Some of the parenchymatous cells of the grass are invaded and used as a food supply by the hyphæ. When the inflorescence is formed the fungus is especially abundant at the base of the carpels. The cells so affected do not increase in size, and are only to be distinguished from normal unaffected cells by their different staining properties. It is not till the ovule is well advanced that any great increase in the fungal partner takes place. The fungus has not yet been isolated.[39] It has been suggested that it is probably a degenerate member of the Ustilagineæ (Smuts) or of the ergot type. The former would seem the more likely. Smuts attack grasses very generally and often it is the flower that is infected and later the seed, and thus the whole plant. On general grounds it would appear that the line of development to the stage found would be the gradual subjection of a parasitic fungus such as *Ustilago* rather than the further development of a typical mycorrhiza. An examination of *Lolium* roots shows that no typical endophytic fungus is present—in fact these are peculiarly absent in the Gramineæ, though recorded by Schlicht for *Holcus lanatus* and *Festuca ovina* and by Tubeuf for certain moorland grasses—and the area of infection seems limited to the region of the stem apex. Thus, though it would appear at first sight that the progress of evolution had been along a line similar to the *Calluna* type leading to infection of the embryo as apart from the seed-coat, and consequent continuous infection, it is more likely that in the typically non-mycorrhizal grasses such a union has been brought about by a subjection of a seed parasite.

Relation between Fungus and Flowering Plant.

Throughout the preceding pages incidental remarks have been made regarding the relation between the two constituents of the mycorrhizal association. The subject is one of extraordinary interest and of extreme difficulty. It does not seem possible to regard all such associations as being of the same nature or as having arisen in the same way.

As we have seen Rylands was the first to record fungi in association with roots, though his account is not very clear : his idea that the fungus performs no essential function in the economy of *Monotropa* is one that has had few supporters.

Reissek, who in many ways seemed before his time in his attitude towards the subject, regarded the regularity and permanence of the presence of fungi in orchid roots as of great importance. He apparently considered that they were not absolutely necessary for the life of the plant and suggested that the orchid could generate without the root fungus in the same way that the greater number of flowering plants are able to propagate without flowers.

The gradual realization of the dual nature of lichens brought in its train the conception of symbiosis,

[38] E. McLennan. The endophytic fungus of Lolium. Part I. Proc. Roy. Soc. Victoria XXXII (N.S.) pp. 252-301 (1920).
[39] Fuchs (Hedwigia LI., pp. 221-239 (1911)) claims to have proved that the fungus is a species of *Fusarium*.

but the increasing knowledge as to the nature of fungus-roots played a not inconsiderable part in the growth of the idea.

From the year 1862 Tulasne began to consider the relation between the False Truffle (*Elaphomyces*) and the roots of trees as one not of simple parasitism as he had previously (1841) thought, but one by which both organisms benefited in some way. Pfeffer in 1877 took up this idea of mutual benefit and made it more precise. Other workers —Treub, Goebel, Kamienski—also regarded the relation between fungus and root as of this description. It is to the work of Frank, beginning in 1885, that we owe a proper conception of the widespread phenomenon and a clearly outlined theory of symbiosis between fungus and root. Naturally as more facts both of observation and experiment were obtained Frank's original theory was somewhat modified—originally it was that plants with ectotrophic mycorrhiza did not themselves draw nutriment from the soil, but that the mycelial filaments which completely envelop the absorbent roots procure for it all its nutriment. Such roots always lack absorbent root hairs. The absence of these organs of absorption corresponding to the presence of mycelial filaments suggests that the latter take up the functions of the former. Later, the view taken was that the fungus does not necessarily nourish the roots, but draws its nutriment from the humus of the soil and passes on a portion of this to the roots. In other words the presence of the fungus allows the root to make use of certain substances of the humus that it would be incapable of utilizing in its absence. Another hypothesis which figures largely in the literature of the subject is that of Stahl[40] This author endeavours to show that the rôle of the fungus consists in furnishing the plant with mineral nutriment. Comparing plants with and without mycorrhizas he points out certain differences which always appear to indicate a much greater circulation of water in the latter. Thus their roots are strongly developed, they possess numerous root hairs, their leaves transpire energetically and are often provided with water stomata. Further, their tissues are ordinarily rich in starchy matters and poor in sugar, *i.e.*, in a condition favourable for transpiration. The fact that mycotrophic plants transpire less[41] and are in consequence less well fed in nutrient soils leads to the idea that the service which the fungus renders to the host consists in remedying the insufficiency of transpiration. Stahl imagines that the fungus hands over the products of assimilation of the salts rather than the salts themselves. There exists between phanerogams and fungi growing in the humus of forests, heaths, moors, etc., a competition for the salts which the vegetable débris already contains in a concentrated form. The advantage in this struggle would apparently be on the side of the fungi owing to their mode of life. Plants with very active transpiration are alone capable of struggling with success against fungi in soils rich in humus: plants with feeble transpiration are only able to subsist in these conditions by the help which their symbiotic fungus brings.

Magnus (1900) from his anatomical investigations regarded the digesting cells as serving for absorbing the nutriment of the fungus: the lodging cells, on the other hand, are set apart for the nourishment of the fungus on the cell contents and for its hibernation. This idea would give the classical balance of symbiosis—each component benefiting to an approximately equal degree.

Gallaud regards the communication of the endophyte with the exterior in endophytic mycorrhizas as insufficient to assure to the plant the absorption of nutritive substances. From a study of numerous types of infection he holds that the fungus when in the root leads a life independent of the exterior and that it must therefore obtain all its nutriment from the plant. Comparing its mode of life with that of fungal parasites such as Peronosporaceæ he decides against its parasitic nature and regards it as a special form of saprophyte—an internal saprophyte.

Ternetz working with the fungi from Ericaceæ records as a result of careful experiments that they are able to fix free nitrogen. From a theoretical point of view this is of extreme interest fitting in well with what is known concerning the bacteria in the root nodules of the Leguminosæ, but so many discordant results have been recorded in such studies that it would be well not to accept these without confirmation. Incidentally it may be again remarked that Burgeff was unable to show any such fixation in orchids.

Owing to the totally different complexion that Bernard's work put upon the mycorrhiza question his views are of particular interest. He regards the fungus in orchids as a parasite: an orchid suffers from a benign cryptogamic malady. Symbiosis for him represents the immunity realized by phagocytosis.

Burgeff on theoretical grounds considers that both orchid and fungus must benefit by increased power of reproduction. He is in general agreement with Stahl as to the nature of the benefit the flowering plant receives. The union arose originally from the ability of the fungus to take up carbon compounds from the soil. The function of the fungus in germination is to introduce a solution of carbohydrates into the seed by means of its enzymes.

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[40] E. Stahl. Der Sinn der Mycorrhizenbildung. Jahr. f. wissensch Bot. XXXIV. pp. 539-668. (1900).

[41] The difficulty in drying orchid plants for herbarium purposes is a result of this.

Most recent workers on ectotrophic mycorrhizas regard the fungus as parasitic. Fuchs[42] attempted to inoculate the roots of Abietineæ by adding fungus spores to the soil. He did not succeed in his experiments, but regarded the vehemence with which the young plants cut off the infected cells as an effort to prevent the attacks of a parasite.

Weyland[43] introduced the microchemical method of studying the question and it is probable that from such studies a clearer idea of what is really taking place will be obtainable, by the determination of the localization of nutriment. He considers that the fungus in an ectotrophic mycorrhiza is really a parasite and has nothing to do with symbiosis.

Weevers[44] working from a chemical point of view on the presence of ammonia and ammonium salts in plants established the fact that although ammonium salts were found in abundance in the tubercles of the Leguminosæ they were in small quantity or absent in mycorrhizal plants. He holds therefore that if fungus-roots really assimilate nitrogen it must be brought about in a manner different from that in the Leguminosae. Weevers is rather of the opinion that mycotrophic plants are, with the help of their fungus partner, able to utilize fully the organic compounds of the soil.

McDougall,[45] working with ectotrophic mycorrhizas of forest trees formed by the association of toadstools with the roots, considers that they are not in any sense symbiotic associations but must be considered as instances of parasitism by the fungi.

Rexhausen [46] studied ectotrophic mycorrhizas by the microchemical method. He considers that the fungus and the root together form an osmotic unit for the absorption of nutrient salts. These are probably made soluble for the root by the fungus. This gathering up of nutrient salts is first used by the fungus for its own benefit. The mycorrhiza is not a fixed symbiotic condition, but is dependent upon the biological condition of the soil. Where the conditions are not suitable for the growth of the fungus it acts as a parasite on the root and may damage it severely, as it cannot be kept in check. Where the fungus is well nourished it can be easily withstood by the root. Thus in good soils the mycorrhiza gradually disappears or, at all events, the fungus part becomes less.

It will be apparent from the above that many somewhat diverse theories have been put forward to account for the fungus-root association and many modifications have been proposed. No purpose would be served here by entering on a detailed criticism : the only general one we would suggest is that no benefit can result from pushing the old idea of mutual and equal advantages of the two components to its extreme. Referring only to orchids it seems most reasonable to regard the condition as having arisen from parasitic attacks by the fungus. This seems beyond doubt in the exceptional case of *Armillaria* and *Gastrodia*. The ability of the fungus to transport nutrient solutions has been made use of by the flowering plant. As in the case of Leguminosæ and their nodules the tables have been turned and the " host" has become the aggressor, even attracting the fungus to the embryo. We are short of definite facts—there is a conflicting mass of detail on such an important point as the relation between the endophyte and the soil—and until these are obtained one theory seems as good as another.

It would be indeed strange if the difference between ectotrophic and endotrophic mycorrhiza should resolve itself into a case of the fungus being parasitic on the flowering plant in the former, while in the latter the flowering plant is parasitic on the fungus.

I am indebted to Mr. E. H. Ellis for the photomicrographs, with the exception of Figs. 1 and 4, for which I must thank Mr. R. J. Tabor.

While the above was in the press an important paper by H. Christoph entitled " Untersuchungen über die mykotrophen Verhaltnisse der ' Ericales' und die Keimung von Pirolaceen " appeared in Beih. Bot. Centralbl. XXXVIII. pp. 115-157 (1921). In it the author controverts the results obtained by Rayner concerning the necessity of the root-fungus for seed-germination (cf. p. xi). It should be noted, however, that he has not seen the full description of Dr. Rayner's researches, but apparently only an abstract of her preliminary account. Christoph concerned himself with the manner in which the fungus reaches the roots of the Ericaceæ whether from the soil or from the seed. His first series of experiments were performed with cuttings. He took both large and small green side shoots from plants of *Calluna vulgaris*

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[42] J. Fuchs. Ueber die Beziehungen von Agaricineen und anderen humusbewohnenden Pilzen zur Mycorhizenbildung der Waldbäume. Bibliotheca Botanica LXXVI. (1911).

[43] H. Weyland. Zur Ernährungsphyiologie mykotroper Pflanzen. Jahr. f. wissensch. Bot. LI. pp. 1-80 (1912).

[44] T. Weevers. Das Vorkommen des Ammoniaks und der Ammonsalze in den Pflanzen. Receuil des Traveaux botaniques Néerlandais. XIII. pp. 63-104 (1916).

[45] W. B. McDougall. On the mycorrhizas of forest trees. American Journ. Bot. I. pp. 51-74 (1914).

[46] L. Rexhausen. Über die Bedeutung der ektotrophen Mykorrhiza für die höheren Pflanzen. Beit. z. Biol. der Pflanzen XIV. pp. 19-58 (1920).

both wild and cultivated. These were planted in shallow pots in humus heath soil—the soil in the one pot being sterilized and that in the other not. In both experiments a number of cuttings struck and succeeded in establishing themselves. The roots of the cuttings in unsterilized soil became slightly infected, but no fungus could be found in those growing in sterilized soil. On replanting and transferring the latter cuttings to sandy soil they still remained free from fungal infection and continued in that condition for two and a half years.

Similar experiments with cuttings of *Erica carnea* gave analogous results. Both series succeeded and those planted in sterile black heath soil, and after one and a half years transferred, remained free from fungus infection for two and a half years.

The plants without fungi in their roots were in just as good a condition as those which became infected and Christoph is of the opinion that the fungus is of no assistance to the plants and must be regarded as a harmless parasite.

A second part of the paper deals with germination experiments with these two species. The results of thirteen experiments are summarized, though the complete account is not published

Different soils were tried, both sterilized and unsterilized. Seeds of *Calluna* and *Erica* were sown in these, some having their coats sterilized, some being used just as they were taken from the capsules. The results were similar in both series of experiments, except that *Erica carnea* germinated only in the absence of light. Germination occurred in all experiments, *e.g.*, sterilized seeds germinated in sterilized soil. Only those seedlings growing in unsterilized soil become infected with fungus whether the seeds are sterilized previously or not : in certain cases seeds which were taken from capsules in which a fungus was very obvious did not give rise to infected seedlings when sown in sterilized soil. The author concludes that infection of the root always comes from the soil and never from the seed coat.

Regarding infection in the capsule, Christoph states that so long as the carpels are still green and the seed white a fungal infection of the tissue can never be observed.

The author succeeded in extracting the fungus from the roots of the plants, but was unable to obtain spores in pure culture and was therefore unable to identify it. That it was probably the appropriate fungus was shown by infecting seedlings of both *Calluna* and *Erica*.

The Ericales are considered to be facultative mycotrophic plants, since specimens growing in normal conditions always have fungus in their roots. In very dry places, however, plants of *Calluna vulgaris* and of *Erica carnea* are often without fungi ; and in pot cultures allowed to become dry the fungus soon disappears.

The third portion of the paper deals with the Pyrolaceæ. Working with *Pyrola uniflora*, *P. secunda*, *P. minor* and *P. rotundifolia* it was found that the hyphæ of the infecting fungi had clamp-connections (and were therefore probably Basidiomycetes). The conclusion reached is that here also no true " symbiosis " exists—infection depends upon many external factors, of which temperature, soil, moisture and aeration are the chief. Coralloid roots are not brought about by infection : there is a special development of the large epidermal cells and these, owing to their function of absorption, are specially suited for fungal development.

In *Monotropa* the fungus possesses no clamp connections.

The author was successful in germinating seeds of *Pyrola rotundifolia* which he chose, as they were the largest of the four species. The best results were obtained from :—1. Strong concentrated soil-extract ; 2. Addition of peptone solution ; 3. Sowing on humus from habitat of plant—on sterilized soil there was no germination ; 4. Keeping cultures in the dark ; 5. Moderate moisture.

It is suggested that the carbon compounds of the highly concentrated soil extract, acting in combination with the peptone, brought about germination by chemical action.

Parallel experiments with peptone solution alone, soil extract alone, and with a mixture of both gave a slight germination in peptone solution, a stronger one in soil extract, but much the best is a mixture of the two.

With regard to the question of infection of the seedling root from the capsule it is obvious that there is great discrepancy between the accounts of Rayner and Christoph, and until the results of one or other worker be confirmed it is not possible to draw from them theoretical conclusions. That cuttings of *Calluna* can strike and come to maturity in sterilized soil without root infection is somewhat unexpected on account of Rayner's clear description of the distribution of the fungus in the plant ; in cultivated orchids it is quite likely that after the seedling stage fungal infection is not necessary.

Concerning the germination of *Pyrola rotundifolia* seeds the account is not full enough to draw from it any theoretical conclusions. The fact that the seeds can be brought to germinate by chemical means is not surprising : it is analogous to what has been found by Bernard in *Cattleya*. There was apparently no attempt made to try the effect of the root-fungus on germination.

December, 1921.

FIGURES.

1. Transverse section of root of *Habenaria* just above the root tip. The dark masses show where digestion of the fungus is taking place. × 36

2. Seed of *Cymbidium*, stained and mounted whole. The embryo is seen as an oval black patch within the network integument. × 56

3. Longitudinal section of a seed of *Odontoglossum*. The anterior end shows smaller cells, the posterior end larger cells. (The integument has been ruptured in making the preparation.) × 215

4. Fungus from *Odontoglossum* (*Rhizoctonia lanuginosa* Bern.) at the beginning of sclerotium formation. × 36

5. The same more highly magnified showing chains of "spores." × 215

6. Seed of *Odontoglossum* sown seven days on a culture of the fungus: stained and mounted whole. × 56

7. The same more highly magnified. × 215

8. Longitudinal section of a seed of *Odontoglossum* nine days after sowing. The fungus has entered the larger cells at the suspensor end of the seed and formed balls of hyphæ. (The integument has been broken in cutting the section, *cf.* Fig. 6.) × 215

9. Section of protocorm of *Odontoglossum*. The growing point of the stem can be seen at the upper end and the first and second leaves (Section not quite median). The fungus in many of the cells is already digested. × 56

10. Later stage of *Odontoglossum* showing the beginning of the formation of the central stele and root. The stem growing-point is well developed. The fungus in the cells is mostly digested. × 36

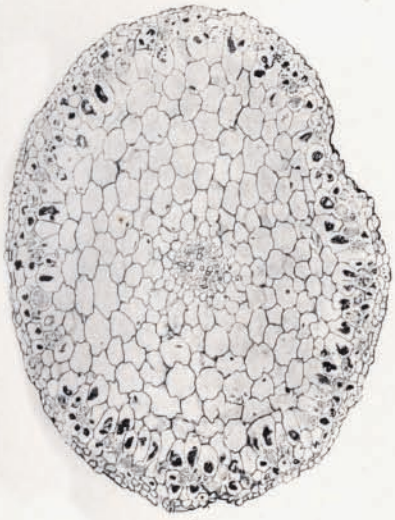
11. Protocorm of *Vanda* showing the young root absorbing its way out of the side of the protocorm away from the fungal zone × 18

12. *Odontoglossum* seedling after the formation of the first root. The root is not infected from the protocorm. (The dark patches in the root are raphides). × 36

13. Cells from fungal zone of Fig. 12 more highly magnified. The fungus is "clumped" (*cf.* Fig. 8). A fungal hypha is seen passing through the cell-wall. × 215

14. Longitudinal section of the root of *Habenaria* near the tip. Digestion is more prominent in the older (upper) portion of the root. × 18

15. Longitudinal section of an aerial root of *Epidendrum* showing infected cells in the centre and mycelium in the velamen. × 18



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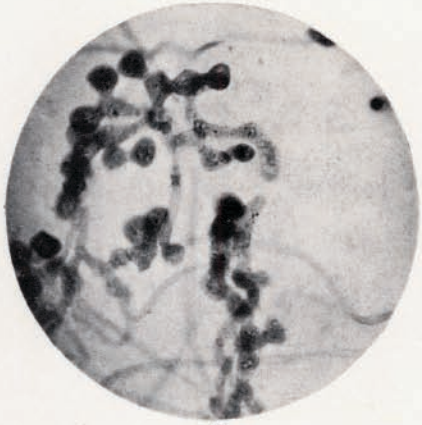

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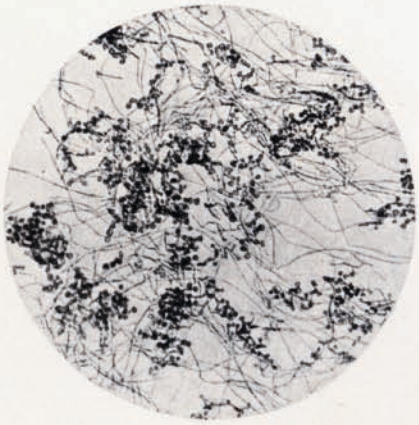

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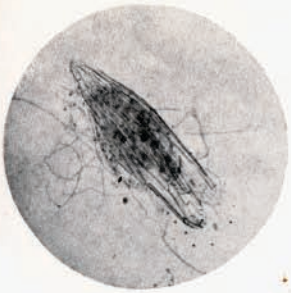

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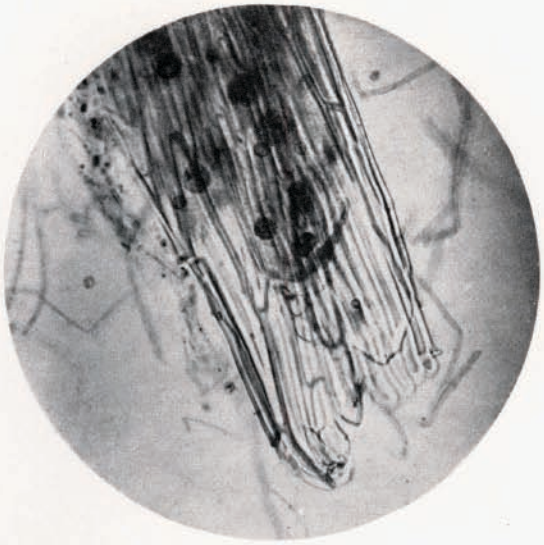

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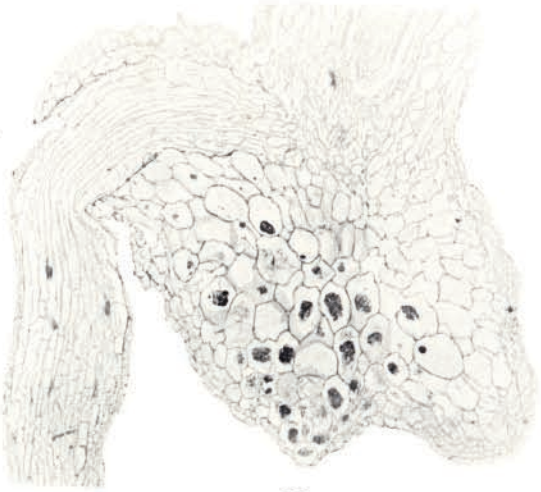

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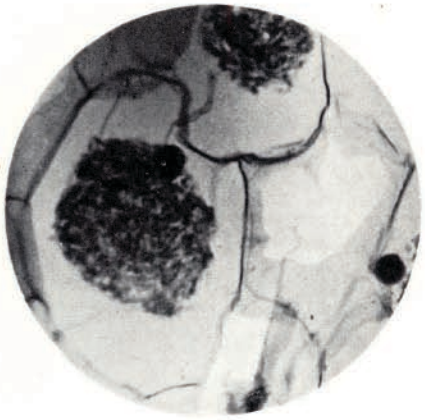

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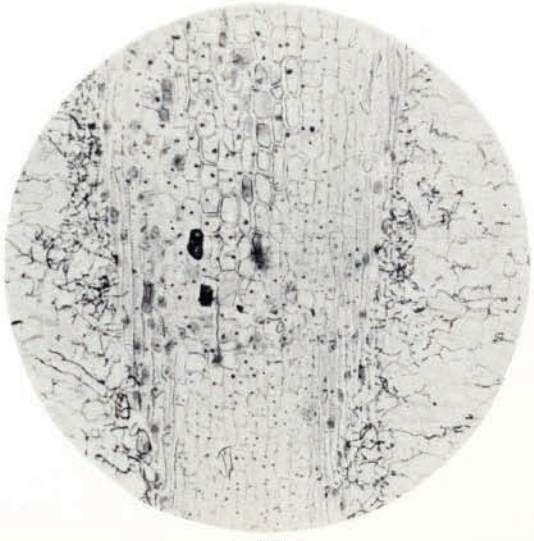

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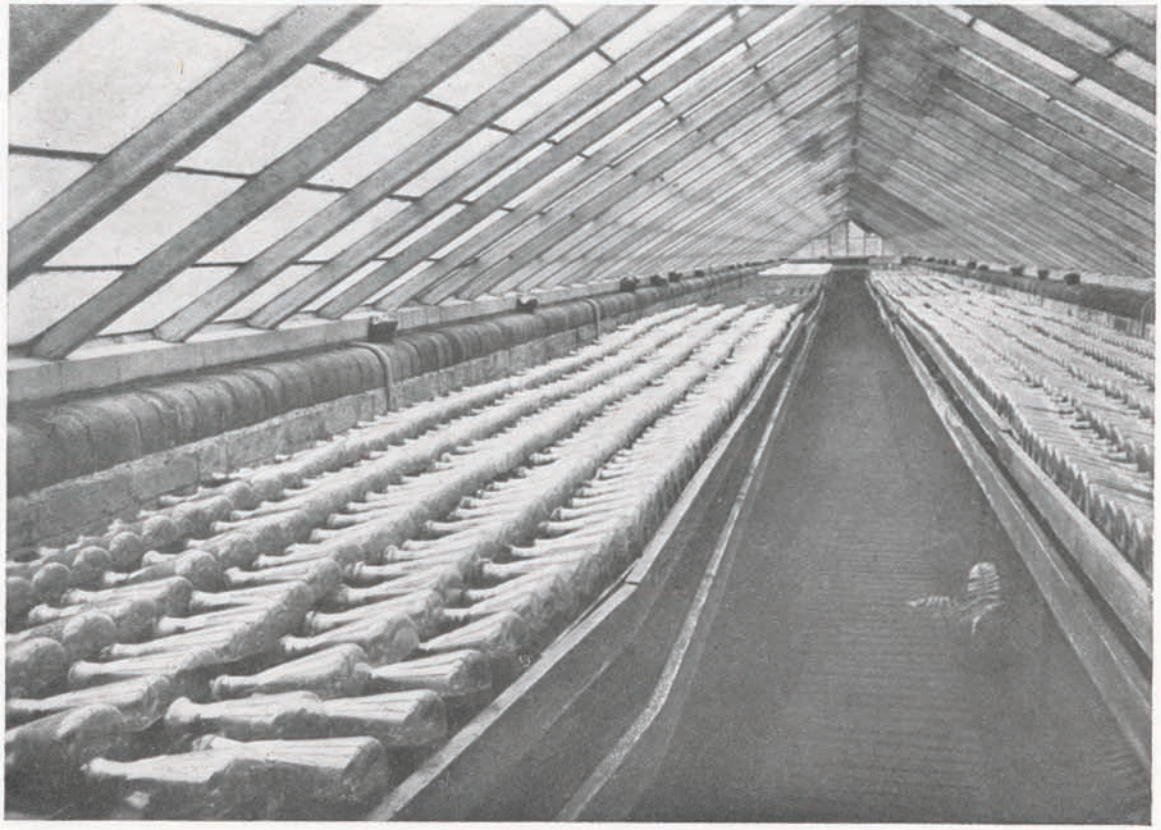

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INDEX TO PLANTS.

INDEX OF ILLUSTRATIONS.

NOTA BENE.

Our reputation for supplying sound progressive plants being world wide, we have taken the liberty of abbreviating the description of individual plants in this Catalogue to save space and unnecessary repetition.

At the heading of each Genus or Section, we state the average number of bulbs or growths with leads, which will apply throughout, unless otherwise given for special varieties, etc.

Where **F.C.C.** or **A.M.** is attached, the plant quoted is the original certificated variety, or a division of the same.

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12	,, Mossiæ	(*B. Digbyana*×*C. Mossiæ*)	1 1 0
13	,, Mossiæ **Queen Alexandra**	(*C. Mossiæ Wageneri*×*B. Digbyana*)	2 2 0
14	,, Schroderæ	(*B. Digbyana*×*C. Schroderæ*)	2 2 0
15	,, Trianæ	(*B. Digbyana*×*C. Trianæ*)	1 1 0
16	,, Warneri	(*B. Digbyana*×*C. Warneri*)	1 1 0
17	Empress	(*B. C. Digbyano-Mendelii*×*C. Schroderæ alba*)	2 2 0
18	Fascinator	(*B. C. Digbyano-Mendelii*×*C. Enid*)	3 3 0
19	heatonensis	(*B. Digbyana*×*C. Hardyana*)	1 1 0
20	Imperialis	(*B. C. Cliftonii*×*C. Mossiæ*)	4 4 0
21	Irene	(*B. C. Digbyano-Warneri*×*C. Mossiæ*)	2 2 0
22	Lady Jellicoe	(*B. C. Digbyano-Schroderæ*×*C. Gaskelliana albens*)	3 3 0
23	Lord Kitchener	(*B. C. Thorntonii*×*C. Mossiæ*)	3 3 0
24	Luegmann	(*C. Luegeæ*×*B. C. Mrs. J. Leemann*)	3 3 0
25	Madame Charles Maron	(*B. Digbyana*×*C. Warscewiczii*)	1 1 0
26	,, ,, ,, **gigantea**		3 3 0
27	Madeline	(*B. C. Madame Charles Maron*×*C. Trianæ*)	2 2 0
28	Marguerite Fournier	(*B. Digbyana*×*C. labiata*)	1 1 0
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33	Moira	(*B. C. Digbyano-Warneri×C. Gaskelliana*)	1 11 6
34	Moneta	(*B. C. Madame Charles Maron×C. Gaskelliana*)	1 11 6
35	Mrs. J. Leemann	(*B. Digbyana×C. Dowiana aurea*)	2 2 0
36	Mrs. Pitt	(*B. C. Digbyano-Warneri×C. labiata*)	1 11 6
37	Nestor	(*B. C. Madame Charles Maron×C. labiata*)	1 1 0
38	Olympus	(*B. C. Madame Charles Maron×C. Hardyana*)	3 3 0
39	Orion	(*B.C. Mrs. J. Leemann×C. Enid*)	3 3 0
40	Pallas	(*B.C. Digbyano-Mossiæ×C. Warscewiczii*)	3 3 0
41	Penelope	(*B. C. Madame Charles Maron×C. Fabia*)	2 2 0
42	Princess Elizabeth	(*B. C. Digbyano-Mendelii×C. Mossiæ*)	3 3 0
43	,, Patricia	(*C. Enid×B. C. Cliftonii magnifica*)	10 10 0
44	Queen of California	(*B. C. Madame Charles Maron×C. Warneri*)	2 2 0
45	Rosita	(*B. C. Ilene×C. Dowiana aurea*)	2 2 0
46	Rutherfordii	(*C. Gaskelliana alba×B. C. Digbyano-Mossiæ Queen Alexandra*)	2 2 0
47	Shillii	(*B. C. Digbyano-Mossiæ×C. Mossiæ*)	2 2 0
48	Sofrano	(*B. C. Mrs. J. Leemann×C. iridescens*)	3 3 0
49	speciosa	(*B. C. Digbyano-Mendelii×C. Schroderæ*)	2 2 0
50	Sylvia	(*B. C. Digbyano-Trianæ×C. Trianæ*)	1 11 6
51	Thorntonii	(*C. Gaskelliana×B. Digbyana*)	1 1 0
52	Vanessa	(*B. C. Digbyano-Warneri×C. Trianæ*)	2 2 0
53	Vilmoriniana	(*B. C. Mrs. J. Leemann×C. Mossiæ*)	5 5 0
54	,, **Centaur**	A gigantic flower with a magnificently coloured lip.	7 7 0
55	,, **magnifica**	For size and colour, one of the very best.	10 10 0
56	Virgo	(*B. cucullata×C. Mossiæ Wageneri*)	1 1 0

BRASSOLÆLIA.

57	Billintonii	(*B. Digbyana×B. L. Mrs. Gratrix*)	1 1 0
58	Digbyano-purpurata	(*B. Digbyana×L. purpurata*)	1 1 0
59	,, ,,	**King Edward VII.**	5 5 0
60	,, ,,	**The Mikado** (*B. Digbyana×L. purpurata fastuosa*)	3 3 0
61	,, ,,	**The Queen**	3 3 0
62	,, ,,	**White Lady** (*B. Digbyana×L. purpurata alba*)	5 5 0
63	Helen	(*B. Digbyana×L. tenebrosa*)	2 2 0
64	Jessopii	(*B. Digbyana×L. xanthina*)	1 1 0
65	Moonbeam	(*B. L. Jessopii×L. Dayana*)	1 1 0

BRASSOLÆLIA.

Nos.			Each. £ s. d.
66	Mrs. M. Gratrix	(*B. Digbyana*×*L. cinnabarina*)	2 2 0
67	Rolfei	(*B. Digbyana*×*L. crispa*)	1 1 0
68	Rosslyn	(*B. Digbyana*×*L. Latona*)	1 1 0
69	Suessa	(*B. Digbyana*×*L. cinnabrosa*)	1 1 0

BRASSOLÆLIOCATTLEYA.

70	Admiral Sims	(*B. C. Digbyano-Mossiæ*×*L. C. St. Gothard*)	3 3 0
71	Adonis	(*B. Digbyana*×*L. C. Canhamiana Rosslyn variety*)	1 1 0
72	Agamedes	(*C. labiata*×*B. L. Mrs. M. Gratrix*)	1 1 0
73	Ajax	(*B. C. Digbyano-Mossiæ*×*L. C. Aphrodite*)	5 5 0
74	Albatross	(*B. L. Digbyano-purpurata*×*C. Mossiæ*)	1 1 0
75	amabilis	(*B. L. Helen*×*L. C. Martinetti*)	1 1 0
76	Arderniæ	(*B. Digbyana*×*L. C. callistoglossa*)	1 1 0
77	beardwoodensis	(*B. Digbyana*×*L. C. C. G. Roebling*)	1 1 0
78	Camada	(*L. C. Artemis*×*B. C. Mrs. J. Leemann*)	1 1 0
79	Cooksonii	(*B. L. Mrs. M. Gratrix*×*C. Dowiana aurea*)	3 3 0
80	,, **Fine yellow variety**		7 7 0
81	Doris	(*B. C. Digbyano-Mossiæ*×*L. C. Fascinator*)	1 1 0
82	Endymion	(*B. L. Digbyano-purpurata*×*C. Warneri*)	1 1 0
83	Everest	(*B. C. Mrs. Leemann*×*L. C. Canhamiana*)	2 2 0
84	Furstenbergii	(*C. Trianæ*×*B. L. Mrs. M. Gratrix*)	1 11 6
85	Gerald	(*B. L. Digbyano-purpurata*×*L. C. bletchleyensis*)	1 1 0
86	Golden Crown **A fine yellow hybrid**	(*B. L. C. Joan*×*C. Venus*)	5 5 0
87	Gordon Highlander	(*B. C. Mrs. J. Leemann*×*L. C. Aphrodite*)	3 3 0
88	Hilda	(*B. L. Digbyano-purpurata*×*C. labiata*)	1 1 0
89	Ivernia	(*B. C. Thorntonii*×*L. C. Canhamiana Lady Wigan*)	3 3 0
90	Jean	(*B. C. Digbyano-Mossiæ*×*L. C. Gottoiana*)	1 11 6
91	Joan	(*B. L. Mrs. M. Gratrix*×*C. Octave Doin*)	2 2 0
92	,, **Excelsior. A.M. R.H.S.** A fine large flower. Sepals, petals and throat a rich Indian yellow, lip beautifully fringed, of a light apricot slightly shaded with pale mauve. 3 bulbs, all leaved, 1 lead		36 15 0
93	,, **Yellow Variety.** An all yellow flower, no colour on lip		10 10 0
94	Joiceyii	(*B. L. C. Cooksonii*×*C. Venus*)	5 5 0
95	,, **Fine yellow variety.** One of the finest yellows in the Cattleya section		10 10 0
96	King Emperor **F.C.C. R.H.S.** (*B. L. Digbyano-Mossiæ*×*L. C. callistoglossa*). A gigantic flower with a rich crimson purple lip		35 0 0
97	Latefa	(*L. C. Fascinator*×*B. L. Suessa*)	1 1 0

BRASSOLÆLIOCATTLEYA.

Nos.			Each. £ s. d.
98	Lilian	(*C. Iris* × *B. L. Cooksonii*)	1 1 0
99	Lutetia	(*L. C. highburyensis* × *B. C. Mrs. J. Leemann*)	1 1 0
100	Mackayi	(*L. C. elegans Turneri* × *B. Digbyana*)	1 1 0
101	Muriel	(*B. C. Madame C. Maron* × *L. C. Feronia*)	2 2 0
102	Nesta	(*B. C. Digbyano-Mossiæ* × *L. C. Ingramii*)	1 1 0
103	Prince of Wales	(*B. C. Digbyano-Mossiæ* × *L. C. Dominiana*)	5 5 0
104	Queen of the Belgians	(*B. L. Digbyano-purpurata* × *C. Mendelii*)	2 2 0
105	Risdene	(*B. L. C. Veitchii* × *L. C. Gottoiana*)	5 5 0
106	Sylvia	(*B. L. Digbyano-purpurata* × *C. Eldorado*)	1 1 0
107	Thera	(*L. C. G. S. Ball* × *B. Digbyana*)	1 1 0
108	Thompsonii	(*B. L. Digbyano-purpurata* × *C. Gaskelliana*)	1 1 0
109	„ alba	(*B. L. Digbyano-purpurata* × *C. Gaskelliana alba*)	3 3 0
110	Thyone	(*L. C. Thyone* × *B. C. Mrs. J. Leemann*)	3 3 0
111	Tonie.	(*B. L. C. Cooksonii* × *C. Venus*) A magnificent Buttercup-yellow flower	10 10 0
112	Truffautiana	(*B. C. Mrs. J. Leemann* × *L. C. luminosa*)	5 5 0
113	Tucuman	(*B. L. C. Cooksonii* × *C. Rhoda*)	5 5 0
114	„ **Ramadie**	A fine yellow flower of good size and substance	7 7 0
115	Veitchii	(*L. purpurata* × *B. C. Digbyano-Mossiæ*)	2 2 0
116	Winnifred	(*B. L. Mrs. M. Gratrix* × *L. C. Myra*)	1 1 0
117	Wotan	(*B. C. Mrs. J. Leemann* × *L. C. callistoglossa*)	2 2 0

CATTLEYA SPECIES.

118	Aclandiæ		1 1 0
119	Bowringiana		15 0
120	„	Magnificent specimen, having 25 bulbs, well leaved, 5 of which are of fine leads	5 5 0
121	chocoensis alba, **Wellesley's var.**		5 5 0
122	„ „ **Wigan's var.**		3 3 0
123	dolosa		1 1 0
124	Dowiana		1 1 0
125	„ **aurea**		1 1 0
126	„ **Rosita**		10 10 0
127	Gaskelliana		7 6
128	„ **alba**		3 3 0
129	„ „ **Mdme. Chas. Madoux**		7 7 0
130	„ „ **Wigan's var.**		5 5 0
131	„ **Duc de Mortemart.**	A very rich mauve variety	7 7 0

gigas (see Warscewiczii).

CATTLEYA SPECIES.

Nos.			Each. £ s. d.
132	granulosa,	**Schofieldiana aurea.** A grand variety (rare)	10 10 0
133	Harrisoniæ	**alba**	3 3 0
134	intermedia	.. ..	10 6
135	,,	**Acquinii.** A distinct variety having petals prettily tipped with crimson, same as lip	10 10 0
136	,,	**alba**	1 1 0
137	labiata	.. ..	10 6
138	,,	**alba variety**	5 5 0
139	,,	**alba Charlesworthii**	7 7 0
140	,,	**Gilmouriæ**	21 0 0
141	,,	**Penelope**	10 10 0
142	,,	**Reedleyensis**	7 7 0
143	,,	**Schofieldiana**	21 0 0
144	,,	**The Emperor**	15 15 0
145	Lawrenceana,	**Mary Regina.** The rarest Cattleya in cultivation. Petals and sepals pure white, lip white with a slight flush of colour on front lobe. This plant was awarded the Special Silver Cup for the best Cattleya species exhibited at the Chelsea Show, 1913. Fine healthy plant with 4 bulbs, 1 of which is a lead. Price on application.	
146	Lawrenceana,	**West Bank House variety.** A fine dark variety	3 3 0
147	Lueddemanniana	**alba**	5 5 0
148	,,	**leodiensis.** A rich mauve variety	5 5 0
149	Mendelii	.. ..	10 6
150	,,	**alba.** A pure white variety. Flowers of very fine shape and texture. Good plant with 5 bulbs	20 0 0
151	,,	**albo aurea.** A very pleasing variety with white petals, sepals and lip. Orange yellow throat	15 15 0
152	,,	**distinct purple variety.** Nice plant with 5 bulbs, 1 lead	5 5 0
153	,,	**Fairy.** Almost white sepals and petals, lip coloured. Very pretty variety. Nice plant with 5 bulbs, 1 lead	10 10 0
154	,,	**Fine variety.**	5 5 0
155	,,	**illustris.** A richly coloured variety with size and substance	10 10 0
156	,,	**leucochila.** A distinct variety. Petals and sepals blush white, lip pure white with a yellow throat. Very fine plant having 5 bulbs, 1 lead	10 10 0
157	,,	**Mrs. R. F. Felton.** One of the very best of the coloured varieties, flowers magnificently built and of great substance. For hybridizing purposes a most desirable Cattleya	36 15 0
158	,,	**Prince Fushima.** A very handsome variety. Fine shape and substance, petals and sepals rich rose, lip deep magenta and beautifully frilled. Splendid plant, having 4 bulbs, 1 lead	21 0 0
159	,,	**Princess Juliannæ.** A richly coloured flower of fine shape and substance, sepals and petals a deep rich rose, with large frilled magenta lip. Fine plant of 4 bulbs, 1 lead	21 0 0

CATTLEYA SPECIES.

Nos.			Each. £ s. d.
160	Mendelii,	**Queen of Spain.** A very pleasing variety. Flowers large, petals and sepals white, and lip rich magenta. Good plant with 5 bulbs, 1 lead	15 15 0
161	,,	**The Queen.** A delicately beautiful variety, having blush white petals, sepals and lip. Splendid plant with 7 bulbs	26 5 0
162	Mossiæ	.. ..	10 6
163	,,	**alba**	7 7 0
164	,,	**aurantiaca superba**	7 7 0
165	,,	**aurea**	5 5 0
166	,,	**distinct variety**	5 5 0
167	,,	**Gargantua**	5 5 0
168	,,	**gloriosa**	7 7 0
169	,,	**Hardyana.** An old, but still a very distinct variety. Petals and sepals distinctly mottled and flaked with deep mauve, lip and throat a rich orange yellow. Very fine plant having 5 bulbs, 1 lead	7 7 0
170	,,	**imperialis**	3 3 0
171	,,	,, **liniator**	5 5 0
172	,,	**incarnata superba**	7 7 0
173	,,	**Olympia. A.M. R.H.S.** A grand Mossiæ. Fine shape, size and substance. Petals very broad with splendid shoulders, sepals extra broad and fine, lip very large, trumpet-shaped, and beautifully frilled. Strong plant with 5 bulbs, 1 lead	31 10 0
174	,,	**Reineckiana**	3 3 0
175	,,	,, **Vigeriana**	7 7 0
176	,,	**superba**	3 3 0
177	,,	**The Bride**	10 10 0
178	,,	**variabilis**	5 5 0
179	,,	**Wageneri**	3 3 0
180	,,	,, **Fine variety**	4 4 0
181	,,	,, **Chavagnac's variety**	5 5 0
182	,,	,, **Mdme. Cahuzac**	7 7 0
183	,,	,, **magnifica. King Edward VII.** The finest Wageneri in cultivation. Handsome large shaped flower, having a beautiful yellow throat. Nice plant with 4 bulbs	21 0 0
184	,,	,, **Silvana.** Fine plant with 5 bulbs, 1 lead	15 15 0
185	,,	,, **Silver Queen. A.M. R.H.S.** Nice plant with 5 bulbs ..	21 0 0
186	O'Brieniana alba	.. ..	3 3 0
187	Percivaliana	.. ..	1 1 0
188	,,	**alba**	10 10 0
189	,,	,, **Charlesworth's var. F.C.C. R.H.S.** One of the very finest of the white varieties. Flowers large and of good shape. Petals and sepals white, lip rich crimson with white margin. Good plant with 7 bulbs, 1 lead	31 10 0
190	,,	,, **Little Gem.** A small, but beautifully shaped variety	5 5 0
191	Schilleriana	.. ..	1 1 0

CATTLEYA SPECIES.

Nos.		Each. £ s. d.
192	Schroderæ	10 6
193	,, **alba**	3 3 0
194	,, ,, **Ohlendorf's variety**	7 7 0
195	,, ,, **special variety.** Fine flower with distinct yellow throat	10 10 0
196	,, ,, **heatonensis.** A distinct variety. Good shaped flower of a pale lilac colour, lip and throat primrose yellow	10 10 0
197	,, **Ophir.** Fine plant with 4 bulbs, 1 lead	5 5 0
198	Skinneri	15 0
199	,, **alba**	3 3 0
200	,, **Temple's variety.** The well-known dark variety	3 3 0
201	Trianæ	10 6
202	,, **Admiral Beatty.** An exceptionally fine large and richly coloured flower. Very nice plant with 4 bulbs, 1 lead	36 15 0
203	**alba**	3 3 0
204	,, **floribunda**	2 2 0
205	,, ,, **Mrs. Sondheim.** A fine bold flower, pure white variety	10 10 0
206	,, ,, **Well's variety**	7 7 0
207	,, **albida**	2 2 0
208	,, **Backhouseana.** The variety having petals tipped with rich crimson	5 5 0
209	,, **Britannia.** A splendid variety, perfect in shape and substance. Fine plant having 5 bulbs, well leaved, 1 lead	26 5 0
210	,, **distinct variety**	3 3 0
211	,, **Edgar Knight.** One of the best of the Backhouseana section. Good plant having 5 bulbs, well leaved, 1 lead	10 10 0
212	,, **Grand Monarch.** The best and finest Trianæ in cultivation. Magnificent plant with 4 bulbs, 1 lead	50 0 0
213	,, **Lord Kitchener.** A magnificent variety. Splendid plant with 5 bulbs	36 15 0
214	,, **Roebling's variety.** A beautiful variety, not large, but fine in shape colour and substance of flowers. Good plant with 5 bulbs, 1 lead	40 0 0
215	,, **Shorteri.** A very compact and well-shaped flower. Good coloured petals and sepals, lip trumpet shaped and richly coloured. Nice plant with 4 bulbs	7 7 0
216	,, **The Baroness.** A magnificent variety of Trianæ, excellent in every way for size, shape and substance. Fine plant with 3 bulbs	52 10 0
217	,, **Baron Ijuin.** A very pleasing variety, with specially dark lip	10 10 0
218	Warscewiczii	10 6
219	,, **majestica.** Extra fine variety for size, shape and substance	42 0 0
220	,, **Mrs. E. Ashworth. F.C.C. R.H.S.** A very distinct and pleasing variety, of a uniform blush white tint, with pure rose frecklings on lip. Splendid plant with 5 bulbs, 1 lead	26 5 0
221	,, **Richard Ashworth.** A pleasing blush white variety	10 10 0
222	Warneri **alba.** The finest variety. Grand plant with 5 bulbs, 1 lead	21 0 0
223	,, **Ardenholme var.** The darkest and best coloured Warneri known to cultivation	26 5 0

CATTLEYA HYBRIDS.

Nos.			Each. £ s. d.
224	Abekeniæ	(*Dowiana Rosita* × *Lord Rothschild*)	2 2 0
245	Adula	(*bicolor* × *Hardyana*)	3 3 0
226	Æneas	(*Venus* × *Dowiana aurea*)	3 3 0
227	„ **Fine variety.** A pretty lemon yellow flower		5 5 0
228	Alcimeda	(*Gaskelliana alba* × *labiata alba*)	2 2 0
229	Aliciæ	(*Iris* × *labiata*)	3 3 0
230	Almata	(*F. W. Wigan* × *labiata*)	2 2 0
231	amabilis	(*labiata autumnalis* × *Warscewiczii*)	2 2 0
232	Andreana	(*Dowiana* × *Mrs. Pitt*)	2 2 0
233	Antiope	(*Chamberlainianum* × *Dowiana aurea*)	3 3 0
234	Arestor	(*labiata* × *Nestor*)	1 11 6
235	Ariel	(*Bowringiana* × *Gaskelliana*)	10 6
236	armainvillierense	(*Mendelii* × *Warscewiczii*)	2 2 0
237	Armstrongiæ	(*Hardyana* × *Loddigesii*)	10 6
238	Artemis	(*Gaskelliana* × *Iris*)	1 11 6
239	Barbara	(*Bowringiana* × *Trianæ*)	15 0
240	Basil	(*Enid* × *Mantinii*)	2 2 0
241	Bellona	(*Dowiana aurea* × *Maggie Raphael*)	1 11 6
242	„ **alba**	(*Dowiana aurea* × *Maggie Raphael alba*)	3 3 0
243	Blackii	(*Gaskelliana* × *Mendelii*)	15 0
244	„ **alba**	(*Gaskelliana alba* × *Mendelii alba*)	3 3 0
245	Boadicea	(*Gaskelliana* × *Hardyana*)	3 3 0
246	Cerebus	(*intertexta Juliettæ* × *labiata alba*)	3 3 0
247	„ **Fine variety.** A fine bold white flower		5 5 0
248	Charlesworthii	(*Bowringiana* × *superba*)	2 2 0
249	Clotho	(*Enid* × *Trianæ*)	1 11 6
250	„ **Fine variety.** A fine Cattleya, from a cross which has proved exceptionally good		5 5 0
251	Cowaniæ alba	(*Mossiæ Wageneri* × *intertexta Juliettæ*)	3 3 0
252	„ „ **Fine variety.** A splendid flower of one of the very best albino hybrids yet raised		5 5 0
253	Desdemona	(*Fabia* × *Thurgoodiana*)	2 2 0
254	Diana	(*Dowiana* × *Sybil*)	1 11 6
255	Dionysius	(*Fabia* × *Warscewiczii*)	1 11 6
256	„ **Fine variety.** A beautiful flower favouring the Fabia parent in colour, with the yellow throat of a good Warscewiczii		4 4 0
257	Dupreana	(*Warneri* × *Warscewiczii*)	2 2 0
258	„ **Fine variety.** For size, shape and colour, all that is to be desired		5 5 0
259	Dusseldorffei, var.: **Undine**	(*intermedia alba* × *Mossiæ Wageneri*)	1 11 6
260	Elaine	(*Hardyana* × *Mrs. Pitt*)	1 11 6
261	Elvina	(*Schilleriana* × *Trianæ*)	1 1 0
262	Empress Frederick	(*Dowiana* × *Mossiæ*)	2 2 0

CATTLEYA HYBRIDS.

Nos.		Each. £ s. d.
263	Empress Frederick, **distinct variety**. An old hybrid, but still good	4 4 0
264	Enid .. .. (*Mossiæ×Warscewiczii*) ..	15 0
265	,, **alba**. A very pleasing albino with nicely coloured lip...	2 2 0
266	,, ,, **Fine variety**	4 4 0
267	,, ,, **Good variety**	3 3 0
268	,, ,, **magnifica.** Excellent in size, shape and substance	5 5 0
269	Eva .. .. (*Fabia alba×Countess of Derby*) ..	1 11 6
270	Fabia .. .. (*Dowiana×labiata*) ..	1 1 0
271	,, **alba**	3 3 0
272	,, **albens**	2 2 0
273	,, **Fine variety.** A very richly coloured flower	5 5 0
274	Fauna .. .. (*Chamberlainiana×Hardyana*) ..	2 2 0
275	Fernand Denis.. .. .. (*Aclandiæ×Warscewiczii*) ..	2 2 0
276	F. W. Wigan .. .. (*Dowiana×Schilleriana*) ..	1 11 6
277	General Pulteney .. .. (*Octave Doin×Trianæ*) ..	2 2 0
278	Germania **magnifica. A.M. R.H.S.** .. .. (*granulosa×Hardyana*) ..	5 5 0
279	Golden King .. .. (*Hardyana×Venus*) ..	3 3 0
280	,, ,, **Fine variety**. Rich golden coloured petals and sepals, dark crimson lip	7 7 0
281	Hardyana .. .. (*Dowiana×Warscewiczii*) ..	1 11 6
282	,, **alba.** Acknowledged as one of the boldest and largest of the albino section	3 3 0
283	,, ,, **Fine variety**	5 5 0
284	,, **Good variety**	3 3 0
285	Harold .. .. (*Gaskelliana×Warscewiczii*) ..	15 0
286	,, **Fine variety**	3 3 0
287	Hentschelii .. .. (*Warscewiczii×Dupreana*) ..	2 2 0
288	,, **Fine variety.** A magnificently shaped Cattleya, of a rich dark colour	5 5 0
289	Hesta .. .. (*Suzanne Hye de Crom×Warscewiczii Frau Melanie Beyrodt*) ..	1 11 6
290	,, **Fine variety.** A distinctly pleasing albino with a rich crimson lip	4 4 0
291	Hybla .. .. (*Iris×Trianæ*) ..	2 2 0
292	,, **Mrs. Frank Hurndell**	3 3 0
293	intertexta .. .. (*Mossiæ×Warneri*) ..	1 1 0
294	,, **Juliettiæ** .. .. .. (*Mossiæ Wageneri×Warneri alba*) ..	3 3 0
295	,, ,, **Fine variety.** One of the largest of the albinos, without colour on lip	7 7 0
296	Irene .. .. (*Mossiæ Wageneri×Suzanne Hye de Crom*) ..	4 4 0
297	Iris .. .. (*bicolor×Dowiana*) ..	1 11 6
298	,, **King Edward VII. F.C.C. R.H.S.** This is undoubtedly one of the finest vars. of C. Iris in cultivation. Good plant with 4 bulbs, 1 of which is a lead	15 15 0
299	Jasper .. .. (*Venus×Octave Doin*) ..	2 2 0

CATTLEYA HYBRIDS.

Nos.		Each. £ s. d
300	Jocasta .. ..(*Mossiæ×Schroderæ*) ..	15 0
301	Kitty Wren .. .. (*Gaskelliana×Fabia*) ..	1 11 6
302	,, ,, **Good variety**	3 3 0
303	Lord Rothschild .. .. (*Gaskelliana×Dowiana aurea*) ..	2 2 0
304	,, ,, **alba.** .. .. .. (*Gaskelliana alba×Dowiana aurea*) A fine bold flower having white sepals and petals, with coloured lip	3 3 0
305	,, ,, **albens**	2 2 0
306	Luegeæ .. .. (*Dowiana Rosita×Enid*) ..	2 2 0
307	,, **Fine variety**	4 4 0
308	Mabel .. .. (*Mrs. Myra Peeters×Warneri alba*) ..	3 3 0
309	,, **Fine variety.** A bold white flower with a pleasing lemon yellow throat ..	5 5 0
310	Maggie Raphael .. .. (*Dowiana×Trianæ*) ..	1 11 6
311	,, ,, **alba** .. .. .. (*Dowiana aurea×Trianæ alba*) ..	2 2 0
312	,, ,, ,, **Fine variety.** A nice white Cattleya with a little colour on lip	3 3 0
313	Mantinii .. .. (*Bowringiana×Dowiana*) ..	15 0
314	,, **Good variety**	2 2 0
315	,, **nobilior**	3 3 0
316	Merope .. .. (*Fabia×Trianæ*) ..	1 1 0
317	Miguelito .. .. (*Octave Doin×Dowiana aurea*) ..	1 11 6
318	,, **Good variety**	3 3 0
319	Mira .. .. (*Rhoda×Dowiana aurea*) ..	3 3 0
320	Monarch .. .. .. (*Empress Frederick×Trianæ Grand Monarch*) ..	2 2 0
321	,, **Fine variety**	4 4 0
322	Mrs. Myra Peeters .. .. .. (*Gaskelliana alba×Warneri alba*) ..	2 2 0
323	,, ,, ,, **Fine variety.** A pure white albino	3 3 0
324	Mrs. Pitt .. .. (*Dowiana×Harrisoniæ*) ..	1 1 0
325	,, ,, **Fine variety**	3 3 0
326	Muriel .. .. (*Dusseldorfei Undine×Mendelii alba*) ..	2 2 0
327	Nagoya .. .. (*Warscewiczii Imperator×Elvina*) ..	1 1 0
328	Naidia .. .. (*iridescens×Hardyana*) ..	2 2 0
329	Nortia .. .. (*Enid×Miss Harris*) ..	1 11 6
330	Octave Doin .. .. (*Dowiana×Mendelii*) ..	1 11 6
331	,, ,, **Good variety**	3 3 0
332	Peetersii .. .. (*labiata×Hardyana*) ..	1 1 0
333	Phrygia .. .. (*Enid×Portia*) ..	1 1 0
334	Pittiana .. .. (*Dowiana×granulosa*) ..	2 2 0
335	Portia .. .. (*Bowringiana×labiata*) ..	15 0
336	,, **Good variety**	2 2 0
337	,, **superba**	3 3 0
338	President Wilson .. .. (*Fabia×labiata*) ..	10 6

CATTLEYA HYBRIDS.

Nos.		Each. £ s. d.
339	President Wilson. **Good variety.** A good coloured Cattleya	2 2 0
340	Princess Royal (*Fabia×Hardyana*)	1 11 6
341	,, ,, **Good variety**	3 3 0
342	,, ,, **A.M. R.H.S.** Exceedingly fine shape and colour	10 10 0
343	Purity (*labiata alba×Warneri alba*)	4 4 0
344	Rhoda (*Hardyana×Iris*)	2 2 0
345	,, **Fine variety.** A distinct and beautiful hybrid	5 5 0
346	Robert de Wavrin (*Schilleriana×Schroderæ*)	2 2 0
347	Sibyl (*Dowiana×iridescens*)	1 11 6
348	Sirius (*Germania×Trianæ*)	2 2 0
349	Soramis (*Mendelii×Empress Frederick*)	1 11 6
350	Stuartii (*Mendelii×Mossiæ*)	15 0
351	,, **virginale** (*Mendelii alba×Mossiæ Wageneri*)	3 3 0
352	Suzanne Hye de Crom (*Gaskelliana alba×Mossiæ Wagneri*)	2 2 0
353	,, ,, ,, **Fine variety.** A beautiful albino with a yellow throat	5 5 0
354	Sylvia (*Dowiana×Fabia*)	1 11 6
355	Syros (*Enid×labiata*)	1 1 0
356	,, **Good variety**	2 2 0
357	Thebes (*Adula×Dowiana Rosita*)	1 11 6
358	Thora (*Mrs. Pitt×Empress Frederick*)	2 2 0
359	,, **Good variety**	5 5 0
360	,, **Electra.** A wonderful hybrid, the colouring of the flower improving each day as it grows, and ultimately developing into a marvellous shade of rich rose	26 5 0
361	Tityus. (*Enid×Octave Doin*) One of the finest Cattleya hybrids raised	2 2 0
362	,, **Fine variety**	7 7 0
363	,, **Good variety**	4 4 0
364	Trevella (*Mendelii alba×Suzanne Hye de Crom*)	2 2 0
365	,, **Fine variety.** A very pleasing albino	5 5 0
366	Troilus (*Luegeæ×Clotho*)	5 5 0
367	,, **A.M. variety. R.H.S.** A handsome Cattleya, having finely developed deep mauve sepals and petals, with showy crimped violet purple lip. Good plant with 3 bulbs, all leaved, and a strong lead	26 5 0
368	Vacuna (*labiata×Lord Rothschild*)	1 1 0
369	Venus (*Dowiana×Iris*)	3 3 0
370	,, **Good variety.** A good Cattleya of the yellow section	5 5 0
371	,, **Very fine variety.** Rich yellow sepals and petals, dark crimson lip	10 10 0
372	Victory (*Gaskelliana×Enid*)	1 1 0
373	Wellesleyæ (*Mantinii×Warscewiczii*)	1 11 6
374	Whitei (*Schilleriana×Warneri*)	1 1 0
375	Ypres (*Fabia alba×Mrs. Pitt*)	2 2 0
376	Zephyr (*Dowiana×Schroderæ*)	2 12 6

CYMBIDIUM.

SOUND HEALTHY PLANTS WITH SEVERAL BULBS, WELL LEAVED, AND ONE OR TWO GOOD LEADS.

Nos.			Each. £ s. d.
377	Alexanderi	(*insigne*×*eburneo-Lowianum*)	1 11 6
378	devonianum		2 2 0
379	Doris	(*Tracyanum*×*insigne*)	1 1 0
380	eburneo-Lowianum	(*eburneum*×*Lowianum*)	1 1 0
381	,, ,, **concolor**	(*eburneum*×*Lowianum concolor*)	2 2 0
382	eburneum		1 1 0
383	giganteum		10 6
384	Gottianum	(*eburneum*×*insigne*)	10 6
385	Holfordianum	(*eburneum*×*grandiflorum*)	1 11 6
386	Hookerianum		1 1 0
387	insigne		15 0
388	Lowianum		10 6
389	,, **concolor**		1 11 6
390	Pauwelsii	(*insigne*×*Lowianum*)	2 2 0
391	Schlegelii	(*Wiganianum*×*insigne*)	1 1 0
392	tigrinum		2 2 0
393	Tracyanum		10 6
394	,, **Fine variety**		1 1 0
395	Wiganianum	(*Tracyanum*×*eburneum*)	10 6

CYPRIPEDIUM SPECIES.

HEALTHY PLANTS WITH SEVERAL VIGOROUS GROWTHS.

396	callosum **delicatum**		10 6
397	,, **Sanderæ**		1 11 6
398	Chamberlainianum		2 2 0
399	Charlesworthii		10 6
400	,, **Bromilowæ.**	A very chaste and beautiful albino form. Dorsal sepal pure white with a small green area at the base, petals and lip pale green, staminode porcelain white. A nice healthy plant with 2 small growths	10 10 0
401	,, **Mrs. Le Doux**		2 2 0
402	Dayanum		1 1 0
403	Exul		10 6
404	glaucophyllum		10 6
405	Haynaldianum		1 1 0
406	hirsutissimum		10 6

CYPRIPEDIUM SPECIES.

Nos.		Each. £ s. d.
407	insigne	5 0
408	,, **Balliæ**	10 6
409	,, **Ernestii**	10 6
410	,, **Harefield Hall**	15 0
411	,, **Hessle variety**	10 6
412	,, **Sanderæ**	15 0
413	,, **Sanderianum**	1 1 0
414	,, **Youngianum**	10 6
415	Lawrenceanum	15 0
416	Lubbersianum	15 0
417	Mastersianum	1 1 0
418	Parishii	1 1 0
419	præstans	2 2 0
420	Rothschildianum	1 11 6
421	,, **Dulcote variety**	5 5 0
422	,, **Fine variety**	3 3 0
423	Spicerianum	10 6
424	,, **virescens**	1 1 0
425	superbiens	15 0
426	venustum	1 1 0
427	villosum **Prince of Orange**	1 1 0

CYPRIPEDIUM HYBRIDS.

HEALTHY PLANTS WITH SEVERAL VIGOROUS GROWTHS.

428	Actæus (*insigne*×*Leeanum*)	7 6
429	,, **Bianca Westonbirt var : F.C.C. R.H.S.** (*insigne Sanderæ*×*Leeanum Prospero*). A pleasing yellow flower with margin of white on upper dorsal	5 5 0
430	,, **Victor**	10 6
431	A. de Lairesse (*Curtisii*×*Rothschildianum*)	15 0
432	Adrianæ (*Hitchensiæ*×*Fairrieanum*)	10 6
433	Æson **giganteum** (*Druryi*×*insigne*)	3 3 0
434	,, **superbum**	10 6
435	Alcibiades (*Leeanum giganteum*×*Monsieur de Curte*)	7 6
436	,, **illustris.** A magnificent Cypripedium. Flowers very large and of fine substance. The large dorsal sepal is white, with an emerald green base and dotted lines of purple. Petals and lip yellow, tinged and marked with purple green	5 5 0

CYPRIPEDIUM HYBRIDS.

Nos.			Each. £ s. d.
437	Alcimeda	(*insigne Harefield Hall* × *Alcibiades*)	10 6
438	„ **Strelsa. A.M. R.H.S.**	One of the finest and boldest of the Harefield Hall section of hybrids	5 5 0
439	Amata	(*Minos Youngii* × *Mrs. Wm. Mostyn*)	10 6
440	Arthurianum	(*Fairrieanum* × *insigne*)	5 0
441	„ **pulchellum, Charlesworth's variety**		10 6
442	aureum **Hyeanum**	(*nitens* × *Spicerianum*)	1 1 0
443	„ **Golden Gem**		1 11 6
444	Baron Schroder	(*œnanthum superbum* × *Fairrieanum*)	5 0
445	„ „ **Fine variety**		1 1 0
446	beechense **superbum**	(*Curtisii* × *superbiens Demidoff's var.*)	10 6
447	Beeckmannii	(*supposed Boxallii* × *bellatulum*)	10 6
448	Bellona **superba**	(*villosum grandiflorum* × *Spicerianum magnificum*)	15 0
449	Benita	(*aureum virginale* × *Maudiæ*)	10 6
450	Boltonii	(*niveum* × *insigne Sanderæ*)	3 3 0
451	Buchanianum **magnificum**	(*Spicerianum* × *Druryi*)	10 6
452	Connie	(*glaucophyllum* × *Fairrieanum*)	7 6
453	Coreen	(*Flamingo* × *Earl of Tankerville*)	1 1 0
454	Cornelia	(*Fowleri* × *insigne Harefield Hall*)	10 6
455	Cramore	(*Gaston Bulteel* × *Dreadnought*)	2 2 0
456	Daisy Barclay	(*Godefroyæ leucochilum* × *Rothschildianum*)	3 3 0
457	Desdemona	(*Mrs. Cary Batten* × *Alcibiades*)	10 6
458	„ **Fine variety**		2 2 0
459	Dowleri	(*Godefroyæ leucochilum* × *insigne punctatum violaceum*)	1 1 0
460	„ **Hindeanum**	(*Godefroyæ leucochilum* × *insigne Harefield Hall var.*)	1 1 0
461	„ „ **Fine variety**		3 3 0
462	„ **Queen of Italy**	(*Godefroyæ leucochilum* × *insigne Sanderæ*)	1 1 0
463	Draco	(*insigne* × *Hera Euryades*)	10 6
464	„ **Fine variety**		2 2 0
465	„ **Lord Ivor**	(*insigne Harefield Hall* × *Hera Euryades*)	3 3 0
466	Earl of Tankerville	(*exul* × *nitens, Sander's variety*)	1 1 0
467	Edithæ	(*Chamberlainianum* × *bellatulum*)	1 1 0
468	Eurybiades **mirum**	(*Hera Euryades* × *Alcibiades superbum*)	2 2 0
469	„ „ **Fine variety**		5 5 0
470	euryandrum **superbum**	(*barbatum* × *Stonei*)	7 6
471	Evansianum	(*parentage unrecorded*)	10 6
472	Felicity. **A.M. variety**	(*tonsum* × *villosum*)	1 1 0
473	Fletcherianum	(*W. R. Lee, var : Lord Derby* × *Godefroyæ leucochilum*)	5 5 0
474	Forest King	(*Desdemona* × *Beeckmannii*)	5 5 0
475	„ „ **Fine variety.**	A flower of good shape and substance. The upper portion of the large dorsal is white, base pale green with purple spots, lip honey yellow shaded chocolate brown	21 0 0

CYPRIPEDIUM HYBRIDS.

Nos.			Each. £ s. d.
476	Fowlerianum. **Fine variety**	(*Harrisianum*×*bellatulum*)	1 1 0
477	Gaston Bulteel	(*parentage unrecorded*)	2 2 0
478	Germaine Opoix	(*Madame Coffinet*×*Fairrieanum*)	3 3 0
479	Godseffianum	(*Boxallii*×*hirsutissimum*)	10 6
480	Gowerianum	(*Lawrenceanum*×*Curtisii*)	5 0
481	„ **magnificum**		10 6
482	Harrisianum	(*villosum*×*barbatum*)	7 6
483	„ **superbum**		10 6
484	Helen II.	(*bellatulum*×*insigne*)	10 6
485	„ „ **Westonbirt variety. F.C.C. R.H.S.**	(*bellatulum*×*insigne Harefield Hall*)	1 1 0
486	Hera Euryades, **New Hall Hey var.**	(*Boxallii*×*Leeanum*)	10 6
487	„ „ **splendens**		1 1 0
488	Hermia	(*Standard*×*Fowlerianum*)	10 6
489	Hitchensiæ	(*insigne*×*Charlesworthii*)	7 6
490	„ **magnificum**		1 1 0
491	„ **Diabolo**		15 0
492	Honoriæ, **Fine variety**	(*Druryi*×*Godefroyæ leucochilum*)	1 11 6
493	Io maxima	(*Lawrenceanum*×*Argus Mœnsii*)	5 0
494	Iris II.	(*Chamberlainianum*×*Maudiæ*)	7 6
495	Ivanhoe	(*Gaston Bulteel*×*leyburnense*)	2 2 0
496	Izonso	(*Alcibiades*×*Mrs. Wm. Mostyn*)	10 6
497	„ **Fine variety**		1 1 0
498	J. H. Veitch	(*Curtisii*×*Stonei*)	1 1 0
499	Kimballiana	(*Dayanum*×*Rothschildianum*)	10 6
500	Lady Wimborne **magnificum**	(*villosum*×*Leeanum giganteum*)	1 1 0
501	Lathamianum **virginale**	(*Spicerianum*×*villosum*)	7 6
502	Leeanum **Adrian Lefebvre**	(*insigne*×*Spicerianum*)	2 2 0
503	„ **Charlesworth's variety**		10 6
504	„ **Corona**		1 11 6
505	„ **magnificum**		7 6
506	„ **Prospero majus**	(*insigne Sanderæ*×*Spicerianum*)	10 6
507	„ **superbissimum**	(*insigne*×*Spicerianum*)	10 6
508	leyburnense **magnificum**		2 2 0
509	loochristiense	(*Hookeræ*×*Harrisianum*)	5 0
510	Lord Ossulston, **Chillingham var.**	(*Leeanum giganteum*×*Charlesworthii album*)	2 2 0
511	„ „ **Crombleholme's var.**	A beautiful delicate variety	3 3 0
512	Lubbersii	(*barbatum*×*calophyllum*)	7 6
513	Lucilia	(*allertonense*×*Memnon*)	7 6
514	Madame Alfred Bleu	(*superbiens*×*Mrs. Fred Hardy*)	15 0
515	„ G. Truffaut	(*Stonei*×*ciliolare*)	7 6
516	Marica	(*aureum Surprise*×*insigne Sanderianum*)	1 1 0

CYPRIPEDIUM HYBRIDS.

Nos.			Each. £ s. d.
517	Massaianum	(*superciliare*×*Rothschildianum*)	10 6
518	Maudiæ	(*Lawrenceanum Hyeanum*×*callosum Sanderæ*)	1 1 0
519	„ **magnificum**		2 2 0
520	microchilum	(*niveum*×*Druryii*)	10 6
521	Milo	(*ænanthum superbum*×*insigne Chantinii*)	5 0
522	Minos, **Young's var:**	(*Spicerianum*×*Arthurianum*)	10 6
523	Morganiæ	(*superbiens*×*Stonei*)	10 6
524	Mrs. Cary Batten	(? × ?)	3 3 0
525	Muriel Hollington **Venus**	(*insigne Sanderæ*×*niveum*)	1 1 0
526	Niobe, **Westonbirt var.**	(*Spicerianum*×*Fairrieanum*)	7 6
527	Oberon	(*Fairrieanum*×*Hera Euryades*)	1 1 0
528	Olivia	(*tonsum*×*niveum*)	7 6
529	Pacavia	(*Evelyn Ames*×*Leeanum Clinkaberryanum*)	1 1 0
530	Pallas Athene. **F.C.C. R.H.S.** (*unrecorded parentage*). A magnificent flower, with a large dorsal sepal, the upper portion being white, shaded green towards the base, with dark purple spotting, changing to rose in the middle of white portion		7 7 0
531	Priam, **Charlesworth's var.**	(*Niobe*×*insigne Chantinii*)	1 1 0
532	Princess	(? ×*Monsieur Coffinet*)	10 6
533	Queen Mary	(*Æson giganteum*×*insigne Harefield Hall*)	10 6
534	Reginald Young	(*Hitchensiæ*×*insigne Harefield Hall*)	10 6
535	„ „ **Fine variety**		2 2 0
536	Rolfei	(*bellatulum*×*Rothschildianum*)	10 6
537	Rosita	(*callosum*×*Charlesworthii*)	7 6
538	Rossetti	(*insigne Sanderæ*×*Maudiæ*)	5 0
539	„ **Fine variety**		15 0
540	San-Actæus	(*insigne Sanderæ*×*Actæus*)	5 0
541	„ „ **Fine variety**		1 1 0
542	„ „ **Gerald Balfour**		2 2 0
543	Sir Redvers Buller	(*Smithii*×*insigne*)	7 6
544	Sunray	(*Charlesworthii*×*Leeanum Albertianum*)	5 0
545	Swinburnei **magnificum**	(*Argus Moensii*×*insigne Maulei*)	7 6
546	Thalia	(*insigne Chantinii*×*Baron Schroder*)	10 6
547	„ **giganteum**		1 11 6
548	„ **Mrs. Francis Wellesley**		2 2 0
549	Thea, **Fine variety**	(*Buchanianum*×*nitens G. S. Ball's var.*)	2 2 0
550	Thisbe	(*Fairrieanum*×*Cymatodes, beechense*)	10 6
551	Tigris	(*Mrs. Wm. Mostyn*×*Earl of Tankerville*)	1 1 0
552	triumphans	(*nitens Sallierii*×*ænanthum superbum*)	10 6
553	„ **Best variety**		1 1 0
554	Troilus	(*insigne Sanderæ*×*nitens Sallieri Hyeanum*)	15 0

CYPRIPEDIUM HYBRIDS.

Nos.		Each. £ s. d.
555	Troilus, **Cravenianum. A.M. R.H.S.** (*insigne Harefield Hall × nitens magnificum*). A fine bold Cypripedium, worthy of a place in the best collection	5 5 0
556	,, **Craven's variety. A.M. R.H.S.** (*insigne Harefield Hall × nitens Ball's variety*) ..	2 2 0
557	,, **eboraicum. F.C.C. R.H.S.** (*insigne Harefield Hall × nitens Ball's variety*) ..	4 4 0
558	Valens .. .. (*Fowlerianum × Fairrieanum*) ..	15 0
559	vexillarium .. .. (*barbatum × Fairrieanum*) ..	7 6
560	vill-Exul .. .. (*villosum × Exul*) ..	5 0
561	viridissimum .. .. (*aureum × villosum*) ..	7 6
562	woluwense .. .. (*niveum × Rothschildianum*) ..	10 6
563	Wottonii .. .. (*bellatulum × callosum*) ..	10 6
564	W. R. Lee, **Lord Derby** .. .. .. (*Rothschildianum × superbiens*) ..	1 1 0

LÆLIA.

HEALTHY PLANTS, HAVING 5 TO 7 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

565	acuminata	10 6
566	anceps	5 0
567	,, **alba**	1 1 0
568	,, ,, **Bull's variety**	1 11 6
569	,, ,, **Worthington's variety**	2 2 0
570	,, **Amesiana**	1 1 0
571	,, **Crawshayana**	1 1 0
572	,, **Dawsonii**	1 1 0
573	,, **grandiflora Chamberlainiana**	1 1 0
574	,, **Hardyana**	10 6
575	,, **Hillii**	1 1 0
576	,, **Hollidayana**	1 1 0
577	,, ,, **Crawshayana. F.C.C. variety**	3 3 0
578	,, ,, **rosefieldiensis**	2 2 0
579	,, **Sanderiana**	7 6
580	,, ,, **Fine variety**	1 1 0
581	,, **Schroderæ**	1 1 0
582	,, ,, **Crawshayana. F.C.C. variety**	2 2 0
583	,, ,, **Mrs. Francis Wellesley**	2 2 0
584	,, ,, **rosefieldiensis**	2 2 0
585	,, **Schroderiana**	1 1 0

LÆLIA.

Nos.		Each. £ s. d.
586	anceps, **Stella**	7 6
587	,, **Williamsiana**	10 6
588	,, ,, **virginale**	1 1 0
589	autumnalis	7 6
590	,, **alba**	1 1 0
591	Boothiana **alba (rare)**	7 7 0
592	Cowanii	10 6
593	Crashleyana	1 1 0
594	flava	1 1 0
595	Gouldiana	10 6
596	Jongheana **alba.** Nice plant of 4 bulbs, 1 lead	5 5 0
597	,, ,, **Nellie Blanche**	5 5 0
598	leucoptra	10 6
599	majalis **alba.** Good plant with 6 small bulbs	10 10 0
600	purpurata	10 6
601	,, **alba**	1 11 6
602	,, **Latona**	2 2 0
603	,, **Queen Alexandra.** Petals and sepals pure white, lip white with faintest trace of colour on front lobe. The purest albino form of the purpuratas	7 7 0
604	superbiens	1 1 0
605	tenebrosa	1 1 0
606	,, **Walton Grange variety.** "The yellow tenebrosa"	15 15 0

LÆLIA HYBRIDS.

607	bella	(*purpurata*×*majalis*)	3 3 0
608	Brisies	(*harpophylla*×*purpurata*)	10 6
609	Crawshayana	(*Natural hybrid*) (*albida*×*anceps*)	1 1 0
610	Finckeniana	(*Natural hybrid*) (*albida*×*anceps alba*)	1 11 6
611	Latona	(*cinnabarina*×*purpurata*)	1 1 0
612	Mozart	(*Boothiana*×*tenebrosa*)	1 1 0
613	Pacavia	(*purpurata*×*tenebrosa*)	1 1 0

LÆLIOCATTLEYA.

HEALTHY PLANTS, HAVING 5 TO 7 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

614	Adrienne	(*L. C. Juno*×*L. C. St. Gothard*)	2 2 0
615	Agnes	(*L. C. callistoglossa*×*L. C. Schilleriana*)	3 3 0

LÆLIOCATTLEYA.

Nos.		Each. £ s. d.
616	Alcippe .. .. (*C. Enid*×*L. C. Doris*) ..	1 11 6
617	amabilis .. .. (*L. C. Fascinator*×*C. Lueddemanniana*) ..	2 2 0
618	,, **Fascinator. A.M. R.H.S.**	10 10 0
619	Ancona .. .. (*C. Gaskelliana*×*L. C. Fascinator*) ..	15 0
620	Antigone .. .. (*C. Schilleriana*×*L. purpurata*) ..	1 1 0
621	Antimachus .. .. (*C. Warscewiczii*×*L. C. Dominiana*) ..	2 2 0
622	Antinous .. .. (*L. C. Myra*×*C. Enid*) ..	2 2 0
623	Aphrodite .. .. (*C. Mendelii*×*L. purpurata*) ..	1 1 0
624	,, **Rex.** Petals and sepals white, lip rich crimson	5 5 0
625	Appam .. .. (*L. C. Scylla*×*C. Dowiana aurea*) ..	10 6
626	Arachne.. .. .. (*C. labiata*×*L. C. Haroldiana*) ..	1 11 6
627	Ariadne .. .. (*C. Dowiana*×*L. C. Alcyone*) ..	1 1 0
628	Ariel .. .. (*C. Dowiana aurea*×*L. Cowanii*) ..	2 2 0
629	Artemis .. .. (*C. Olivia*×*L. C. Cappei*) ..	15 0
630	Astarte .. .. (*L. C. Sylvia*×*L. C. Ariel* ..	1 1 0
631	Atalanta .. .. (*C. Warscewiczii*×*L. C. elegans*) ..	1 1 0
632	Athene .. .. (*L. C. callistoglossa*×*L. C. St. Gothard*) ..	1 11 6
633	,, **Fine variety**	3 3 0
634	Aureole .. .. (*C. Iris*×*L. C. luminosa*) ..	2 2 0
635	Baden Powell .. .. (*C. Lawrenceana*×*L. tenebrosa*) ..	10 6
636	Barbarossa .. .. (*C. Trianæ*×*L. C. callistoglossa*) ..	1 1 0
637	,, **Fine variety**	3 3 0
638	Baroness Emma .. .. (*L. C. eximia*×*C. Hardyana*) ..	1 1 0
639	Baroness Schroder .. ..(*L. Jongheana*×*C. Trianæ*) ..	1 1 0
640	Basil .. ..(*C. Mantinii*×*L. C. callistoglossa*) ..	15 0
641	Beatrice.. .. .. (*C. Schroderæ*×*L. C. callistoglossa*) ..	1 11 6
642	bella .. .. (*L. purpurata*×*C. labiata*) ..	15 0
643	,, **alba.** Pure white petals and sepals, rich crimson purple lip	2 2 0
644	,, **albens**	1 11 6
645	Berthe Fournier .. .. (*L. C. elegans*×*C. Dowiana*) ..	1 1 0
646	Black Prince .. .. (*L. C. bletchleyensis*×*C. Hardyana*) ..	2 2 0
647	bletchleyensis .. .. (*C. Warscewiczii*×*L. tenebrosa*) ..	1 1 0
648	,, **The King.** Magnificent in size, form and colour	5 5 0
649	Bola .. .. (*C. labiata*×*L. C. callistoglossa*) ..	1 1 0
650	,, **Fine variety**	3 3 0
651	Brasseur Hye .. .. (*L. C. Aphrodite*×*C. Warscewiczii*) ..	15 0
652	Britannia .. .. (*C. Warscewiczii*×*L. C. Canhamiana*) ..	1 1 0
653	,, **Melanie** .. .. (*C. Warscewiczii, Frau Melanie Beyrodt* × *L. C. Canhamiana alba*) ..	3 3 0
654	Bronze King .. .. (*L. C. Anaconda*×*L. C. luminosa*) ..	1 1 0
655	Brutus .. .. (*C. Warscewiczii*×*L. C. bletchleyensis*) ..	1 1 0
656	Bryan .. .. (*L. crispa*×*C. Gaskelliana*) ..	10 6

LÆLIOCATTLEYA.

Nos.			Each. £ s. d.
657	Buenos Aires	(*L. C. bletchleyensis*×*C. Enid*)	1 1 0
658	Calabria	(*C. Schroderæ*×*L. C. Myra*)	10 6
659	callistoglossa	(*L. purpurata*×*C. Warscewiczii*)	1 1 0
660	,,	**Fine variety**	2 2 0
661	Calypso	(*C. Mrs. Pitt*×*L. C. St. Gothard*)	3 3 0
662	Canada	(*L. C. Dominiana*×*C. Schroderæ*)	1 1 0
663	Canhamiana	(*L. purpurata*×*C. Mossiæ*)	15 0
664	,,	**alba** (*L. purpurata alba*×*C. Mossiæ Reineckiana*)	3 3 0
665	,,	**albens**	2 2 0
666	,,	**Fire King.** One of the darkest and best varieties	5 5 0
667	,,	**grandis.** A fine bold well-coloured flower	4 4 0
668	,,	**Rosslyn var.** The richest and best of all Canhamianas	10 10 0
669	Cappei	(*L. cinnabarina*×*C. Warscewiczii*)	1 1 0
670	,,	**Charlesworthii. F.C.C. R.H.S.**	3 3 0
671	Carmen	(*L. C. Dominiana*×*L. C. Wellsiana*)	15 0
672	Carmencita	(*C. Dowiana*×*L. C. luminosa*)	1 1 0
673	Celia	(*C. superba*×*L. purpurata*)	10 6
674	Ceres	(*C. Mossiæ*×*L. C. Hippolyta*)	15 0
675	Chione	(*L. C. Wellsiana*×*L. flava*)	10 6
676	Cholletiana	(*L. superbiens*×*C. Mossiæ*)	4 4 0
677	Circe	(*L. C. Alcippe*×*L. C. Hypatia*)	15 0
678	Clarice	(*C. Empress Frederick*×*L. C. Fascinator*)	1 1 0
679	Clementine	(*L. C. Feronia*×*L. C. Fascinator*)	1 1 0
680	,,	**Fine variety**	3 3 0
681	Clive	(*L. pumila, præstans*×*C. Dowiana aurea*)	1 11 6
682	Colmaniana	(*C. Dowiana*×*L. C. callistoglossa*)	1 1 0
683	Copia	(*L. C. Haroldiana*×*L. C. Hypatia*)	15 0
684	Cornelia	(*L. pumila*×*C. labiata*)	1 1 0
685	Coronis	(*C. labiata*×*L. cinnabarina*)	10 6
686	Cortina	(*C. Empress Frederick*×*L. C. callistoglossa*)	1 11 6
687	,,	**Fine variety**	5 5 0
688	Cowanii	(*C. Mossiæ*×*L. cinnabarina*)	10 6
689	Creola	(*C. Warscewiczii*×*L. C. luminosa*)	1 1 0
690	Creusa	(*C. Octave Doin*×*L. Coronet*)	1 11 6
691	Cupid	(*C. Mossiæ*×*L. Latona*)	10 6
692	Daphne	(*C. Mossiæ*×*L. C. Schilleriana*)	1 11 6
693	Delia	(*C. Percivaliana*×*L. C. Gottoiana*)	10 6
694	Denganii	(*L. C. Cappei*×*C. Dowiana*)	15 0
695	Dominiana	(*L. purpurata*×*C. Dowiana*)	1 1 0
696	,,	**Fine variety**	3 3 0
697	,,	**Queen Mary.** Dark petals and sepals, and very rich lip	5 5 0

LÆLIOCATTLEYA.

Nos.			Each. £ s. d.
698	Domos	(*C. Mossiæ*×*L. C. Dominiana*)	1 1 0
699	Domphrodite	(*L. C. Dominiana*×*L. C. Aphrodite*)	15 0
700	Dora	(*L. C. Hippolyta, Phœbe*×*C. Schroderæ*)	15 0
701	Doreen	(*L. C. Elinor*×*C. Dowiana aurea*)	10 6
702	Doris	(*L. harpophylla*×*C. Trianæ*)	10 6
703	Dr. R. Schiffmann	(*L. C. callistoglossa*×*C. Mendelii*)	3 3 0
704	Edith	(*L. C. Geo. Woodhams*×*C. Enid*)	1 1 0
705	Electryon	(*C. Trianæ*×*L. C. Hypatia*)	15 0
706	Elinor	(*L. Coronet*×*C. Schroderæ*)	15 0
707	Elva	(*L. C. Ingramii*×*C. Warscewiczii*)	1 1 0
708	„ **magnifica**		3 3 0
709	Epicasta	(*L. pumila*×*C. Warscewiczii*)	10 6
710	Eric	(*L. C. St. Gothard*×*C. Empress Frederick*)	1 1 0
711	Eteocle	(*L. C. Pallas*×*L. tenebrosa*)	10 6
712	Ettrick	(*C. Dowiana*×*L. C. bletchleyensis*)	1 1 0
713	Euripides	(*L. C. Goldcrest*×*L. C. Myra*)	2 2 0
714	„ **Fine yellow variety**		5 5 0
715	Eurydice	(*C. Empress Frederick*×*L. C. Gottoiana*)	1 1 0
716	Eurylochus	(*L. C. Lady Miller*×*C. granulosa Schofieldiana*)	1 11 6
717	Euryoda	(*L. C. Eurydice*×*C. Rhoda*)	3 3 0
718	Excelsior	(*C. Mendelii*×*L. C. Canhamiana*)	15 0
719	eximia	(*L. purpurata*×*C. Warneri*)	10 6
720	Fascinator	(*L. purpurata*×*C. Schroderæ*)	1 1 0
721	„ **Fine variety**		3 3 0
722	Fascinator-Mendelii	(*L. C. Fascinator*×*C. Mendelii*)	15 0
723	Felicia	(*L. C. Haroldiana*×*C. Trianæ*)	1 1 0
724	Feronia	(*L. C. Haroldiana*×*C. Enid*)	1 11 6
725	„ **Fine variety**		5 5 0
726	Floryi	(*C. Trianæ*×*L. C. C. G. Roebling Violetta*)	1 1 0
727	Fornax	(*C. Miss Harris*×*L. C. luminosa*)	1 11 6
728	Frederick Boyle, **Kerchoviæ**	(*L. anceps alba*×*C. Trianæ alba*)	3 3 0
729	Ganymede	(*L. Latona*×*C. Schroderæ*)	3 3 0
730	General Maude	(*L. C. rubens Lambeauiana*×*C. Hardyana*)	3 3 0
731	„ „ **rubens.** Rich crimson mauve petals and sepals, dark crimson lip		10 10 0
732	„ Sakharoff	(*L. C. callistoglossa*×*C. Gaskelliana*)	1 1 0
733	Geo. Woodhams	(*C. Hardyana*×*L. purpurata*)	15 0
734	G. G. Whitelegge	(*L. C. callistoglossa*×*C. Hardyana*)	15 0
735	Godmanii	(*L. C. callistoglossa*×*C. Iris*)	2 2 0
736	„ **Eva**		3 3 0
737	Goldcrest	(*L. Cowanii*×*C. Schroderæ*)	2 2 0
738	Golden Dawn	(*L. C. Trimyra*×*L. C. Lydia-Myra*)	2 2 0

LÆLIOCATTLEYA.

Nos.			Each. £ s. d.
739	Golden Glory	(*L. C. Zephyra*×*C. Mossiæ Reineckiana*)	7 7 0
740	Golden Oriole	(*L. C. Charlesworthii*×*C. Dowiana aurea*)	2 2 0
741	Goldfinch	(*L. C. warnhamiensis*×*C. Dowiana aurea*)	1 11 6
742	Gothaurea	(*L. C. St. Gothard*×*C. Dowiana aurea*)	3 3 0
743	Gottoiana	(*L. tenebrosa*×*C. Warneri*)	10 6
744	„ **grandis**		3 3 0
745	G. S. Ball	(*L. cinnabarina*×*C. Schroderæ*)	15 0
746	Haroldiana	(*L. tenebrosa*×*C. Hardyana*)	1 11 6
747	„ **aurifera**		5 5 0
748	Heckla	(*C. Fabia*×*L. C. luminosa*)	2 2 0
749	Hector	(*C. Dowiana*×*L. C. Martinetii*)	1 1 0
750	Helice	(*L. C. Florentia*×*C. Dowiana aurea*)	15 0
751	Henrietta	(*C. Bowringiana*×*L. C. Haroldiana*)	10 6
752	Henry Greenwood	(*L. C. Schilleriana*×*C. Hardyana*)	1 11 6
753	Hera	(*C. Hardyana*×*L. C. Issy*)	15 0
754	Hiawatha	(*C. Warneri*×*L. C. Aphrodite*)	1 1 0
755	highburiensis	(*L. cinnabarina*×*C. Lawrenceana*)	2 2 0
756	Hippolyta	(*L. cinnabarina*×*C. Mossiæ*)	1 11 6
757	Hornimaniæ	(*C. Mantinii*×*L. C. luminosa*)	1 1 0
758	Hybo	(*C. Mrs. Frank Hurndell*×*L. C. Bola*)	3 3 0
759	Hyeana	(*L. purpurata*×*C. Lawrenceana*)	1 11 6
760	Ilene	(*L. C. Creusa*×*L. C. Golden Oriole*)	3 3 0
761	Ilione	(*L. C. Dominiana langleyensis*×*C. Bowringiana*)	15 0
762	Ingramii	(*L. Dayana*×*C. Dowiana aurea*)	1 1 0
763	Invincible	(*L. C. Dominiana*×*L. C. bletchleyensis*)	1 11 6
764	Iphis	(*L. C. Lydia-Myra*×*C. Schroderæ alba*)	10 6
765	Irene	(*C. Bowringiana*×*L. tenebrosa*)	10 6
766	Irensis	(*C. Iris*×*L. C. bletchleyensis*)	15 0
767	Isabel Sander	(*C. Mossiæ Reineckiana*×*L. C. Canhamiana alba*)	1 11 6
768	Issy	(*L. tenebrosa*×*C. Leopoldii*)	1 1 0
769	Ithaca	(*C. F. W. Wigan*×*L. C. Haroldiana*)	2 2 0
770	Ivernia	(*L. tenebrosa*×*L. C. callistoglossa*)	1 1 0
771	Ixion	(*C. Lueddemanniana*×*L. C. Myra*)	1 1 0
772	Jeannette	(*C. labiata*×*L. C. Gottoiana*)	1 11 6
773	Jessica	(*C. Dowiana aurea*×*L. C. Clive*)	1 1 0
774	Joy Sander	(*C. Schroderæ*×*L. C. luminosa*)	15 0
775	Juno	(*L. grandiflora*×*C. Mossiæ*)	15 0
776	Juturna	(*L. C. Charlesworthii*×*L. C. Myra*)	1 1 0
777	Lady Miller	(*C. granulosa Schofieldiana*×*L. cinnabarina*)	2 2 0
778	La France	(*C. bicolor*×*L. tenebrosa*)	1 11 6
779	Larissa	(*C. Mendelii*×*L. flava*)	1 1 0

LÆLIOCATTLEYA.

Nos.			Each. £ s. d.
780	Laura	(*L. C. Scylla*×*C. Lord Rothschild*)	15 0
781	„ **Good yellow variety**		3 3 0
782	Leonora	(*C. Fabia*×*L. C. Canhamiana*)	1 11 6
783	Lily Measures	(*L. C. callistoglossa*×*L. C. Gottoiana*)	2 2 0
784	Linda	(*L. C. Arachne*×*C. Dowiana aurea*)	1 11 6
785	Lucasiana	(*L. tenebrosa*×*C. labiata flammea*)	10 6
786	Lucia	(*C. Mendelii*×*L. cinnabarina*)	1 1 0
787	Lucienne	(*C. Daphne*×*L. C. St. Gothard*)	3 3 0
788	luminosa	(*L. tenebrosa*×*C. Dowiana aurea*)	1 1 0
789	„ **aurea**		3 3 0
790	„ **Fine variety**		5 5 0
791	Lusitania	(*C. Iris*×*L. C. Phryne*)	1 1 0
792	Lydia	(*C. Gaskelliana alba*×*L. Cowanii*)	1 11 0
793	Mabel	(*L. tenebrosa*×*C. Trianæ*)	10 6
794	Mandarin	(*C. granulosa*×*L. crispa*)	1 1 0
795	Marcus	(*C. Trianæ*×*L. C. Andromeda*)	2 2 0
796	Marguerite	(*L. C. Schilleriana*×*C. Warscewiczii*)	2 2 0
797	Marina	(*L. C. St. Gothard*×*C. Hardyana*)	1 1 0
798	„ **Fine variety**		3 3 0
799	Marshal Foch	(*L. C. Myrrha*×*C. Luegeæ*)	3 3 0
800	„ „ **Fine variety**		5 5 0
801	Martinetii	(*L. tenebrosa*×*C. Mossiæ*)	1 11 6
802	„ **King Christian**		5 5 0
803	matuta	(*L. C. bletchleyensis*×*L. præstans*)	10 6
804	Maudiæ	(*L. C. Neleus*×*C. Dowiana aurea*)	2 2 0
805	„ **Good variety**		4 4 0
806	Mauretania	(*L. C. Canhamiana*×*L. C. Martinetii*)	1 1 0
807	Mercia	(*L. flava*×*C. Schroderæ*)	1 1 0
808	Messina	(*C. Mantinii*×*L. C. Cappei*)	1 11 6
809	Midas	(*C. Percivaliana*×*L. C. Golden Glory*)	3 3 0
810	Milly	(*C. Mantinii*×*L. C. bletchleyensis*)	1 11 6
811	Minnie de Larrinaga	(*C. Fabia*×*L. C. Bola*)	2 2 0
812	„ „ **Fine variety**		5 5 0
813	Miranda	(*L. C. Dominiana*×*L. C. St. Gothard*)	1 11 6
814	Mita	(*C. Fabia*×*L. C. Golden Oriole*)	2 2 0
815	Momus	(*L. C. rubens Lambeauiæ*×*C. Octave Doin*)	5 5 0
816	„ **Fine variety.** A wonderful hybrid, the L. præstans parent predominating it for shape and colour		10 10 0
817	„ **Sir Arthur Pearson.** For size and richness of colour, one of the best from this marvellous cross		26 5 0
818	Moonbeam	(*C. Schroderæ*×*L. C. G. S. Ball*)	1 1 0
819	Moyra	(*C. Warscewiczii*×*L. C. Clonia*)	1 11 6

LÆLIOCATTLEYA.

Nos.			Each. £ s. d.
820	Mrs. Findley	(*L. C. Elva×C. Hardyana*)	2 2 0
821	Mrs. Geoffrey Tate	(*L. C. Golden Oriole×L. C. Orion*)	3 3 0
822	Mygdon	(*C. Trianæ×L. C. luminosa*)	1 1 0
823	,, **Good variety**		3 3 0
824	Myra	(*L. flava×C. Trianæ*)	1 11 6
825	,, **Etoile d'Or**		3 3 0
826	Myrrha	(*C. Dowiana×L. C. Gottoiana*)	1 11 6
827	,, **Fine variety**		4 4 0
828	Neleus	(*C. Iris×L. C. Ophir*)	1 11 6
829	,, **Fine yellow variety**		5 5 0
830	Nella	(*L. C. Dominiana×C. labiata*)	1 1 0
831	Nelthorpe Beauclerk	(*C. Enid×L. C. Gottoiana*)	2 2 0
832	Nemea	(*C. Mantinii×L. C. Haroldiana*)	15 0
833	Numidia	(*C. Empress Frederick×L. C. Golden Oriole*)	2 2 0
834	Nyctea	(*L. C. luminosa×L. C. Myra*)	1 11 6
835	Nysa	(*C. Warscewiczii×L. crispa*)	10 6
836	Nysiata	(*C. labiata×L. C. Nysa*)	15 0
837	Olenus	(*C. Dowiana Rosita×L. C. bletchleyensis*)	2 12 6
838	Ophir	(*L. xanthina×C. Dowiana aurea*)	2 2 0
839	Orion	(*L. C. Haroldiana×C. Dowiana*)	2 12 6
840	,, **Good variety**		5 5 0
841	Osram	(*C. Dowiana aurea×L. C. C. G. Roebling*)	1 11 6
842	Pactolus	(*L. C. Massangeana×C. Dowiana aurea*)	1 11 6
843	Pagasa	(*C. Trianæ×L. C. C. G. Roebling, Violetta*)	1 1 0
844	Parysatis	(*L. pumila×C. Bowringiana*)	10 6
845	Peleus	(*C. Enid×L. C. Dominiana*)	1 11 6
846	Pelias	(*C. Warneri×L. C. Fascinator*)	1 1 0
847	Percy Scott	(*L. elegans Stelzneriana×C. Hardyana*)	5 5 0
848	Phicomene	(*L. C. Lady Rothschild×C. Dowiana aurea*)	1 11 6
849	Phœbe **magnifica**	(*C. Mossiæ×L. cinnabarina*)	3 3 0
850	Phœbus	(*C. Iris×L. C. Cappei*)	1 1 0
851	President Wilson	(*L. C. Thyone×C. Dowiana aurea*)	3 3 0
852	Prospero	(*C. Trianæ×L. C. Charlesworthii*)	1 11 6
853	Purple Emperor	(*C. Warscewiczii×L. C. callistoglossa*)	1 11 6
854	,, ,, **Fine variety**		3 3 0
855	Rosalind	(*C. Trianæ×L. C. Dominiana*)	2 2 0
856	,, **Fine variety**		5 5 0
857	Roumania	(*L. C. Lusitania×C. Dowiana aurea*)	1 11 6
858	rubens	(*L. pumila præstans×C. Hardyana*)	1 1 0
859	,, **Lambeauiæ**		1 1 0
860	St. George	(*L. C. St. Gothard×C. Fabia*)	1 11 6
861	,, ,, **Fine variety**		5 5 0

LÆLIOCATTLEYA.

Nos.		Each. £ s. d.
862	St. Gothard .. .. (*C. Hardyana*×*L. C. Gottoiana*) ..	1 11 6
863	,, ,, **Fine variety**	5 5 0
864	,, ,, **F.C.C. R.H.S.** Good plant with 4 bulbs, 1 of which is a lead ..	15 15 0
865	Salonica .. .. (*L. C. Fascinator*×*C. Warscewiczii Frau Melanie Beyrodt*) ..	15 0
866	San Juan .. .. (*L. C. Aphrodite*×*C. Mendelii*) ..	2 12 6
867	Santa-Fe .. .. (*L. C. Copia*×*C. Enid*) ..	1 11 6
868	Schilleriana .. .. (*L. purpurata*×*C. intermedia*) ..	10 6
869	Schroderæ .. .. .. (*C. Maggie Raphael alba*×*L. C. bella alba*) ..	1 1 0
870	,, **Good variety**	3 3 0
871	Scylla .. .. (*L. C. Cappei*×*C. Lord Rothschild*) ..	1 11 6
872	,, **Good variety**	3 3 0
873	Selene .. .. (*L. C. Fascinator*×*C. Trianæ*) ..	15 0
874	Semiramis .. .. (*L. Perrinii*×*C. Gaskelliana*) ..	15 0
875	Senate .. .. (*C. labiata*×*L. C. Orion*) ..	1 11 6
876	,, **Fine variety**	3 3 0
877	Serbia .. .. (*L. C. St. Gothard*×*C. Enid*) ..	2 2 0
878	,, **Good variety**	4 4 0
879	,, **A.M. variety. R.H.S.** One of the best from this excellent cross	15 15 0
880	,, **Excelsior.** A Læliocattleya worthy of a place in the choicest collection ..	10 10 0
881	Sibyl .. .. (*L. C. Dominiana*×*C. Mendelii*) ..	1 11 6
882	Silvana .. .. (*L. C. Haroldiana*×*L. pumila præstans*) ..	15 0
883	Smilax .. .. (*L. C. Charlesworthii*×*C. Enid*) ..	1 1 0
884	S. O. Stephenson .. .. .. (*L. purpurata*×*C. Empress Frederick*) ..	1 11 6
885	Soulange .. .. (*L. C. lustre*×*C. Dowiana*) ..	2 2 0
886	Statteriana .. .. (*L. Perrinii*×*C. labiata*) ..	2 2 0
887	Sunray .. .. (*L. cinnabarina*×*C. superba*) ..	2 12 6
888	Sunstar .. .. (*L. C. Andromeda*×*L. C. Myra*) ..	2 2 0
889	,, **Good variety**	5 5 0
890	Sylvia .. .. (*L. C. Ascania*×*L. C. Hippolyta Phœbe*) ..	1 1 0
891	,, **Yellow variety**	3 3 0
892	Teucra .. .. (*C. Mossiæ*×*L. C. Martinetii*) ..	1 11 6
893	Thea .. .. *C. Percivaliana*×*L. C. luminosa*) ..	15 0
894	Thurgoodiana .. .. (*C. Hardyana*×*L. C. Martinetii*) ..	2 2 0
895	,, **Good variety**	4 4 0
896	Thyone .. .. (*L. C. Ophir*×*C. Dowiana aurea*) ..	1 11 6
897	,, **Good variety**	3 3 0
898	Ulysses .. .. (*L. C. Fascinator*×*C. Mossiæ Reineckiana*) ..	1 12 6
899	,, **purity.** Petals, sepals, and lip pure white, with a pale lemon throat	7 7 0
900	Venada .. .. (*L. C. Baroness Schroder*×*C. Dowiana aurea*) ..	1 1 0
901	Vera .. .. (*L. C. Black Prince*×*C. labiata*) ..	15 0
902	Virginia .. .. (*C. Harrisoniana*×*L. purpurata*) ..	10 6

LÆLIOCATTLEYA.

Nos.			Each. £ s. d.
903	Walter Gott	(*L. C. bletchleyensis*×*C. bicolor*)	1 1 0
904	warnhamiensis	(*L. cinnabarina*×*C. Trianæ*)	1 11 6
905	Watsonii	(*L. C. Canhamiana alba*×*C. Schroderæ alba*)	2 2 0
906	Wellesleyi	(*L. C. Martinetii*×*C. Warscewiczii*)	5 5 0
907	Wellsiana	(*L. purpurata*×*C. Trianæ*)	1 11 6
908	,, **alba**		3 3 0
909	West Point Rex	(*L. C. bletchleyensis*×*C. Empress Frederick*)	3 3 0
910	Yellow Prince	(*C. Gaskelliana*×*L. xanthina*)	3 3 0
911	Zeno	(*L. C. St. Gothard*×*C. Luegeæ*)	2 2 0
912	,, **Good variety**		5 5 0
913	,, **A.M. variety. R.H.S.** A grand Læliocattleya, and a pleasing result from two fine parents		15 15 0

MILTONIA SPECIES.

VIGOROUS PLANTS WITH 3 TO 5 BULBS, AND ONE OR MORE CLEAN HEALTHY NEW GROWTHS.

914	flavescens		10 6
915	Phalænopsis (Now become rare)		1 1 0
916	,, **Good variety**		1 11 6
917	Schroderiana. **A.M. R.H.S.**		10 10 0
918	spectabilis, Moreliana		10 6
919	vexillaria		7 6
920	,, **alba.** (The pure albino). Nice plant of 3 bulbs, 1 of which is a strong lead		15 15 0
921	,, **Cobbiana**		3 3 0
922	,, **Constance**		5 5 0
923	,, **delicatissima**		3 3 0
924	,, **Empress Augusta Victoria**		2 2 0
925	,, **Fairy Queen**		3 3 0
926	,, **Fine variety**		1 1 0
927	,, **grandis**		3 3 0
928	,, **H. G. Milner**		4 4 0
929	,, **Leopoldii**		1 1 0
930	,, **leucoglossa**		1 11 6
931	,, **magnifica**		2 2 0
932	,, **Marshall Foch**		3 3 0
933	,, **memoria G. D. Owen**		7 7 0
934	,, **Mœnsii**		3 3 0

MILTONIA SPECIES.

Nos.			Each. £ s. d.
935	vexillaria	**nobilior, Vine House variety**	2 2 0
936	,,	**Queen Alexandra**	7 7 0
937	,,	**robusta**	1 1 0
938	,,	,, **var: Lucretia**	3 3 0
939	,,	**Robsoniæ**	2 2 0
940	,,	**roseum**	15 0
941	,,	**rubella**	10 6
942	,,	**Shogan**	5 5 0
943	,,	**superba**	10 6
944	,,	**violacea**	1 1 0
945	Warscewiczii	.. ..	1 1 0
946	,,	**leucochila. A.M. R.H.S.**	5 5 0

MILTONIA HYBRIDS.

947	Bleuana	.. .. (*vexillaria*×*Roezlii*) ..	10 6
948	,,	**Fine variety**	1 1 0
949	,,	**nobilior**	1 11 6
950	,,	**Pitt's variety**	3 3 0
951	Bluntii	(Natural hybrid) .. .. (*Clowesii*×*spectabilis*) ..	1 1 0
952	,,	**Lubbersiana**	1 11 6
953	Charlesworthii	.. .. (*vexillaria memoria G. D. Owen*×*Hyeana*) Superior to its parent, G. D. Owen, the mask being larger and richer in colour	3 3 0
954	,,	Stronger plants, having 2 and 3 new growths	5 5 0
955	,,	**Fine variety**	10 10 0
956	,,	**var. nobilior.** The mask is of a dark crimson and extending further down the lip than in the type	15 15 0
957	Dulcies	.. .. (*vexillaria*×*Leopoldii*) ..	10 6
958	Hyeana	.. ..(*Bleuana*×*vexillaria*) ..	10 6
959	,,	**Fine variety**	2 2 0
960	,,	**var: F.M. Ogilvie** (*Bleuana Stevensii*×*vexillaria memoria G. D. Owen*)	2 2 0
961	Isabel Sander	.. .. (*Hyeana*×*Roezlii*) ..	15 0
962	,,	,, **A.M. R.H.S.** A very pleasing and distinct variety..	7 7 0
963	,,	,, **Fine variety**	2 2 0
964	,,	,, **lustre.** A beautiful richly rayed variety. A good plant with 3 bulbs, all having leaves, 1 of which is a lead	5 5 0
965	Lena	.. .. (*vexillaria superba*×*Charlesworthii*) ..	2 2 0
966	Princess Mary	.. .. (*Hyeana*×*Bleuana*) ..	1 11 6
967	St. Andre	.. .. (*Roezlii*×*Bleuana*) ..	1 1 0

MILTONIA HYBRIDS.

Nos.			Each. £ s. d.
968	Venus	(*vexillaria*×*Phalænopsis*) ..	3 3 0
969	,, **Fine variety**		5 5 0
970	vexillaria, **var: Hesperia**	(*vexillaria Leopoldii*×*vexillaria Dulcies*) ..	1 1 0
971	,, ,, **Lyoth** ..	(*vexillaria chelsiensis*×*vexillaria G. D. Owen*) ..	4 4 0
972	,, ,, ,,	Stronger plants having 2 and 3 new growths	5 5 0
973	,, ,, ,, **Fine variety**		7 7 0

MILTONIODA

974	Ajax.	(*C. Noezliana*×*M. Schroderiana*) A splendid plant of 4 good bulbs, well leaved, 1 of which is a lead ..	4 4 0
975	Harwoodii.	(*C. Noezliana*×*M. vexillaria*) A nice plant of 4 bulbs, well leaved, 1 of which is a lead	3 3 0
976	,, **Excelsior. F.C.C. R.H.S.** See illustration.	(*C. Noezliana*×*M. vexillaria Queen Alexandra*) A very fine plant of 3 bulbs, well leaved, 1 is a lead	36 15 0
977	,, **Shrubbery var. A.M. R.H.S.**	(*C. Noezliana*×*M. vexillaria*) A nice healthy plant of 5 bulbs, well leaved, 1 of which is a lead ..	15 15 0
978	,, **Special variety.**	(*C. Noezliana*×*M. vexillaria, Queen Alexandra*) A good strong plant of 3 fine bulbs, all having leaves, 1 of which is a splendid lead	10 10 0

ODONTIODA.

HEALTHY, VIGOROUS PLANTS, HAVING 4 TO 6 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

979	Alcantara	(*Oda. Cooksoniæ*×*O. eximium*) ..	15 0
980	,, **A.M. R.H.S.**	A good plant with 4 bulbs, well leaved, 1 of which is a lead	10 10 0
981	Alcazar	(*Oda. Hippolyta*×*O. l'Empereur*) ..	1 1 0
982	,, **Fine variety**		3 3 0
983	Alcides	(*Oda. Lambeauiana*×*Oda. Royal Gem*) ..	15 0
984	,, **Good variety**		2 2 0
985	Alva	(*Oda. Wilsonii*×*O. Harryanum*) ..	10 6
986	Amata	(*Oda. Bohnhofiæ*×*Oda. Charlesworthii*) ..	1 1 0
987	Angela	.. (*O. Doris*×*Oda. Cooksoniæ*) ..	1 1 0
988	,, **Fine variety**		5 5 0
989	Antonio	(*Oda. Cooksoniæ*×*O. Harryanum*) ..	10 6

MILTONIODA HARWOODII, VARIETY EXCELSIOR

(COCHLIODA NOEZLIANA X MILTONIA VEXILLARIA, VARIETY QUEEN ALEXANDRA)

F.C.C. R.H.S. 29/6/1920

ODONTIODA.

Nos.		Each. £ s. d.
990	Aphrodite .. .. (*Oda. Diana*×*O. eximium*) ..	1 1 0
991	,, **Special variety**	5 5 0
992	,, **A.M. R.H.S.** A splendid plant with 4 bulbs, well leaved, 1 of which is a lead	10 10 0
993	Arlotta .. .. (*Oda. heatonensis*×*O. eximium*) ..	10 6
994	,, **Very fine variety**	5 5 0
995	Automa .. .. (*Oda. Bradshawiæ*×*O. Harryanum*) ..	15 0
996	Beryl .. .. (*O. eximium*×*Oda. Wilsonii*) ..	1 1 0
997	,, **Good variety**	2 12 6
998	Bohnhofiæ .. .. (*O. cirrhosum*×*C. vulcanica*) ..	10 6
999	Boltone .. .. (*O. Aireworth*×*Oda. Charlesworthii*) ..	15 0
1000	Borda .. ..(*C. Noezliana, Fine var.*×*O. Nathaniel*) ..	10 6
1001	Borne .. .. (*Oda. Bradshawiæ*×*O. Louise*) ..	15 0
1002	Brackenhurst .. .. (*Oda. Charlesworthii*×*O. eximium*) ..	10 6
1003	,, **Fine variety**	3 3 0
1004	Bradshawiæ .. .. (*O. crispum*×*C. Noezliana*) ..	10 6
1005	,, **Fine variety**	3 3 0
1006	Brewii .. .. (*Oda. Charlesworthii*×*O. Harryanum*) ..	1 11 6
1007	,, **callistoglossa**	5 5 0
1008	,, **cupreum.** A distinct copper shaded variety	7 7 0
1009	,, **sanguinea.** A bright and pleasing variety	6 6 0
1010	,, **Nubian Prince.** An extremely dark variety	7 7 0
1011	Carmen .. .. (*O. nebulosum*×*C. Noezliana*) ..	1 11 6
1012	Chanticleer .. .. (*C. Noezliana*×*Oda. Cooksoniæ*) ..	5 5 0
1013	,, **Fine variety.** Similar to a glorified C. Noezliana	8 8 0
1014	Charlesworthii .. .. (*O. Harryanum*×*C. Noezliana*) ..	1 11 6
1015	,, **cupreum.** The copper coloured variety	10 10 0
1016	chelsiensis .. .. (*C. vulcanica*×*O. crispum*) ..	10 6
1017	Cheringes .. .. (*O. Lawrenceanum*×*Oda. Joan*) ..	1 1 0
1018	Cilleham .. .. (*O. illustissimum*×*Oda. Joan*) ..	15 0
1019	Clarissa .. .. (*Oda. Bradshawiæ*×*O. illustrissimum*) ..	1 11 6
1020	Codeham .. .. (*Oda. Royal Gem*×*O. eximium*) ..	2 2 0
1021	Colinge .. .. (*O. crispum, Ethel*×*Oda. Coronation*) ..	1 11 6
1022	,, **Good variety**	5 5 0
1023	,, **Specially fine variety**	7 7 0
1024	Colmaniæ .. .. (*Oda. Bradshawiæ*×*O. hybrid*) ..	1 1 0
1025	,, **Fine variety**	3 13 6
1026	Cooksoniæ .. .. (*O. ardentissimum*×*C. Noezliana*) ..	1 1 0
1027	Cora .. .. (*Oda. Coronation*×*O. eximium*) ..	2 2 0
1028	,, **Good variety**	5 5 0
1029	Cornelest .. .. (*Oda. Lambeauiana*×*O. Dora*) ..	1 1 0
1030	Coronation .. .. (*O.* ? ×*Oda. Vuylstekeæ*) ..	3 3 0

ODONTIODA.

Nos.		Each. £ s. d.
1031	Coronation, **Fine variety**	5 5 0
1032	Craveniana (*O. cordatum*×*C. Noezliana*)	10 6
1033	Dacia (*O. eximium*×*Oda. Joan*)	15 0
1034	„ **Good variety**	2 12 6
1035	Daphne (*Oda. heatonensis*×*O. Edwardii*)	1 1 0
1036	Devossiana (*O. Edwardii*×*C. Noezliana*)	1 1 0
1037	Diana (*O. amabile*×*C. Noezliana*)	10 6
1038	Dodeham (*O. crispum*×*Oda. Joan*)	1 1 0
1039	Don (*C. Noezliana*×*O. Lindleyanum*)	7 6
1040	Donna (*O. illustrissimum*×*Oda. Leeana*)	2 2 0
1041	Dora (*O. Jasper*×*Oda. Vuylstekeæ*)	3 3 0
1042	Dulcies (*Oda. Cooksoniæ*×*O. illustrissimum*)	1 1 0
1043	„ **Very fine variety**	5 5 0
1044	Elsie (*C. Noezliana*×*Oda. Charlesworthii*)	15 0
1045	Eric (*Oda. Bradshawiæ*×*O. Clytie*)	15 0
1046	Ethel (*Oda. chelsiensis*×*O. percultum*)	15 0
1047	Eurydice (*Oda. Vuylstekeæ*×*O. Phœbe*)	1 11 6
1048	Euterpe (*O. Uro-Skinneri*×*C. Noezliana*)	1 1 0
1049	Feronia (*Oda. Bradshawiæ*×*O. Edwardii*)	1 1 0
1050	Florence (*Oda. Cooksoniæ*×*O. Dora*)	2 2 0
1051	„ **Extra fine variety**	7 7 0
1052	Ganesa (*Oda. Brewii*×*O. President Poincare*)	3 3 0
1053	Garnet (*Oda. keighleyensis*×*O. eximium*)	2 2 0
1054	„ **Fine richly coloured variety**	5 5 0
1055	gattonensis (*O. polyxanthum*×*C. Noezliana*)	10 6
1056	Gwendoline (*O. eximium*×*Oda. Madeline*)	1 11 6
1057	„ **Good variety**	4 4 0
1058	Hemera (*Oda. Brewii*×*O. Aireworth*)	2 2 0
1059	Hera (*Oda. Lambeauiana*×*O. amabile splendens*)	1 11 6
1060	„ **Fine variety**	3 13 6
1061	Hermione (*C. vulcanica*×*Oda. heatonensis*)	15 0
1062	„ **Fine variety**	3 3 0
1063	Hertha (*Oda. Lambeauiana*×*Oda. Joan*)	1 1 0
1064	Hiawatha (*Oda. Charlesworthii*×*Oda. Coronation*)	2 2 0
1065	„ **Splendid variety**	7 7 0
1066	Hilda (*O. Dora*×*Oda. Royal Gem*)	1 1 0
1067	„ **Extra fine variety**	4 4 0
1068	Hippolyta (*Oda. Bradshawiæ*×*O. amabile*)	10 6
1069	Hypatia (*O. ardentissimum*×*Oda. Diana*)	15 0
1070	illustris (*Oda. Charlesworthii*×*O. illustrissimum*)	1 11 6
1071	Iona (*O. Jasper*×*Oda. Coronation*)	2 2 0

ODONTIODA.

Nos.			Each. £ s. d.
1072	Irene	(*Oda. Charlesworthii*×*O. Uro-Skinneri*)	2 2 0
1073	Isabella	(*O. Chanticleer*×*O. crispum*)	5 5 0
1074	Janet	(*Oda. Wilsonii*×*Oda. Cooksoniæ*)	1 11 6
1075	Joan	(*Oda. Charlesworthii*×*O. ardentissimum*)	10 6
1076	,, **Harlequin**		4 4 0
1077	Joiceyii	(*O. Promerens*×*Oda. Coronation*)	5 5 0
1078	,, **Special variety**		10 10 0
1079	Joyce	(*O. Harryanum*×*Oda. Royal Gem*)	3 3 0
1080	Juliet	(*Oda. Bradshawiæ*×*O. Promerens*)	3 3 0
1081	,, **Splendid variety**		8 8 0
1082	Karoa	(*O. Louise*×*Oda. Joan*)	15 0
1083	keighleyensis	(*O. cirrhosum*×*C. Noezliana*)	10 6
1084	Lakonia	(*O. Aireworth*×*Oda. Cooksoniæ*)	2 2 0
1085	Lambeauiana	(*C. Noezliana*×*O. Lambeauianum*)	1 1 0
1086	,, **Extra fine variety**		5 5 0
1087	Latona	(*Oda. Bradshawiæ*×*O. crispo-Harryanum*)	1 1 0
1088	Laura	(*Oda. Brewii*×*Oda. Coronation*)	2 2 0
1089	Lerna	(*Oda. Joan*×*O. Dusky Monarch*)	3 3 0
1090	Lorna	(*Oda. Lambeauiana*×*O. Olympia*)	2 2 0
1091	lutescens	(*Oda. Schroderiana*×*O. crispum xanthotes*)	3 3 0
1092	Lutetia	(*O. luteopurpureum*×*C. Noezliana*)	10 6
1093	Lydia	(*O. Jasper*×*C. Noezliana*)	1 11 6
1094	,, **Special variety**		5 5 0
1095	Lyra	(*O. Jasper*×*Oda. Royal Gem*)	1 1 0
1096	Madeline	(*Oda. Charlesworthii*×*O. crispum*)	15 0
1097	,, **Extra fine variety**		3 3 0
1098	Manora	(*C. Noezliana*×*Oda. Coronation*)	2 2 0
1099	,, **Fine variety**		5 5 0
1100	Marina	(*Oda. Diana*×*O. Dusky Monarch*)	2 2 0
1101	,, **Good variety**		4 4 0
1102	Marjorie	(*O. Alexandrina*×*Oda. Joan*)	1 11 6
1103	,, **Distinct variety**		3 13 6
1104	Maureen	(*O. eximium*×*Oda. Chanticleer*)	3 3 0
1105	Mena	(*Oda. Lambeauiana*×*O. eximium*)	1 11 6
1106	,, **Extra fine variety**		5 5 0
1107	Mercia	(*O. Dora*×*Oda. Felicia*)	15 0
1108	Metis	(*Oda. Brewii*×*O. eximium*)	2 2 0
1109	Moyra	(*C. vulcanica*×*Oda. Charlesworthii*)	1 1 0
1110	Nada	(*Oda. Red Cross*×*O. eximium*)	3 3 0
1111	,, **Splendid variety**		10 10 0
1112	Naralda	(*O. Doris*×*Oda. Bradshawiæ*)	1 11 6

ODONTIODA.

Nos.		Each. £ s. d.
1113	Naralda, **Good variety**	5 5 0
1114	Nobworth (*O. Pescatorei×Oda. Charlesworthii*)	1 1 0
1115	Norah (*O. Aireworth×Oda. Schroderiana*)	2 2 0
1116	„ **Fine variety**	5 5 0
1117	oakwoodiensis (*Oda. Bradshawiæ×O. percultum*)	1 1 0
1118	Orion (*O. Jasper×Oda. Charlesworthii*)	2 2 0
1119	„ **Good variety**	4 4 0
1120	Orthia (*O. Louise×Oda. Royal Gem*)	2 2 0
1121	„ **Fine variety**	3 13 6
1122	Pandora (*C. vulcanica×O. Vuylstekeæ*)	15 0
1123	Patricia (*O. Phœbe×Oda. Charlesworthii*)	1 1 0
1124	Phyllis (*Oda. Bradshawiæ×O. Lambeauianum*)	1 11 6
1125	„ **Good variety**	4 4 0
1126	Priola (*O. Rolfeæ×Oda. Madeline*)	15 0
1127	Priscilla (*Oda. Lambeauïana×O. Jasper*)	1 1 0
1128	„ **Distinct variety**	3 3 0
1129	Queen Mary. **F.C.C. R.H.S.** (*O. eximium×Oda. Vuylstekeæ*). Splendid plant having 4 fine bulbs, 3 of which have leaves, and making a strong new growth	10 10 0
1130	Ramona (*O. crispo-Harryanum×Oda. Sanderæ*)	1 11 6
1131	Red Cross (*Oda. Cooksoniæ×O. ardentissimum*)	2 2 0
1132	„ „ **Specially fine variety**	7 7 0
1133	rosefieldiensis (*O. triumphans×C. Noezliana*)	1 1 0
1134	Royal Gem (*Oda. Vuylstekeæ×O. ardentissimum*)	2 2 0
1135	„ „ **Good variety**	5 5 0
1136	St. Fuscien (*O. Adrianæ×C. Noezliana*)	1 1 0
1137	Saga (*Oda. Elissa×O. Doris magnificum*)	1 11 6
1138	Sanderæ (*C. Noezliana×O. percultum*)	2 2 0
1139	Schroderiana (*Oda. Bradshawiæ×O. crispum*)	1 1 0
1140	„ **Special variety**	5 5 0
1141	Selene (*O. Louise×Oda. Cooksoniæ*)	15 0
1142	Sensation (*Oda. Vuylstekeæ×O. crispum*)	1 11 6
1143	Seymouræ (*Oda. Charlesworthii×Oda. Bradshawiæ*)	15 0
1144	Sheila (*O. Aireworth×Oda. Chanticleer*)	2 12 6
1145	„ **Good variety**	5 5 0
1146	Sir Douglas Haig (*Oda. Cooksoniæ×O. percultum*)	5 5 0
1147	Stephensonii (*O. Aireworth×Oda. Schroderiana*)	2 2 0
1148	Sultan (*Oda. Charlesworthii×O. crispo-Harryanum*)	10 6
1149	Synia (*Oda. Joan×O. Kilburneanum*)	1 11 6
1150	Tacita (*O. illustrissimum×Oda. Royal Gem*)	10 6
1151	„ **Very distinct variety**	4 4 0
1152	Thelma (*O. Dora×Oda. Wilsonii*)	1 1 0
1153	„ **Good variety**	3 3 0

ODONTIODA.

Nos.			Each. £ s. d.
1154	Theresa	(*Oda. Dora*×*Oda. Coronation*)	1 11 6
1155	„ **Distinct variety**		3 3 0
1156	Thiasa	(*Oda. Brewii*×*O. l'Aiglon majesticum*)	2 2 0
1157	Valda	(*O. Louise*×*Oda. Coronation*)	1 1 0
1158	Valeria	(*O. Jasper*×*Oda. Cooksoniæ*)	1 11 6
1159	„ **Extra fine variety**		4 4 0
1160	Vara	(*Oda. Bradshawiæ*×*Oda. Coronation*)	3 3 0
1161	venusta	(*Oda. Cooksoniæ*×*O. amabile*)	1 1 0
1162	Vera	(*O. Elissa*×*Oda. Joan*)	10 6
1163	Vesta	(*Oda. Charlesworthii*×*O. Prince Albert*)	1 1 0
1164	„ **Distinct variety**		2 12 6
1165	Vivienne	(*Oda. Cooksoniæ*×*O. crispum*)	1 11 6
1166	Vuylstekeæ	(*O. Pescatorei*×*C. Noezliana*)	10 6
1167	West Point Beauty	(*Oda. Bradshawiæ*×*O. eximium*)	1 11 6
1168	„ „ „ Good variety		3 3 0
1169	Wilsonii	(*C. vulcanica*×*O. Pescatorei*)	1 1 0
1170	„ **Fine variety**		2 12 6
1171	„ **The President. A.M. R.H.S.** Nice plant with 5 bulbs, 4 of which have leaves, and 1 lead		10 10 0
1172	Zampa	(*Oda. Cooksoniæ*×*Oda. Coronation*)	1 11 6
1173	Zarina	(*O. crispo-Harryanum*×*Oda. Chanticleer*)	2 2 0
1174	Zenobia	(*Oda. Charlesworthii*×*O. percultum*)	1 1 0
1175	Zillah	(*O. Jasper*×*Oda. Diana*)	15 0

ODONTOGLOSSUM SPECIES.

HEALTHY VIGOROUS PLANTS, HAVING 4 TO 6 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

Our new type of Odontoglossum crispum is acknowledged by all lovers of this fine old species to be a wonderful achievement of the raiser's skill. About ten years ago, we crossed two selected varieties of the old plain Pacho type which produced seedlings of a greatly improved strain. Again selecting the best and crossing with another grand variety of the imported class, the result is a type of crispum so far superior to anything possible to import that it might almost be called a new species, but is now known as **"Charlesworth's Premier Type."**

The illustration at page 36 gives a fair representation of a few of the best-named varieties included in the Catalogue, others at lower prices are in stock and flowers with particulars of the plants will be gladly sent on application.

Nos.		Each. £ s. d.
1176	aspidorhinum	10 6
1177	bictonense	10 6
1178	„ **album**	1 11 6

ODONTOGLOSSUM SPECIES.

Nos.			Each. £ s. d.
1179	cirrhosum		10 6
1180	citrosmum		10 6
1181	,,	**album**	10 6
1182	cordatum		10 6
1183	,,	**aureum**	2 2 0
1184	crispum		7 6
1185	,,	stronger plants	10 6
1186	,,	**Albania.** A fine blotched variety produced by crossing O. crispum Lucianii with a good blotched crispum	10 10 0
1187	,,	**aurantiacum.** A very distinct variety, having a large base of yellow in interior of lip	3 3 0
1188	,,	**blotched varieties**	10 6
1189	,,	**Bonnyanum**	1 11 6
1190	,,	**Cooksonianum**	2 2 0
1191	,,	**Doin's variety.** One of the parents of our noted "Charlesworth's Premier Type." A very good plant of 4 bulbs, 1 of which is a strong lead	10 10 0
1192	,,	**Ebor.** (*crispum Solum*×*crispum Bonnyanum*) A very richly blotched variety of good shape. Fine plant of 3 bulbs having leaves, 1 of which is a strong lead	10 10 0
1193	,,	**floribundum.** A good shaped plain variety	1 1 0
1194	,,	**heatonensis.** A fine blotched variety	7 7 0
1195	,,	**hololeucum**	5 5 0
1196	,,	**Imperatrix roseum.** A good plant of 4 bulbs, and making a strong new growth	3 3 0
1197	,,	**Impregnable** "Premier Type." A splendid plant of 4 bulbs, all having leaves, and 1 of which is a very strong lead	42 0 0
1198	,,	**Incomparable.** "Premier Type." A very fine plant of 4 bulbs, 3 of which have leaves and 1 of which is a strong lead	63 0 0
1199	,,	**Indomitable.** "Premier Type." Strong plant of 4 bulbs, 3 having leaves, and 1 of which is a splendid lead	45 0 0
1200	,,	**Inflexible.** "Premier Type." A splendid plant of 3 strong bulbs, one of which is a fine lead	52 10 0
1201	,,	**Invincible.** "Premier Type." A nice plant of 4 bulbs, 2 with leaves, and 1 of which is a strong lead	47 7 0
1202	,,	**Invulnerable.** "Premier Type." A fine plant of 3 good bulbs having leaves, and 1 of which is a strong lead	42 0 0
1203	,,	**Joan.** A good shaped blotched variety	4 4 0
1204	,,	**Lady Mollie.** A most distinct crispum, with a peculiar yellow marking on the petals, lined with rich brown	7 17 6
1205	,,	**Lucianii.** One of the best of the blotched varieties. Nice plant of 4 bulbs, and making a strong new growth	10 10 0
1206	,,	**Lyoth.** A splendid variety of the blotched type	12 12 0
1207	,,	**Mont Blanc.** A grand variety of the Pacho type. Fine plant with 3 good bulbs, 1 of which is a strong lead	26 5 0

ODONTOGLOSSUM CRISPUM

"CHARLESWORTH'S PREMIER TYPE"

ODONTOGLOSSUM SPECIES.

Nos.			Each. £ s. d.
1208	crispum,	**Prince George of Wales.** A magnificently coloured flower, large in size and of good shape and substance. A fine plant of 5 bulbs, 1 of which is a strong lead..	10 10 0
1209	,,	**Princess Mary.** A richly blotched variety..	10 10 0
1210	,,	**Princess Maud.** A rosy variety with many spots	7 7 0
1211	,,	**Queen Empress.** A remarkable crispum of the rosy type. A strong plant having 3 good bulbs, 1 of which is a lead..	15 15 0
1212	,,	**Queen Maud.** Petals spotted with crimson, tips of which are infolded..	7 7 0
1213	,,	**Renown.** "Premier Type." A splendid plant of 3 bulbs, all with leaves, 1 of which is a strong lead..	52 10 0
1214	,,	**roseum magnificum.** One of the best of the rosy type	5 5 0
1215	,,	,, **punctatum**	4 4 0
1216	,,	**Rosy dawn**..	7 7 0
1217	,,	**Senator.** "Premier Type." A good plant of 4 bulbs, 2 of which have leaves, 1 is a strong lead	42 0 0
1218	,,	**Seraphim.** A splendid variety of the Pacho type	15 15 0
1219	,,	**Sirius.** A heavily blotched variety	7 7 0
1220	,,	**Solum.** An Unique crispum. Lip almost wholly dark ruby-purple. Sepals and petals white, with an occasional spot of the same colour as the lip. Fine plant of 3 bulbs and making a vigorous new growth	26 5 0
1221	,,	**Trianæ**	2 2 0
1222	,,	**Venus.** A fine old Pacho crispum. A magnificent plant of 4 fine bulbs, well leaved, and making a strong new growth	15 15 0
1223	,,	**Victoria Regina.** A good spotted variety	4 4 0
1224	,,	**Victory.** A magnificent crispum of the Pacho type, for size, shape and substance one of the very best. Good plant of 2 strong bulbs, and making a vigorous new growth	36 15 0
1225	,,	**virginale**	6 6 0
1226	,,	,, **Fine variety**	10 10 0
1227	,,	**xanthotes**	5 5 0
1228	,,	,, **Fine variety**	7 17 6
1229	,,	,, **Charlesworthii**	10 10 0
1230	,,	,, **Lady Newnes**	21 0 0
1231	,,	,, **Snowflake**	15 15 0
1232	,,	**Zenobia.** A fine plain crispum of extra good form and substance. Magnificent plant of 4 fine bulbs, well leaved, and making a very strong new growth	26 5 0
1233	,,	**Zenith.** Another good Pacho crispum. Fine plant of 4 strong bulbs, well leaved, and making a fine new growth..	26 5 0
1234	crocidipterum	.. ..	10 6
1235	Edwardii	.. ..	15 0
1236	grande	.. ..	7 6
1237	,, **aureum**	.. ..	5 5 0

ODONTOGLOSSUM SPECIES.

Nos.		Each. £ s. d.
1238	Hallii	10 6
1239	„ **King Edward VII.**	1 1 0
1240	Harryanum	10 6
1241	„ **Fine variety**	1 11 6
1242	„ **magnificum.** One of the best varieties of Harryanum we have seen, and a proved good hybridizing parent..	15 15 0
1243	hastilabium	1 1 0
1244	„ **Charlesworth's variety**	3 3 0
1245	Insleayi	1 1 0
1246	„ **splendens**	1 11 6
1247	Kegeljani (syn. polyxanthum)	1 1 0
1248	læve	1 1 0
1249	Lindenii	1 11 6
1250	luteopurpureum	15 0
1251	„ **hystrix**	1 1 0
1252	„ „ **grandiflorum**	1 11 6
1253	„ **sceptrum**	15 0
1254	„ „ **Argus**	1 11 6
1255	„ „ **aureum**	2 2 0
1256	„ **Vuylstekeanum**	3 3 0
1257	maculatum	10 6
1258	nebulosum	10 6
1259	„ **Fine variety**	1 1 0
1260	Pescatorei	7 6
1261	„ **Fine variety.** Specially fine lip	1 1 0
1262	„ **Album**	3 3 0
1263	„ **Charlesworthii. F.C.C. R.H.S.** One of the finest spotted forms. A splendid plant of 4 strong bulbs, 3 having leaves, and 1 of which is a fine lead..	26 5 0
1264	pulchellum majus	7 6
1265	ramosissimum	10 6
1266	Reichenheimii	10 6
1267	Rossii majus	7 6
1268	„ „ **Fine variety**	1 1 0
1269	triumphans	7 6
1270	„ **aureum**..	5 5 0
1271	„ **Crawshayanum**	3 3 0
1272	Uro-Skinneri	10 6
1273	„ „ **album**	3 3 0
1274	„ „ **incarnata**	3 3 0
1275	„ „ **Wilson Potter's variety**	3 3 0

ODONTOGLOSSUM HYBRIDS.

HEALTHY, VIGOROUS PLANTS, HAVING 4 TO 6 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

Nos.			Each. £ s. d.
1276	Admiral	(*eximium*×*Pescatorei*)	10 6
1277	Adrianæ	(*crispum*×*Hunnewellianum*)	7 6
1278	,, **Celia**		10 6
1279	Adula	(*eximium*×*Doris*)	2 2 0
1280	,, **Fine variety**		5 5 0
1281	Agapetum	(*amabile*×*Maillardianum*)	1 1 0
1282	,, **Good variety**		3 3 0
1283	Aireworth	(*Lambeauianum*×*crispum*)	10 6
1284	,, **Fine variety**		2 12 6
1285	amabile	(*crispum*×*crispo-Harryanum*)	10 6
1286	,, **Fine variety**		2 2 0
1287	,, **splendens**		5 5 0
1288	Amethyst	(*Lambeauianum*×*eximium*)	1 11 6
1289	,, **Good variety**		3 3 0
1290	Amillus	(*Amethyst*×*illustrissimum*)	2 2 0
1291	amœnum	(*Pescatorei*×*sceptrum*)	10 6
1292	Anaphe	(*crispum*×*Uro-Skinneri*)	10 6
1293	Andersonianum	(*crispum*×*gloriosum*)	7 6
1294	Antinous	(*Othello*×*excellens*)	1 11 6
1295	Antiope	(*Edwardii*×*Rossii*)	1 1 0
1296	Aphrodite	(*eximium*×*President Poincare*)	2 2 0
1297	,, **Good variety**		5 5 0
1298	Ardentdora	(*ardentissimum*×*Dora*)	2 2 0
1299	ardentillus	(*ardentissimum*×*illustrissimum*)	1 11 6
1300	ardentisper	(*ardentissimum*×*Jasper*)	15 0
1301	ardentissimum	(*Pescatorei*×*crispum*)	10 6
1302	,, **Doris**		5 5 0
1303	,, **Fine variety**		2 12 6
1304	,, **majesticum.** A grand variety, well spotted		10 10 0
1305	,, **Pintadeau.** A beautiful variety, the spotting approaching a violet colour		10 10 0
1306	,, **Princess**		7 7 0
1307	armainvillierensis xanthotes	(*crispum xanthotes Charlesworthii*×*Pescatorei album*)	3 3 0
1308	,, ,, **Fine variety**		6 6 0
1309	Ashworthianum	(*Edwardii*×*Ossulstonii*)	10 6
1310	Asian	(*Solon*×*Aquitania*)	5 5 0
1311	aspersum	(*Rossii*×*maculatum*)	2 2 0
1312	Aurora, **Fine variety**	(*Rossii rubescens*×*Lambeauianum*)	7 7 0
1313	bellatulum	(*crispum*×*tripudians*)	15 0

ODONTOGLOSSUM HYBRIDS.

Nos.			Each. £ s. d.
1314	Beryl	(*Uro-Skinneri* × *Amethyst*)	3 3 0
1315	Black Prince	(*Lambeauianum* × *Rolfeæ*)	1 11 6
1316	Boadicea aureum	(*ardentissimum xanthotes* × *triumphans aureum*)	2 2 0
1317	Bonaparte	(*l'Aiglon* × *percultum*)	2 2 0
1318	Britannia	(*Solon* × *The Czar*)	5 5 0
1319	,, **Good variety**		10 10 0
1320	,, **F.C.C. R.H.S.** A hybrid of exceptional merit. A model flower with equally broad segments, which are almost covered with claret-red blotches, the white ground showing effectively between the markings and on the fringed margin. A strong plant of 3 bulbs, two of which have leaves, and making a vigorous new growth		105 0 0
1321	Broteham	(*amabile* × *Lambardeanum*)	2 12 6
1322	Cardinal Wolseley	(*illustrissimum* × *Alexandrina*)	3 3 0
1323	,, ,, **Fine variety**		5 5 0
1324	Carola	(*Harryano-triumphans* × *Scottianum*)	10 6
1325	,, **Good variety**		1 11 6
1326	Ceres	(*Rossii* × *Rolfeæ*)	3 3 0
1327	,, **magnificum. F.C.C. R.H.S.**		7 7 0
1328	,, ,, **Goodson's variety. A.M. R.H.S.**		5 5 0
1329	,, **Plumpton Hall variety. A.M. R.H.S.**		5 5 0
1330	Cilledene	(*Crawshayanum* × *Canary*)	15 0
1331	Clytie	(*Edwardii* × *Pescatorei*)	1 1 0
1332	Cobbiæ	(*amabile* × *Pescatorei*)	15 0
1333	Conqueror	(*illustrissimum* × *crispum*)	1 11 6
1334	,, **Fine variety**		5 5 0
1335	conspicuum	(*amabile* × *percultum*)	1 1 0
1336	,, **Good variety**		3 3 0
1337	Cooksonianum	(*crispum* × *mirificum*)	10 6
1338	Coradinei. **Good variety**	(*crispum* × *Lindleyanum*)	10 6
1339	Crai	(*nitidum* × *Lambardeanum*)	2 12 6
1340	,, **Fine variety**		5 5 0
1341	Cravenianum	(*cirrhosum* × *ramosissimum*)	2 2 0
1342	Creola	(*Epicasta* × *Harryanum magnificum*)	1 11 6
1343	Creon	(*Jasper* × *Maillardianum*)	1 11 6
1344	,, **Fine variety**		3 13 6
1345	Crethus	(*Lambeauianum* × *Dusky Monarch*)	5 5 0
1346	,, **Extra fine variety**		10 10 0
1347	crispo-Harryanum	(*crispum* × *Harryanum*)	15 0
1348	,, ,, **Good variety**		2 2 0
1349	crispo-Solon	(*crispum* × *Solon*)	10 10 0

ODONTOGLOSSUM HYBRIDS.

Nos.		Each. £ s. d.
1350	crispo-Solon, **Fine distinct variety** of exceptional merit, perfect in size, shape and substance. Sepals and petals heavily blotched claret-red, edged with a deep white margin. A good plant of 3 bulbs, 1 of which is a strong lead	26 5 0
1351	Cumbe .. .. (*crispum xanthotes×Phillipsianum*) ..	1 1 0
1352	Cyrus .. .. (*eximium×Rolfeæ*) ..	1 11 6
1353	Desdemona .. .. (*ardentissimum×Hallii*) ..	10 6
1354	Dora .. .. (*Lambeauianum×Pescatorei*) ..	15 0
1355	,, **Good variety**	2 2 0
1356	,, **var. magnifica**	7 7 0
1357	Doreen .. .. (*eximium×Empress of India*) ..	2 2 0
1358	,, **Extra fine variety**	7 7 0
1359	Doris .. .. (*Ossulstonii×crispum*) ..	10 6
1360	,, **nice variety**	1 11 6
1361	,, **magnifica**	10 10 0
1362	Dorothea .. .. (*Doris×crispum*) ..	15 0
1363	,, **Fine variety**	2 2 0
1364	Dusky Queen .. .. (*Jasper×Aquitania*) ..	5 5 0
1365	Eadric .. .. (*Jasper×crispum*) ..	10 6
1366	,, **Good variety**	1 11 6
1367	Elaine .. .. (*cirrhosum×Harryanum*) ..	2 2 0
1368	Eleanor .. .. (*cirrhosum×Uro-Skinneri*) ..	2 12 6
1369	Elfrida .. .. (*ardentissimum×Uro-Skinneri*) ..	2 2 0
1370	Epicasta .. .. (*Clytie×crispum*) ..	10 6
1371	,, **Fine variety**	2 2 0
1372	Eros .. .. (*Othello×President Poincare*) ..	3 3 0
1373	,, **Extra variety**	5 5 0
1374	Eurydice .. .. (*hastilabium×cirrhosum*) ..	1 1 0
1375	excellens .. .. (*triumphans×Pescatorei*) ..	10 6
1376	,, **Good yellow variety**	1 11 6
1377	eximillus .. .. (*eximium×illustrissimum*) ..	2 2 0
1378	,, **Very fine variety.** Good shape and colour	5 5 0
1379	eximium .. .. (*ardentissimum×crispum*) ..	10 6
1380	,, **Ajax.** A splendid plant of 3 bulbs, 1 of which is a strong lead	10 10 0
1381	,, **Good variety**	1 11 6
1382	,, **Mrs. E. H. Robertson.** A strong plant of 4 bulbs, 1 of which is a good lead	7 17 6
1383	,, **var. Imperator.** A magnificent plant with 3 fine bulbs, all having leaves, and making a strong new growth	26 5 0
1384	,, **xanthotes** .. (*armainvillierensis xanthotes×crispum xanthotes Charlesworthii*)	3 13 6
1385	,, ,, **Fine variety**	7 7 0

ODONTOGLOSSUM HYBRIDS.

Nos.			Each. £ s. d.
1386	Fabia	(*eximium*×*l'Aiglon*)	2 2 0
1387	„ **extra fine variety**		10 10 0
1388	„ **good variety**		5 5 0
1389	Fascinator	(*Adrianæ*×*crispum*)	10 6
1390	„ **Fine coloured variety**		2 2 0
1391	Faustina	(*Dora*×*eximium*)	1 1 0
1392	„ **Good variety**		3 3 0
1393	Felicia	(*Thompsonianum*×*crispum*)	1 11 6
1394	Felicity	(*Olympia*×*ardentissimum*)	1 1 0
1395	„ **Fine variety**		3 3 0
1396	Fletcherianum	(*Edwardii*×*cirrhosum*)	10 6
1397	Gladys	(*cirrhosum*×*crispo-Harryanum*)	12 6
1398	Gloriette	(*President Poincare*×*crispum*)	2 2 0
1399	Godmanii	(*Edwardii*×*Rolfeæ*)	1 1 0
1400	Goodsonii. **Fine variety.** (*Uro-Skinneri*×*Pescatorei*). A splendid plant of 3 strong bulbs, all having leaves, 1 of which is a very fine lead		5 5 0
1401	Gorizia	(*Jasper*×*President Poincare*)	3 3 0
1402	„ **Good variety**		5 5 0
1403	Grand Monarque	(*eximium*×*laudatum*)	1 11 6
1404	„ „ **Extra fine variety**		3 3 0
1405	Groganiæ	(*Edwardii*×*Uro-Skinneri*)	1 0
1406	Hallio-crispum	(*Hallii*×*crispum*)	10 6
1407	Harold	(*Jasper*×*eximium*)	2 2 0
1408	„ **Good variety**		4 4 0
1409	harvengtense	(*crispum*×*triumphans*)	1 1 0
1410	Hecate	(*Crawshayanum*×*harvengtense*)	1 1 0
1411	Helvetia	(*crispo-Harryanum*×*Maillardianum*)	2 2 0
1412	„ **Good variety**		3 13 6
1413	Henry VIII.	(*Solon*×*l'Aiglon majesticum*)	5 5 0
1414	„ „ **Good variety**		7 17 6
1415	hibernicum	(*Hallii*×*hastilabium*)	1 11 6
1416	His Majesty (Parentage unrecorded). A good plant of 3 bulbs, 1 of which is a strong lead		21 0 0
1417	Humeanum	(*cordatum*×*Rossii*)	2 12 6
1418	Ianthe	(*ardentissimum*×*Hallio-crispum*)	15 0
1419	illustrissimum	(*Lambeauianum*×*ardentissimum*)	10 6
1420	„ **Good variety**		2 2 0
1421	illustworth	(*illustrissimum*×*Aireworth*)	1 11 6
1422	„ **Fine variety**		3 3 0
1423	Iphis	(*amabile Ajax*×*Her Majesty*	15 0
1424	„ **Good variety**		2 12 6
1425	Irene	(*Uro-Skinneri*×*Thompsonianum*)	2 2 0

ODONTOGLOSSUM HYBRIDS.

Nos.		Each. £ s. d.
1426	Ithone .. .. (*l'Aiglon×Dusky Monarch*) ..	5 5 0
1427	,, **Extra fine variety,** of perfect shape and rich purple colour..	15 15 0
1428	,, **Good variety**	8 8 0
1429	Ivernium .. .. (*Doris×Ossulstonii*) ..	1 1 0
1430	Jasper .. .. (*crispum×amabile*) ..	10 6
1431	,, **Good variety**	1 11 6
1432	Jaspworth .. .. (*Jasper×Aireworth*) ..	1 1 0
1433	Jeannette .. .. .. (*Rossii rubescens×amabile heatonense*) ..	3 3 0
1434	King Albert .. .. (*Armstrongiæ×crispum Lucianii*) ..	3 3 0
1435	l'Aiglon. .. .. (*Vuylstekeæ×eximium*) A very fine hybrid. The ground colour of the flower is white, but the surface is almost covered with reddish-orange brown blotches, with a crimson glow in places. Lip white, with chestnut red blotches. A splendid plant of 3 good bulbs, all having leaves, and 1 of which is a strong lead	21 0 0
1436	,, **majesticum**	26 5 0
1437	Lambeauianum .. .. .. (*Rolfeæ, fine variety×crispum Lucianii*) ..	10 6
1438	,, **albens**	3 3 0
1439	,, **Good variety**	1 11 6
1440	,, **Lyoth.** A good plant of 3 bulbs, all having leaves, and 1 of which is a lead	10 10 0
1441	laudatum .. .. (*ardentissimum×Wilckeanum*) ..	10 6
1442	,, **Distinct variety**	2 2 0
1443	Laurentia .. .. (*Jasper×Olympia*) ..	1 11 6
1444	,, **Fine variety**	3 3 0
1445	Lawrenceanum .. .. (*triumphans×Rolfeæ*) ..	15 0
1446	,, **Cobb's variety. A.M. R.H.S.** A magnificent plant of 4 gigantic bulbs, 3 having leaves, and 1 of which is a very strong lead	10 10 0
1447	Lilian .. .. (*Dora×Empress of India*) ..	15 0
1448	,, **Extra fine variety**	5 5 0
1449	,, **Good variety**..	2 2 0
1450	Llewellyn .. .. (*amabile×Georgius Rex*) ..	5 5 0
1451	Louise .. .. (*Ossulstonii×Pescatorei*) ..	1 11 6
1452	,, **Good variety**	2 12 6
1453	luminosum .. .. (*ardentissimum×Fascinator*) ..	10 6
1454	luridum .. .. (*Harryanum magnificum×Olympia*) ..	3 3 0
1455	,, **Fine variety**	5 5 0
1456	lutescens .. .. (*Lawrenceanum×Rolfeæ*) ..	2 2 0
1457	,, **Distinct variety**	3 13 6
1458	Maillardianum (Parentage unrecorded). A magnificent Odontoglossum. Size, shape and substance perfect. Colour dark chocolate on white ground. Splendid plant with 3 very fine bulbs, all having leaves, and 1 of which is an extra strong lead	52 10 0

ODONTOGLOSSUM HYBRIDS.

Nos.			Each. £ s. d.
1459	majesticum	(*eximium*×*percultum*)	15 0
1460	,, **Fine variety**		3 3 0
1461	Marathon	(*amabile*×*eximium*)	1 1 0
1462	,, **Distinct variety**		2 12 6
1463	Marcus	(*Jasper*×*Harryanum*)	12 6
1464	,, **Good variety**		1 11 6
1465	Marjorie	(*illustrissimum*×*Pescatorei Veitchii*)	15 0
1466	,, **Fine variety**		2 2 0
1467	Martius	(*amabile*×*Jasper*)	10 6
1468	,, **Good variety**		1 1 0
1469	Maudiæ	(*Hallii*×*Adrianæ*)	15 0
1470	Melanthus	(*illustrissimum*×*Nathaniel*)	1 11 6
1471	,, **Fine variety**		3 3 0
1472	Melpomene	(*l'Aiglon*×*Prince Albert*)	1 1 0
1473	,, **Fine distinct variety**		5 5 0
1474	Meteor	(*amabile*×*ardentissimum*)	15 0
1475	Miguelito.	(*Dora*×*Doris*)	1 1 0
1476	,, **Good variety**		2 12 6
1477	Mirabeau	(*mirum*×*Lambeauianum*)	1 11 6
1478	mirificum	(*sceptrum*×*crispum*)	10 6
1479	,, **Yellow variety**		1 11 6
1480	mirum	(*Wilckeanum*×*crispum*)	1 1 0
1481	,, **Fine variety**		3 13 6
1482	Mulus	(*gloriosum*×*luteopurpureum*)	10 6
1483	Myra	(*crispo-Harryanum*×*Aireworth*)	1 1 0
1484	Myrrha	(*Uro-Skinneri*×*armainvillierensis xanthotes*)	1 1 0
1485	Nora	(*illustrissimum*×*Dora*)	15 0
1486	Nortia	(*Jasper*×*Phœbe*)	1 1 0
1487	Olympia. **A.M. R.H.S.** (Parentage unrecorded). A large and showy hybrid. Flowers white, heavily barred and blotched with red-brown. Splendid plant of 3 bulbs, 2 of which have leaves, 1 is a strong lead		36 15 0
1488	Orestes	(*Dora*×*percultum Olympia*)	1 11 6
1489	,, **Good variety**		3 3 0
1490	Orosius	(*Solon*×*Maillardianum*)	2 2 0
1491	,, **Distinct variety**		4 4 0
1492	Ossulstonii	(*crispo-Harryanum*×*Pescatorei*)	15 0
1493	,, **J. Bradshaw**		2 2 0
1494	Othello	(*Harryanum*×*Adrianæ*)	1 11 6
1495	,, **Distinct yellow variety**		3 3 0
1496	Pallas	(*illustrissimum*×*Doris*)	2 2 0
1497	Palmeri	(*crispo-Harryanum*×*Lambeauianum*)	1 11 6
1498	Penelope	(*Rolfeæ*×*Olympia*)	3 3 0

ODONTOGLOSSUM HYBRIDS.

Nos.			Each. £ s. d.
1499	Penelope, **Good variety**		5 5 0
1500	percultum	(*Rolfeæ* × *ardentissimum*)	1 1 0
1501	,, **Good variety**		2 12 6
1502	,, **Olympia.** A splendid plant of 3 bulbs, all having leaves, 1 of which is a strong lead		10 10 0
1503	Persephone	(*Adrianæ* × *Pescatorei*)	10 6
1504	Phillipsianum aureum	(*eximium xanthotes* × *luteo-purpureum Vuylstekeanum*)	3 3 0
1505	Philomene	(*percultum* × *Rolfeæ*)	2 12 6
1506	,, **Fine variety**		5 5 0
1507	Phocis	(*Phœbe* × *Solon*)	1 1 0
1508	,, **Fine coloured variety**		2 2 0
1509	Phœbe	(*cirrhosum* × *crispum*)	10 6
1510	,, **Good variety**		1 1 0
1511	Phyllis	(*Ianthe* × *eximium*)	1 11 6
1512	,, **Good variety**		5 5 0
1513	plumptonense	(*amabile* × *Lambeauianum*)	1 1 0
1514	,, **Fine variety**		5 5 0
1515	Portia	(*illustrissimum* × *l'Aiglon*)	3 3 0
1516	Prince Edward	(*Rolfeæ* × *crispo-Harryanum*)	10 6
1517	,, ,, **Good variety**		2 2 0
1518	Princess Patricia	(*Dora* × *crispum Lucianii*)	1 11 6
1519	,, ,, **Fine variety**		3 3 0
1520	Princess Yolando	(*eximium* × *l'Empereur*)	5 5 0
1521	,, ,, **Fine coloured variety**		8 8 0
1522	princeps	(*crispum* × *Lawrenceanum*)	1 1 0
1523	Promerens	(*crispum* × *eximium*)	1 1 0
1524	,, **Good variety**		2 2 0
1525	,, **xanthotes**	(*eximium xanthotes* × *crispum xanthotes*)	3 13 6
1526	Pyramus	(*Louise* × *l'Empereur*)	3 3 0
1527	,, **Fine variety**		5 5 0
1528	Queen Alexandra	(*Harryanum* × *triumphans*)	1 1 0
1529	,, ,, **Good variety**		2 2 0
1530	,, ,, **Memoria Lionel Crawshay. A.M. R.H.S.** A good plant of 3 bulbs, all having leaves, 1 of which is a lead		10 10 0
1531	Radiant	(*Dora* × *Alexandrina*)	2 12 6
1532	,, **Good variety**		5 5 0
1533	Rayonatum	(*Lambeauianum* × *venustulum*)	1 11 6
1534	Red Admiral	(*eximium* × *Lambardeanum*)	3 3 0
1535	Redskin	(*Nathaniel* × *illustrissimum*)	2 2 0
1536	,, **Good variety**		3 13 6
1537	regale	(*Lawrenceanum* × *ardentissimum*)	1 1 0

ODONTOGLOSSUM HYBRIDS.

Nos.			Each. £ s. d.
1538	R. L. Harrow	(*crispo-Harryanum*×*eximium*)	15 0
1539	,, ,, **Distinct variety**		1 11 6
1540	Rolfeæ	(*Harryanum*×*Pescatorei*)	10 6
1541	,, **Good variety**		1 11 6
1542	Rosina	(*eximium*×*Lady Pirrie*)	3 3 0
1543	,, **Good variety**		5 5 0
1544	Rouge Dragon	(*Phœbe*×*ardentissimum*)	1 1 0
1545	rubens	(*ardentissimum*×*eximium*)	15 0
1546	,, **Good variety**		1 11 6
1547	Ruby	(*crispo-Harryanum*×*Vuylstekeæ*)	1 1 0
1548	St. Edmund	(*Jasper*×*crispo-Harryanum*)	2 2 0
1549	,, ,, **Fine variety**		5 5 0
1550	St. George	(*eximium*×*Alexandrina*)	3 3 0
1551	,, ,, **Good variety**		5 5 0
1552	St. James. **F.C.C. R.H.S.** (*amabile*×*Amethyst*) A noble Odontoglossum. The sepals and petals are violet-mauve with broad white margins and tips. Nice plant of 3 strong bulbs, 1 of which is a fine lead		131 5 0
1553	St. Nicholas	(*eximium*×*Promerens*)	1 1 0
1554	San-Luis	(*eximium*×*Fascinator*)	15 0
1555	scintillans	(*Rossii*×*Wilckeanum*)	2 2 0
1556	Scottianum	(*oakwoodiense*×*crispum*)	1 1 0
1557	Senlac	(*Jasper*×*Lambeauianum*)	10 6
1558	,, **Good variety**		1 1 0
1559	Serapis	(*eximium*×*Dusky Monarch*)	2 12 6
1560	,, **Fine variety**		5 5 0
1561	Smithii. F.C.C. R.H.S.	(*Rossii rubescens*×*crispo-Harryanum*)	10 10 0
1562	Solon	(*Adrianæ*×*ardentissimum*)	15 0
1563	,, **Good variety**		2 2 0
1564	Soramis	(*crispum*×*Phœbe*)	10 6
1565	splendens	(*eximium*×*Wilckeanum*)	1 1 0
1566	splendidum	(*ardentissimum*×*Pescatorei*)	15 0
1567	Stewartianum	(*Andersonianum*×*crispum*)	10 6
1568	Sybil	(*Thompsonianum*×*Aireworth*)	1 1 0
1569	Sylvia	(*cirrhosum*×*Rolfeæ*)	15 0
1570	Syrinx	(*crispum Lucianii*×*waltoniense*)	10 6
1571	Tagus	(*Othello*×*Doris magnificum*)	1 1 0
1572	,, **Good variety**		2 12 6
1573	Terentia	(*Maillardianum*×*illustrissimum*)	2 2 0
1574	,, **Distinct variety**		3 13 6
1575	Thetis	(*Solon*×*Dusky Monarch*)	5 5 0
1576	,, **Fine variety**		10 10 0

ODONTOGLOSSUM HYBRIDS.

Nos.			Each. £ s. d.
1577	Thwaitesiæ	(*Harryanum*×*Rossii*)	2 2 0
1578	„ **Fine variety**		5 5 0
1579	tigrinum	(*Fascinator*×*Harryanum*)	10 6
1580	Tityus	(*crispo-Harryanum*×*President Poincare*)	3 3 0
1581	„ **Good variety**		5 5 0
1582	„ **Magnificent variety.** A handsome plant with 3 bulbs, all having leaves, and 1 of which is a lead		10 10 0
1583	Trentino	(*crispo-Harryanum*×*Alexandrina*)	1 1 0
1584	„ **Good variety**		3 3 0
1585	Trident	(*eximium*×*King Albert*)	3 13 6
1586	„ **Fine variety**		5 5 0
1587	Venada	(*crispo-Harryanum*×*l'Aiglon*)	1 11 6
1588	„ **Good variety**		3 3 0
1589	Venilia	(*cirrhosum*×*Pescatorei*)	10 6
1590	venustulum	(*crispo-Harryanum*×*ardentissimum*)	15 0
1591	„ **Good variety**		1 11 6
1592	Vuylstekeæ	(*crispo-Harryanum*×*Vuystekei*)	1 11 6
1593	Vuylstekei	(*harvengtense*×*Wilckeanum*)	1 1 0
1594	waltoniense	(*crispum*×*polyxanthum*)	10 6
1595	„ **Yellow variety**		1 1 0
1596	warnhamense	(*Hallii*×*Pescatorei*)	10 6
1597	Watsonii	(*Aireworth*×*Maillardianum*)	3 3 0
1598	„ **Fine variety**		5 5 0
1599	Wiganianum	(*harvengtense*×*Rolfeæ*)	5 5 0
1600	Wilckeanum	(*crispum*×*luteopurpureum*)	10 6
1601	„ **aureum**	(*crispum xanthotes*×*luteopurpureum Vuylstekeanum*)	3 3 0
1602	„ **conspicuum.** A fine plant with 3 good bulbs and making a strong new growth		3 3 0
1603	Wilchello	(*Wilckeanum*×*Othello*)	1 11 6
1604	Williamsianum	(*grande*×*Schlieperianum*)	2 2 0
1605	Woronini	(*sceptrum*×*Rolfeæ*)	1 1 0
1606	Worsleyii	(*amabile*×*mirum*)	2 2 0
1607	wylamense	(*Harryanum*×*percultum*)	10 6
1608	xanthinum	(*armainvillierensis xanthotes*×*luteopurpureum Vuylstekeanum*)	3 3 0
1609	„ **Fine variety**		5 5 0
1610	Zulu	(*eximium*×*Harryanum*)	10 6
1611	„ **Good variety**		1 1 0

ODONTONIA HYBRIDS.

We have devoted considerable attention to the breeding of this bigeneric section, and during the last year the results of our efforts have been extremely encouraging.

The Royal Horticultural Society have distinguished no less than three with their highest award and six with their "Award of Merit," in addition to which the Manchester and North of England Orchid Society has conferred Gold Medals on two varieties.

In our opinion they are the Progenitors of a distinctly new series of Orchids, and a bridge between the warm growing Miltonias and the cool Odontoglossums and Odontiodas, by which we hope eventually to evolve what may be called a warm growing type of Odontoglossum which will appeal to our clients living in hot climates who at present are unable to grow the beautiful spray Odontoglossums.

		£	s.	d.
1612	ardens .. .. (*Odontonia Louise*×*O. amabile splendens*) A splendid plant of 4 bulbs and making a strong new growth..	5	5	0
1613	Bedfordiæ .. .. (*M. Bleuana*×*O. amabile splendens*) A very pretty and interesting cross. Miltonia vexillaria gives size and form to the lip and modifies the other segments. Splendid plant with 2 fine leaved bulbs and making a strong new growth	21	0	0
1614	Bedfordiæ. **A.M. R.H.S.** Sepals and petals white, with the basal halves delicately marked with violet. Lip white, with radiating spotted lines, featuring the mask of Miltonias. Very fine plant with 4 bulbs and making a strong new growth	52	10	0
1615	Bijou .. .. (*M. vexillaria*×*O. mirificum*) A very distinct variety, intermediate in size and of good shape. Cream ground colour, with pale brown markings. Nice plant with 3 bulbs, 1 of which is a strong lead..	26	5	0
1616	Bleu-ardent .. .. (*M. Bleuana*×*O. ardentissimum*) A fine flatly arranged flower, of a pale mauve colour with white tips and margin. Good healthy plant with 3 bulbs, 1 of which is a lead..	31	10	0
1617	brugensis .. .. (*M. vexillaria*×*O. Edwardii*) Good healthy plant with 3 fine bulbs, 1 of which is a lead	2	2	0
1618	Charlesworthii .. ..(*O. Uro-Skinneri*×*M. vexillaria*) A very fine hybrid. The sepals and broader petals blotched with reddish purple, front of lip a rich purplish rose, crest yellow, white base, having beautiful ruby red markings. Nice plant with 4 bulbs, 1 is a strong lead ..	10	10	0
1619	Ceres .. .. (*M. Bleuana*×*O. Lawrenceanum Cobbianum*) A pretty Miltonia-like flower, straw-yellow in colour, with reddish rose band in front of the yellow crest. Nice plant with 3 bulbs, 1 of which is a lead ..	21	0	0
1620	Ceres. **A.M. R.H.S.** Good plant having 3 bulbs, 2 of which are leads	26	5	0
1621	Corona .. ..(*M. Warscewiczii*×*O. Harryanum*) A fine plant with 4 bulbs and making a new lead	5	5	0
1622	Cybele .. .. (*O. cirrhosum*×*M. candida*) Good plant with 4 bulbs and making a new growth..	5	5	0
1623	Dora .. .. (*M. Bleuana*×*O. Dora*) A very fine flower, having much resemblance to Miltonia Bleuana, the colour being bright mauve, with white tips and margin	26	5	0
1624	Dora. **Fine variety.** Splendid plant with 3 bulbs and 1 fine lead	52	10	0
1625	Edna .. .. (*O. Wilckeanum*×*M. Warscewiczii*) Good plant with 4 bulbs, 1 of which is a fine lead	1	11	6

ODONTONIA HYBRIDS.

Nos.		Each. £ s. d.
1626	Edna. **Fine variety.** Very fine plant having 3 bulbs, 1 of which is a strong lead	3 3 0
1627	Eurydice .. .. (*M. Bleuana*×*O. Aireworth*) A very distinct flower, sepals and petals blotched with rich mauve, broken up towards edges into spots on a paler ground. Large open lip, with an orange mask, lower portion a pleasing mauve. Fine plant with 3 bulbs, 1 of which is a lead	26 5 0
1628	Gladys .. ..(*M. Bleuana*×*O. eximium*) A very fine cross, ground colour rose pink, richly blotched with clear violet. Nice healthy plant with 3 bulbs, 1 of which is a lead	26 5 0
1629	Irene .. ..(*M. Warscewiczii*×*O. hastilabium*) Healthy plant with 4 bulbs, 1 of which is a strong lead	2 2 0
1630	Irene. **Fine variety.** Splendid plant with 4 strong bulbs and making 1 very fine lead	5 5 0
1631	Iris .. .. (*M. Roezlii*×*O. Epicasta*) Magnificent plant with 3 bulbs and making a strong new growth..	3 3 0
1632	Lairesseæ .. .. (*O. crispum*×*M. Warscewiczii*) .. Splendid plant with 4 bulbs, 1 of which is a fine lead..	2 2 0
1633	Langowoyi .. .. (*O. Urg-Skinneri*×*M. Schroderiana*) Good plant with 4 strong bulbs and 1 good lead	3 3 0
1634	Langowoyi. **A.M. R.H.S.** Splendid plant having 3 fine bulbs and making a strong new growth	5 5 0
1635	Latona.. .. .. (*M. Bleuana*×*O. mirificum*) A handsome flower, approaching the Miltonia in size. Ground colour purple rose, sepals and petals densely spotted. Large open lip, yellow throat marked rich brown, shaded with pale mauve. Nice plant with 3 bulbs, 1 of which is a lead	21 0 0
1636	Leila .. .. (*M. Bleuana*×*O. promerens*) A flower of exceptional merit and of good shape, having rich maroon blotches on sepals and petals, the large lip being of a deep mauve, the whole flower having a white margin. Splendid plant of 3 bulbs, 1 of which is a strong lead	21 0 0
1637	Louise .. .. (*M. Warscewiczii*×*O. Ossulstonii*) Fine plant with 5 bulbs, 1 of which is a lead..	2 2 0
1638	Lucilia .. .. .. (*O. cirrhosum*×*M. spectabilis, Moreliana*) Good plant with 3 bulbs and making a strong growth..	2 2 0
1639	Magali Sander xanthotes (*M. Warscewiczii alba*×*O. ardentissimum xanthotes*) Fine plant with 4 bulbs, 1 of which is a lead..	3 3 0
1640	Magali Sander xanthotes. **Fine variety.** Grand plant having 4 strong bulbs and 1 lead..	5 5 0
1641	Melia .. ..(*O. Groganiæ*×*M. Bleuana*) A flower of intermediate size, the whole suffused with the violet purple of O. Groganiæ, showing the M. Bleuana distinctly in the lip. Splendid plant of 3 bulbs, 1 of which is a lead..	8 8 0
1642	Merope .. .. (*M. Bleuana*×*O. illustrissimum*) A very pleasing flower of the Miltonia shape. Rosy mauve sepals and petals tipped with white, carmine rose lip, with a striking margin of white. Nice plant of 2 bulbs and making a strong new growth..	21 0 0

ODONTONIA HYBRIDS.

Nos.		Each. £ s. d.
1643	Milly .. ..(*M. Bleuana*×*O. percultum*) A remarkable flower, almost as large as M. Bleuana, rich deep maroon sepals and petals, edged with rose purple, broad lip, rich chestnut base, with yellow disc, having a broad front area of white. Splendid plant of 4 bulbs, 1 of which is a strong lead	36 15 0
1644	Myra .. .. (*O. Ashworthianum*×*M. Charlesworthii*) A self-coloured flower of violet purple, the shape of same being distinctly of the Miltonia type. A nice plant of 3 bulbs, 1 of which is a lead..	10 10 0
1645	Norma .. .. (*M. Warscewiczii*×*O. eximium*) Splendid plant with 6 bulbs and making a strong new growth	5 5 0
1646	Nydia .. .. (*M. Hyeana*×*O. Harryanum*) A handsome flower, having a white ground with pale purple spottings on sepals and petals. Very large broad lip with a yellow disc, the lower portion being white. Nice plant of 2 bulbs and making a strong new growth	10 10 0
1647	Olivia .. .. (*M. Bleuana*×*O. triumphans Crawshayanum*) A flower of creamy white ground, sepals and petals densely spotted with pale brown, large lip, with an area of chestnut brown, margined with broad white band. A very fine plant of 3 bulbs, all leaved, 1 of which is a strong lead	5 5 0
1648	Pittiæ .. .. .. (*M. Bleuana, Pitt's var.*×*O. Harryanum magnificum*) A very remarkable combination, resulting in one of the most distinct and attractive of modern hybrids. The flower, which recalls some of the blue tinted Zygopetalums, is of fine shape, closely veined and tinged with dark violet colour, the base of the lip having yellowish lines. Splendid plant of 3 bulbs, 1 of which is a good lead..	52 10 0
1649	Sheila .. .. (*M. Bleuana*×*O. Lambeauianum*) A pleasing flower of the Miltonia size, having a carmine rose blotch in centre of sepals and petals, paler towards the edge. Lip broad, the upper portion densely spotted with rich brown, lower part pale mauve. A nice plant of 3 bulbs, 1 of which is a strong lead..	42 0 0
1650	Stella .. .. (*O. Ashworthianum*×*M. Bleuana, fine variety*) A remarkable flower of rich vinous purple, sepals and petals having a heliotrope margin. Medium size lip with a solid rich purple area almost to edge. A good plant of 2 bulbs, 1 of which is a strong lead	36 15 0
1651	Thais .. .. (*M. Bleuana*×*O. l'Aiglon majesticum*) An exquisite flower of large size and splendid shape, sepals and petals having a rosy ground with ruby coloured spotting. A splendid plant of 3 bulbs, well leaved, 1 of which is a very strong lead..	36 15 0
1652	Thisbe .. .. (*M. Bleuana*×*O. crispum xanthotes*) A medium size flower. Sepals, petals and lip nearly white, the latter having a yellow disc with reddish brown lines. Splendid plant with 3 bulbs and making a fine new growth	21 0 0
1653	Verona.. .. .. (*M. Bleuana*×*O. Rolfeæ*) A charming flower. Sepals and petals having a white ground densely spotted with claret purple. Large white lip with rich purple spots. Splendid plant of 3 bulbs, 1 of which is a fine lead..	15 15 0
1654	Vulcan .. .. (*Odontonia Louise*×*M. Charlesworthii*) A distinct hybrid of a rich purple colour, intermediate in shape and showing the Miltonia Charlesworthii largely in lip. Nice plant of 3 bulbs, 1 of which is a lead..	10 10 0

ODONTONIA PITTIÆ

(MILTONIA BLEUANA, PITT'S VAR.; X ODONTOGLOSSUM HARRYANUM MAGNIFICUM)

F.C.C. R.H.S. 10/2/1920

ONCIDIODA.

HEALTHY VIGOROUS PLANTS HAVING 4 TO 6 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

Nos.			Each. £ s. d.
1655	Bella	(*Onc. Marshallianum*×*C. Noezliana*)	3 3 0
1656	Charlesworthii	(*Onc. incurvum*×*C. Noezliana*)	1 11 6
1657	„ **Good variety**		3 3 0
1658	cinnabarina	(*Onc. monachicum*×*C. Noezliana*)	2 2 0
1659	„ **A.M. R.H.S.**	A healthy plant of 3 bulbs, 1 of which is a lead	3 3 0
1660	Cooksoniæ	(*Onc. macranthum*×*C. Noezliana*)	1 1 0
1661	„ **A.M. R.H.S.**	A nice plant of 5 bulbs and making a strong new growth	3 3 0
1662	Cora	(*Onc. Schlimii*×*C. Noezliana*)	1 11 6
1663	Marjorie	(*Onc. Forbesii*×*C. Noezliana*)	3 3 0
1664	Pallas	(*Onc. tigrinum*×*C. Noezliana*)	5 5 0
1665	Penelope	(*Onc. leucochilum*×*C. Noezliana*)	2 2 0

SOPHROCATTLEYA.

HEALTHY PLANTS HAVING 5 TO 7 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

Nos.			Each. £ s. d.
1666	Andromeda	(*C. Octave Doin*×*S. grandiflora*)	5 5 0
1667	Antiochus	(*S. C. Cleopatra*×*C. Warscewiczii*)	3 3 0
1668	Ardens	(*C. Fabia*×*S. C. Saxa*)	5 5 0
1669	Chamberlainiana	(*S. grandiflora*×*C. Harrisoniana*)	2 2 0
1670	Cleopatra	(*S. grandiflora*×*C. Leopoldii*)	4 4 0
1671	Dora	(*C. Dowiana*×*S. C. Cleopatra*)	5 5 0
1672	Doris	(*S. grandiflora*×*C. Dowiana aurea*)	5 5 0
1673	„ **Fine variety**		7 7 0
1674	Enid	(*S. grandiflora*×*C. Enid*)	2 12 6
1675	Enidoris	(*C. Enid*×*S. C. Doris*)	5 5 0
1676	Eva	(*S. C. Saxa*×*C. Enid*)	4 4 0
1677	Faboris	(*S. C. Doris*×*C. Fabia*)	5 5 0
1678	Lotte Muller	(*S. C. Nydia*×*C. Peetersii*)	7 7 0
1679	„ „ **Fine variety**		10 10 0
1680	Marcus	(*C. Enid*×*S. C. Calypso*)	5 5 0
1681	Maudiæ	(*S. grandiflora*×*C. Maggie Raphael*)	4 4 0
1682	Nydia	(*S. grandiflora*×*C. calummata*)	5 5 0
1683	Saxa	(*S. grandiflora*×*C. Trianæ*)	7 7 0
1684	warnhamensis	(*S. grandiflora*×*C. amethystoglossa*)	5 5 0

SOPHROLÆLIA.

HEALTHY PLANTS HAVING 5 TO 7 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

Nos.			Each. £ s. d.
1685	Felicia	(*S. L. heatonensis*×*L. pumila, præstans*)	2 12 6
1686	„ **Fine variety**		5 5 0
1687	Gratrixiæ	(*S. grandiflora*×*L. tenebrosa, Charlesworthii*)	5 5 0
1688	heatonensis	(*S. grandiflora*×*L. purpurata*)	4 4 0
1689	Leda	(*L. pumila, præstans*×*S. L. Gratrixiæ*)	3 3 0
1690	„ **Fine variety**		5 5 0
1691	Marriottiana	(*S. grandiflora*×*L. flava*)	3 3 0
1692	Psyche	(*L. cinnabarina*×*S. grandiflora*)	2 2 0
1693	„ **Good variety**		3 3 0

SOPHROLÆLIOCATTLEYA.

HEALTHY PLANTS HAVING 5 TO 7 BULBS, WELL LEAVED, AND ONE SOUND PROGRESSIVE LEAD.

Nos.			Each. £ s. d.
1694	Alethæa	(*S. L. Gratrixiæ*×*C. Percivaliana*)	2 2 0
1695	Anzac	(*L. C. Dominiana*×*S. L. C. Marathon*)	3 3 0
1696	„ **Extra fine variety**	Very rich colour and of good shape	10 10 0
1697	„ **Good variety**		5 5 0
1698	Cecil	(*C. Leda*×*S. L. C. Marathon*)	3 3 0
1699	Clio	(*S. grandiflora*×*S. L. C. Isis*)	3 3 0
1700	Delia	(*L. C. Gottoiana*×*S. C. Cleopatra*)	4 4 0
1701	de Vere Beauclerk	(*L. C. bletchleyensis*×*S. L. heatonensis*)	5 5 0
1702	Dido	(*C. Trianæ*×*S. L. heatonensis*)	3 13 6
1703	Electra	(*C. labiata*×*S. L. heatonensis*)	5 5 0
1704	Elissa	(*C. Hardyana*×*S. L. Gratrixiæ*)	3 3 0
1705	Goodsonii	(*S. L. heatonensis*×*L. C. luminosa*)	2 12 6
1706	Hebe	(*L. C. Haroldiana*×*S. L. Gratrixiæ*)	4 4 0
1707	Helen	(*L. C. Gottoiana*×*S. L. heatonensis*)	5 5 0
1708	His Majesty	(*S. L. C. Marathon*×*C. Trianæ Backhouseana*)	5 5 0
1709	„ „ **Fine variety**		10 10 0
1710	Isabella	(*S. L. C. Marathon*×*C. Fabia*)	4 4 0
1711	„ **Fine variety**		7 7 0
1712	Jeannette. **F.C.C. R.H.S.** A nice healthy plant of 5 bulbs, all with leaves and making a strong new growth	(*S. grandiflora*×*L. C. Martinetii*)	10 10 0

MILTONIODA HARWOODII, VARIETY EXCELSIOR

(COCHLIODA NOEZLIANA X MILTONIA VEXILLARIA, VARIETY QUEEN ALEXANDRA)

F.C.C. R.H.S. 29/6/1920

SOPHROLÆLIOCATTLEYA.

Nos.			Each. £ s. d.
1713	Joseph Charlesworth	(*L. C. Eurydice*×*S. L. C. Marathon*) ..	10 10 0
1714	„ „	**Fine variety**	15 15 0
1715	„ „	**F.C.C. R.H.S.** A good plant of 3 strong bulbs, all having leaves, 1 of which is a lead	52 10 0
1716	Laconia	(*S. L. heatonensis*×*L. C. callistoglossa*) ..	4 4 0
1717	„	**A.M. R.H.S.** A nice plant with 5 bulbs, 4 having leaves, 1 of which is a lead..	10 10 0
1718	Laura	(*S. L. C. Pandora*×*S. L. C. Marathon*) ..	3 3 0
1719	„	**A.M. R.H.S.** A splendid plant of 4 bulbs, all having leaves, 1 of which is a lead..	10 10 0
1720	Lutetia	(*S. L. C. Sandhaghe*×*C. Fabia*) .. Nice plant with 5 bulbs, 1 of which is a lead..	5 5 0
1721	Marathon	(*S. L. Psyche*×*C. Empress Frederick*) ..	2 2 0
1722	„	**Good variety**	5 5 0
1723	Menippe	(*S. L. heatonensis*×*C. Hardyana*) ..	5 5 0
1724	Meuse	(*S. L. C. Marathon*×*L. C. callistoglossa*) ..	3 3 0
1725	„	**Good variety**	5 5 0
1726	„	**var: General Nivelle. A.M. R.H.S.** Fine healthy plant of 5 bulbs, well leaved, 1 of which is a lead..	15 15 0
1727	Nestor	(*C. Dowiana*×*S. L. Gratrixiæ*) ..	5 5 0
1728	Niobe	(*S. L. Felicia*×*L. C. Gottoiana*) ..	3 3 0
1729	„	**A.M. R.H.S.** A fine plant of 4 good bulbs, all having leaves, 1 of which is a strong lead	10 10 0
1730	„	**Good variety**	5 5 0
1731	Œdipus	(*L. C. luminosa*×*S. C. Cleopatra*) ..	5 5 0
1732	Olive	(*S. L. Psyche*×*C. Enid*) ..	3 3 0
1733	Orion	(*C. Fabia*×*S. L. C. Menippe*) ..	4 4 0
1734	Pandora	(*C. Dowiana*×*S. L. heatonensis*) ..	5 5 0
1735	„	**Good variety**	7 7 0
1736	Penelope	(*L. C. Haroldiana*×*S. L. Psyche*) ..	2 2 0
1737	Pittiæ	(*S. L. C. Marathon*×*C. Maggie Raphael alba*) ..	10 10 0
1738	Ruby	(*C. Lord Rothschild*×*S. L. C. Marathon*) ..	5 5 0
1739	Ruth	(*S. L. C. Marathon*×*S. C. Doris*) ..	5 5 0
1740	Sandhaghe	(*S. L. heatonensis*×*C. Enid*) ..	4 4 0
1741	Sibyl	(*L. C. Haroldiana*×*S. L. heatonensis*) ..	4 4 0
1742	Thisbe	(*S. L. heatonensis*×*C. Iris*) ..	3 3 0
1743	Virginia	(*S. L. C. Marathon*×*L. C. St. Gothard*) ..	7 7 0
1744	„	**Fine variety.** A splendid plant of 5 bulbs, all with leaves, 1 of which is a very strong lead..	10 10 0

MISCELLANEOUS AND BOTANICAL SPECIES

MANY OF WHICH ARE BECOMING EXCEEDINGLY RARE.

Nos.		Each £ s. d.
1745	ACINETA colossa. Small plant with 4 bulbs, 1 young growth	2 2 0
1746	,, densa. Good plant with 3 bulbs, 1 of which is new	4 4 0
1747	,, Humboldtii. Fine plant with 4 good bulbs, 1 strong lead	1 1 0
1748	ACROPERIA Loddigesii. Good plant with 7 bulbs, well leaved, 1 lead	15 0
1749	ADA aurantiaca. Fine plants with 5 bulbs, well leaved, 1 lead..	10 6
1750	ADIODA St. Fuscien .. .. (*C. Noezliana*×*Ada aurantiaca*) Strong plant with 4 bulbs, well leaved, 1 lead	2 2 0
1751	ÆRANTHUS grandiflorus. Fine plant with 4 pairs of leaves	1 11 6
1752	,, Leonis. Good plant with 4 leaves	15 0

ÆRIDES.

1753	Ballantineanum. Magnificent plant with 8 pairs of leaves	3 3 0
1754	crispum. Nice healthy plant with 6 leaves.	1 1 0
1755	cylindricum. Fine plants with 6 to 8 pairs of leaves	15 0
1756	expansum. Nice plant with 4 pairs of leaves	1 1 0
1757	Fieldingii. Handsome plant with 7 pairs of leaves	10 6
1758	Houllettiana. Fine plant with 4 pairs of leaves	2 2 0
1759	Lobbii. Small plant with 3 pairs of leaves	1 1 0
1760	odoratum. Very fine plant with 5 pairs of leaves	15 0
1761	,, **album.** (Very rare) Splendid plant with 4 pairs of leaves	10 10 0
1762	roseum. Nice healthy plant with 2 pairs of leaves	1 11 6
1763	suavissimum. Small healthy plant with 5 leaves	2 2 0
1764	virens. Splendid plant with 5 pairs of leaves	1 1 0
1765	ANCISTROCHILUS Thompsonianus. Good plant with 6 bulbs, 2 of which are new	15 0

ANGRÆCUM.

1766	articulatum. Nice healthy plants with 2 pairs of leaves	1 11 6
1767	Brownii. Good plant with 4 pairs of leaves	2 2 0
1768	distichum. Fine plant with 7 growths	10 6
1769	Du Buyssonii. Nice healthy plant with 3 leaves	2 2 0

ANGRÆCUM.

Nos.		Each. £ s. d.
1770	eburneum. Magnificent plant with 3 pairs of leaves	1 1 0
1771	gracilipes. **A.M. R.H.S.** Splendid plant with 5 leaves	3 3 0
1772	,, Magnificent plant with 4 pairs of very fine large leaves	5 5 0
1773	picturatum. Nice plant with 3 stems, well leaved	1 1 0
1774	Sanderianum. Nice healthy plants with 2 pairs of leaves	1 1 0
1775	Scottianum. Good plant with 1 strong growth, having 8 leaves	5 5 0
1776	sesquipedale. Fine plant with 6 pairs of leaves	1 1 0
1777	,, Magnificent plant with 8 pairs of leaves	2 2 0
1778	ANGULOA Cliftonii. Nice plant with 2 bulbs, and 1 new growth	3 3 0
1779	,, Clowesii. Fine plant with 2 bulbs, and 1 new growth	2 2 0
1780	,, Ruckeri **sanguinea.** Good plants with 3 nice bulbs	2 12 6
1781	,, ,, **superba.** Grand plant with 3 very fine bulbs	3 3 0
1782	ARPOPHYLLUM giganteum. Splendid plant with 10 bulbs	1 1 0
1783	BRASSAVOLA Digbyana. Splendid plant with 6 bulbs, all leaved, 1 lead	2 2 0
1784	BRASSIA verrucosa. Good plant with 8 bulbs, well leaved, 1 lead	10 6
1785	BROUGHTONIA decora. Good plant with 8 bulbs, 4 of which are leads	1 1 0
1786	,, lilacina. Nice plant of 5 bulbs, 1 of which is a lead	1 11 6
1787	,, sanguinea. Strong plant of 9 bulbs, 2 of which are leads ..	10 6

BULBOPHYLLUM.

1788	anceps. Splendid plant of 6 bulbs, 2 of which are leads	1 11 6
1789	barbigerum. Very fine plants with 12 to 15 bulbs, 2 and 3 leads	1 1 0
1790	Careyanum. Good plants with 6 to 10 bulbs, 2 and 3 leads	10 6
1791	cupreum. Splendid plants with 6 to 8 bulbs, 2 new leads	10 6
1792	Dayanum. Good plant with 4 bulbs, and making 2 new growths	7 6
1793	Deari. Nice plants with 12 to 15 bulbs, 3 leads	2 2 0
1794	Ericssonii. Nice plant with 6 bulbs, 1 of which is a lead	1 11 6
1795	Fletcherianum. **A.M. R.H.S.** Fine plant with 4 bulbs, and making a strong new growth	5 5 0
1796	grandiflorum. Magnificent plants with 5 to 7 bulbs, 2 and 3 leads	4 4 0
1797	Lobbii. Grand plant with 8 bulbs, 2 of which are leads	10 6
1798	,, Fine plants with 12 to 15 bulbs, 3 leads	1 1 0
1799	,, Specimen plant with 14 bulbs, 4 of which are leads	1 11 6
1800	Micholitzianum. Good plants with 5 to 7 bulbs, 2 leads	3 3 0

BULBOPHYLLUM.

Nos.		Each. £ s. d.
1801	multiflorum. Splendid plant with 5 bulbs, 1 of which is a lead	1 1 0
1802	neilgherense. Magnificent plants with 4 to 6 bulbs, 1 strong lead	10 6
1803	nudiscarpum. Splendid plant with 7 bulbs, 1 of which is a lead	1 1 0
1804	Pechei. Very fine plants with 12 to 15 bulbs, 3 and 4 leads	15 0
1805	Reinwardtii. Splendid plant with 5 bulbs, and making a strong new growth ..	2 2 0
1806	,, Very fine plant with 10 bulbs, well leaved, 2 of which are very fine leads	5 5 0
1807	Rothschildianum. Good plant with 9 bulbs, 2 leads	3 3 0
1808	rufinum Good plants with 5 to 7 bulbs, 1 lead	10 6
1809	,, **aureum.** Magnificent plants with 4 to 6 bulbs, 1 lead..	10 6
1810	saltatorium **affine.** Good plants with 4 to 6 bulbs, 1 of which is a lead	1 11 6
1811	,, ,, Strong plants with 7 and 8 bulbs, 2 of which are leads ..	3 3 0
1812	saurocephalum. Grand plant with 6 bulbs, 1 of which is a lead	10 6
1813	,, Fine plants with 10 to 15 bulbs, 3 and 4 leads	1 1 0
1814	,, Magnificent plant with 21 bulbs, 3 of which are leads	3 3 0
1815	Sillemianum. Nice plant with 4 bulbs, 1 of which is a lead	1 1 0
1816	virescens. Splendid plant with 4 bulbs, 1 fine lead	3 3 0
1817	Watsonianum. Magnificent plants with 12 to 15 bulbs, having several new growths	1 11 6
1818	,, Specimen plant with 35 bulbs, well leaved, with numerous leads	3 3 0

CALANTHE.

1819	Bella. Nice plants with 1 and 2 bulbs..	10 6
1820	Bryan. Fine plants with 1 and 2 bulbs	7 6
1821	,, Stronger plants with 1 and 2 fine bulbs	10 6
1822	Harrisii. Nice plants with 1 bulb	15 0
1823	,, Fine plants with 1 stronger bulb	1 1 0
1824	,, Extra fine plants with 1 grand bulb	1 11 6
1825	Regnieri. Fine plants with 2 and 3 bulbs	10 6
1826	Turneri. Strong plants with 1 and 2 bulbs	7 6
1827	Veitchii. **Fine dark type.** Good plants with 2 and 3 bulbs	5 0
1828	,, Stronger plants with 2 and 3 fine bulbs	7 6
1829	,, **alba.** Good plants with 1 and 2 bulbs	1 1 0
1830	vestita **lutea alba.** Good plants with 1 and 2 bulbs	7 6
1831	,, **rubra.** Nice plants with 1 and 2 bulbs	10 6
1832	William Murray. Fine plants with 1 and 2 good bulbs	7 6
1833	,, ,, Stronger plants with 1 and 2 extra good bulbs	10 6

CHARLESWORTHARA NOBILIS

(ONCIDIUM MACRANTHUM X MILTONIODA AJAX)

A.M. R.H.S. 11/1/1921

CATASETUM.

Nos.			Each. £ s. d.
1834	Bungerothii.	Nice plant with 4 bulbs, and making a new growth	3 3 0
1835	fimbriatum.	Good plants with 3 and 4 bulbs, 1 of which is new	3 3 0
1836	macrocarpum.	Fine plant with 5 bulbs, and making a good new growth	2 2 0
1837	splendens **Lindenii.**	Good plant with 3 bulbs, and making a new growth	5 5 0

CHARLESWORTHARA.

NEW TRIGENERIC HYBRIDS COMBINING MILTONIA, ONCIDIUM AND COCHLIODA SPECIES.

1838	Alpha	(*Miltonioda Ajax*×*Oncidioda Cooksoniæ*) Splendid plant of 5 bulbs, well leaved, and making a strong new growth ..	5 5 0
1839	nobilis	(*Oncidium macranthum*×*Miltonioda Ajax*) Fine plant of 4 bulbs, and making a strong new growth	5 5 0
1840	,,	**A.M. R.H.S.** (see illustration). A remarkable hybrid of a rich chocolate red, with a yellow margin. Flowers of good size, on a spike much reduced by the combination of the three parents. Magnificent plant with 3 bulbs, all leaved, and making a very strong new growth ..	15 15 0
1841	CHONDROPETALUM Fletcheri	(*Chondroryncha Chestertonii*×*Zygopetalum Mackayi*) Fine plant with 3 bulbs, 1 of which is a lead ..	5 5 0
1842	CHONDRORYNCHA Chestertonii.	Fine plant with 1 strong growth, and making a new one	5 5 0
1843	CHYSIS	aurea. Fine plant with 5 bulbs, 1 of which is a lead	1 11 6
1844	,,	bractescens. Good plants with 4 and 5 bulbs, 1 of which is a lead	1 11 6
1845	,,	,, Stronger plant with 5 fine bulbs, 1 of which is a lead ..	2 2 0
1846	,,	langleyensis. Splendid plant with 6 bulbs, 1 of which is a lead	2 2 0
1847	CIRRHŒA	saccata **viridissima.** Nice plants with 4 bulbs, 1 of which is a lead ..	2 2 0
1848	,,	viridi-purpurea. Good plant with 3 bulbs, 1 lead	2 12 6

CIRRHOPETALUM.

1849	Amesianum.	Fine plants with 7 to 9 bulbs, 2 leads	10 6
1850	,,	Extra fine plants with 12 bulbs, 3 leads	1 1 0
1851	appendiculatum.	Splendid plants with 7 to 9 bulbs, 2 of which are leads	1 11 6
1852	Collettii.	Grand plant with 6 bulbs, 3 of which are leads	1 5 0

CIRRHOPETALUM.

Nos.		Each. £ s. d.
1853	gamosephalum. Fine healthy plants with 5 to 7 bulbs, 2 leads	2 2 0
1854	Makoyanum. Small plant with 4 bulbs, 1 of which is a lead	1 1 0
1855	Medusæ. Nice plant of 4 bulbs, and making 1 new growth	2 2 0
1856	mysorensis. Fine plant with 12 bulbs, 3 of which are leads	1 11 6
1857	ornatissimum. Strong plants with 7 to 9 bulbs, 2 leads	1 1 0
1858	,, **superbum.** Magnificent plant with 9 bulbs, 2 of which are leads ..	3 3 0
1859	picturatum. Good plant with 4 bulbs, 1 of which is a lead	1 1 0
1860	,, **Veitch's var.** Nice healthy plant with 3 bulbs, 1 of which is a lead ..	2 2 0
1861	pulchrum **Cliftonii. F.C.C. R.H.S.** Fine plant with 6 bulbs, 2 leads..	5 5 0

COCHLIODA.

1862	miniata .. .. (*Noezliana*×*vulcanica*) Good plants with 4 to 6 bulbs, 1 fine lead	1 1 0
1863	Noezliana. Fine plants with 4 to 6 bulbs, 1 lead	7 6
1864	,, Stronger plants with 7 to 9 bulbs, 2 of which are leads	12 6
1865	,, **Good var.** Nice plant with 5 bulbs, and making 2 strong new growths	1 1 0
1866	,, **Specially fine var.** Splendid plant with 10 bulbs, 3 of which are leads	3 3 0
1867	sanguinea. Good plants with 5 to 7 bulbs, 2 of which are leads	1 1 0
1868	CŒLIA Baueriana. Splendid plant with 7 bulbs, 2 of which are leads	1 1 0

CŒLOGYNE.

1869	barbata. Fine plants with 4 to 6 bulbs, 2 leads	1 1 0
1870	Brymeriana .. .. (*Lowii*×*Dayana*) Splendid plants with 6 to 8 bulbs, 1 and 2 fine leads	10 6
1871	burfordense .. .. (*pandurata*×*asperata*) Fine plants with 4 gigantic bulbs, 2 of which are leads	1 11 6
1872	,, Extra fine plant having 11 magnificent bulbs, 3 of which are fine leads	3 3 0
1873	corrugata. Fine plants of 8 to 10 bulbs, 3 and 4 leads	2 2 0
1874	,, **majus.** Splendid plant with 9 bulbs, 2 leads	1 1 0
1875	cristata. Good plants with 15 to 20 bulbs, and several new leads	10 6
1876	elata. Nice plant with 6 bulbs, 1 of which is a lead	10 6
1877	Ericssonii. Fine plants with 4 to 6 bulbs, 1 is a fine lead	1 1 0
1878	graminifolia. Good plants with 9 to 12 bulbs, 2 and 3 leads	7 6

CŒLOGYNE.

Nos.		Each £ s. d.
1879	lactea. Good plants with 5 to 7 bulbs, 2 of which are leads	7 6
1880	Lawrenceana. Splendid plants with 5 to 7 bulbs, 2 leads	1 11 6
1881	lentiginosa. Good plants with 7 to 10 bulbs, 2 of which are good leads	7 6
1882	Massangeana. Fine plants with 9 to 12 bulbs, 2 and 3 leads	1 1 0
1883	,, Good plants with 12 to 15 bulbs, 3 and 4 leads	2 2 0
1884	Meyeriana. Nice plants with 5 to 7 bulbs, 3 of which are leads	15 0
1885	Micholitzii. Small plant with 3 bulbs, 1 lead	3 3 0
1886	pandurata. Fine plant with 4 bulbs, 1 of which is a lead	2 2 0
1887	plantaginea. Good plant with 10 bulbs, 2 of which are leads	15 0
1888	Rossiana. Magnificent plants with 5 to 7 bulbs, 2 of which are leads	10 6
1889	,, Very fine plant with 9 bulbs, and having 5 leads	1 1 0
1890	Sanderæ. Good plants with 4 to 6 bulbs, 1 of which is a lead	1 1 0
1891	,, Fine plants with 5 to 7 bulbs, 2 leads	1 11 6
1892	,, Extra fine plant with 13 bulbs, 4 leads	2 12 6
1893	sparsa. Nice plant with 4 bulbs, and making a strong new growth	10 6
1894	speciosa **majus.** Splendid plants with 7 to 9 bulbs, 2 and 3 good leads	7 6
1895	,, ,, Specially fine plants with 9 to 12 bulbs, 3 extra fine leads	1 1 0
1896	sumatrana. Very fine plant with 7 bulbs, 2 of which are leads	1 1 0
1897	Swaniana. Fine plants with 4 to 6 bulbs, 1 of which is a lead	2 2 0
1898	tomentosa. Very fine plants with 9 to 12 bulbs, 3 leads	15 0
1899	Veitchii. Fine plant with 6 bulbs, 1 of whch is a good lead	2 12 6
1900	CRYPTOPHORANTHUS Dayanus. Good plant with 20 to 30 leaves	2 2 0
1901	CYCNOCHES chlorochilon. Good plant with 2 bulbs, and 1 new growth	3 3 0
1902	CYNORCHIS Lowii. Splendid plants with 4 to 6 growths	1 11 6

DENDROBIUM.

1903	acuminatum. Nice plants with 4 to 6 bulbs, 1 and 2 leads	1 11 6
1904	Bancroftianum (Very rare). Fine plant with 6 bulbs, 1 lead	2 12 6
1905	chrysanthum. Fine plant with 22 bulbs, 3 of which are leads	10 6
1906	cœlogyne. Splendid plants with 7 to 9 bulbs, 2 leads	1 1 0
1907	cymbidioides. Good plants with 9 to 12 bulbs, 2 and 3 leads	10 6
1908	densiflorum. Splendid plants with 5 to 7 bulbs, 1 and 2 leads	15 0
1909	fimbriatum. Magnificent plants with 5 to 7 bulbs, 1 is a strong lead	1 1 0
1910	formosum **giganteum.** Nice plants with 5 to 7 bulbs, 1 and 2 leads	10 6
1911	infundibulum. Fine plants with 5 to 7 bulbs, 1 lead	10 6
1912	,, Stronger plants with 9 to 12 bulbs, 2 leads	1 1 0

DENDROBIUM.

Nos.		Each. £ s. d.
1913	Jamesianum. Good plants with 5 to 7 bulbs, 1 lead	15 0
1914	japonicum. Very fine plant with 25 bulbs, several are leads	1 1 0
1915	Juno. Nice plants with 5 to 7 bulbs, 1 and 2 leads	7 6
1916	Kingianum. Exceptional specimen in basket, measuring 12 in. × 12 in. × 5½ in. having between 400 and 500 bulbs, many of which are good flowering leads	5 5 0
1917	,, **album.** Fine plants with 5 to 7 bulbs, 1 is a strong lead	1 1 0
1918	nobile. Good plants with 5 to 7 bulbs, 1 lead	5 0
1919	,, **nobilius.** Splendid plants with 5 to 7 bulbs, 1 lead	15 0
1920	,, ,, Stronger plants with 5 to 7 fine bulbs, 1 lead	1 1 0
1921	,, **virginale.** Good plants with 9 to 12 bulbs, 1 and 2 leads..	10 6
1922	phalænopsis **Schroderianum** (*newly imported, semi-established plants*) Nice plants with 3 and 4 bulbs, 1 lead	10 6
1923	,, ,, Stronger plants with 3 and 4 extra fine bulbs, 1 lead ..	15 0
1924	,, ,, Extra fine plants with 4 to 6 extra strong bulbs, 1 lead	1 1 0
1925	,, **hololeucum.** Nice plant with 5 bulbs, 1 of which is a lead	5 5 0
1926	Schroderæ. Fine plant with 7 bulbs, 1 lead	1 11 6
1927	thrysiflorum. Good plants with 5 to 7 bulbs, 1 fine lead	10 6
1928	Wardianum. Fine plants with 5 to 7 bulbs, 1 of which is a lead	7 6
1929	,, **album.** Nice plant with 4 bulbs, 1 of which is new	3 3 0
1930	EPI-CATTLEYA guatemalensis. Splendid plant with 7 bulbs, 1 of which is a strong lead	1 11 6

EPIDENDRUM.

1931	arachnoglossum **candidum.** Magnificent plant of 5 strong bulbs, about 4 feet in height, well leaved, and having 1 strong lead ..	3 3 0
1932	aromaticum. Small plant with 4 bulbs, 1 of which is a lead	10 6
1933	Boundii .. .. (*radicans*×*Burtonii*) Fine plants with 7 to 10 growths	2 2 0
1934	costaricaensis. Good plant with 10 bulbs, 3 of which are leads	15 0
1935	Lionetianum. Nice plant with 5 bulbs, 1 of which is a lead	1 11 6
1936	prismatocarpum. Good plant with 8 bulbs, 2 of which are leads	1 1 0
1937	radicans. Fine plants with 6 to 8 growths	1 11 6
1938	rigidum. Nice plant with 6 bulbs, 2 of which are leads	10 6
1939	vitellinum **majus.** .. .. (*Autumn flowering var.*) Good plants with 5 to 7 bulbs, 1 lead	10 6
1940	,, ,, ... (*Autumn flowering var.*) .. Fine plants with 9 to 12 bulbs, 2 leads	1 1 0

EPIDENDRUM.

Nos.		Each. £ s. d.
1941	vitelinum **majus** .. .. (*Summer flowering var.*) Nice plants with 5 to 7 bulbs, 1 lead	10 6
1942	,, ,, ... (*Summer flowering var.*) Fine plants with 9 to 12 bulbs, 2 leads	15 0
1943	ERIA barbata. Splendid plant with 3 fine bulbs, and making 2 strong leading growths	15 0
1944	,, stellata. Strong plants with 9 to 12 bulbs, 2 and 3 leads	10 6
1945	ERIOPSIS rutidobulbon. Good healthy plants with 4 to 6 bulbs, 1 and 2 leads ..	2 2 0
1946	EULOPHIA majestrifolia. Good plants with 4 and 5 bulbs, 1 of which is a fine lead	1 11 6
1947	EULOPHIELLA Elizabethæ. Good plant with 2 leaved growths, and 1 new growth	5 5 0
1948	,, Rolfei .. .. (*Elizabethæ* × *Peetersiana*) Healthy plant with 2 bulbs, 1 of which is a strong lead ..	5 5 0
1949	,, ,, Splendid plant with 2 fine bulbs, well leaved, and making an extra strong new growth	7 17 6
1950	GOMEZA planifolia. Good healthy plants with 4 and 5 bulbs, 1 of which is a lead	10 6
1951	GONGORA quinquenervis. Good plants with 4 to 6 bulbs, 1 lead	4 4 0
1952	GOODYERA secundiflora. Nice healthy plants with 2 and 3 well leaved growths	10 6
1953	HABENARIA rhodochila. Good plants with 2 and 3 tubers	1 1 0
1954	,, ,, Stronger plants with 4 to 6 tubers	1 11 6
1955	HOULLETIA Brocklehurstiana. Nice plant with 6 bulbs, 1 of which is a lead ..	2 12 6
1956	LEPTOTES bicolor. Nice healthy plant with 9 growths, 2 of which are new ..	1 1 0
1957	LIPARIS pendula. Good healthy plants of 9 to 12 bulbs, 2 of which are new ..	7 6

LYCASTE.

1958	aromatica. Good plants with 7 to 9 bulbs, 2 leads	10 6
1959	Deppei. Nice plants with 2 and 3 bulbs, 1 of which is a lead	10 6
1960	gigantea. Magnificent plant with 4 very fine bulbs, and making 2 new growths ..	1 1 0
1961	hybrida. (Natural hybrid) .. .. (*L. Deppei* × *L. Skinneri*) Splendid plant with 5 bulbs, 1 lead	3 3 0

LYCASTE.

Nos.		Each. £ s. d.
1962	hybrida. **Fine variety.** Very fine plant with 4 bulbs, and making 2 new growths	5 5 0
1963	leucantha. Good plants with 4 fine bulbs, and making a strong new growth.. ..	10 6
1964	lasioglossa. Nice plant with 5 bulbs, 1 of which is a lead	2 2 0
1965	macrobulbon **Youngii.** Good plant with 4 bulbs, and making a strong new growth	1 1 0
1966	Mary Gratrix .. .. (*Skinneri*×*macrophylla*) Very fine plant with 5 bulbs, 1 lead	5 5 0
1967	Skinneri. Good plants with 4 to 6 bulbs, 1 and 2 leads	7 6
1968	,, **alba.** Nice healthy plant with 3 bulbs, and making a strong new growth	4 4 0
1969	,, ,, **Fine variety.** Very good plant with 6 bulbs, 1 strong lead ..	5 5 0
1970	xytriophora. Splendid plant with 4 bulbs, and making a strong new growth ..	10 6

MASDEVALLIA.

1971	abbreviata. Fine plants with 9 to 12 leaves	10 6
1972	amabilis. Nice healthy plants with 7 to 9 leaves	10 6
1973	Barleana. Very nice plants with 10 to 12 leaves	7 6
1974	calura. Good plants with 9 to 12 leaves	10 6
1975	Chestertonii. Fine plants with 20 to 25 leaves	1 11 6
1976	chimæra. Nice plants with 15 to 20 leaves	2 2 0
1977	demissa Good plants with 6 to 9 leaves	7 6
1978	Gaskelliana. Fine healthy plants with 15 to 20 leaves	12 6
1979	Harryana. Nice plants with 15 to 20 leaves	7 6
1980	,, **Leyswood var.** Fine plants with 9 to 12 leaves	1 1 0
1981	,, **lilacina.** Nice plants with 9 to 12 leaves	7 6
1982	,, **Lindenii.** Good healthy plants with 12 to 15 fine leaves	7 6
1983	,, **maxima.** Good healthy plants with 9 to 12 leaves..	7 6
1984	,, **purpurea.** Fine plants with 6 to 9 leaves	7 6
1985	,, **sanguinea.** Good plants with 12 to 15 leaves	10 6
1986	,, **violacea.** Nice plants with 9 to 12 leaves	7 6
1987	ignea. Good plants with 12 to 15 leaves	7 6
1988	,, **Massangeana.** Fine plants with 9 to 12 leaves	10 6
1989	,, **Stobartiana.** Good plants with 12 to 15 leaves	10 6
1990	melanopus. Fine plants with 12 to 15 leaves	7 6
1991	muscosa. Grand plants with 30 to 40 leaves	7 6
1992	Reichenbachiana. Nice plants with 12 to 15 leaves	10 6
1993	Schlimii. Good plants with 12 to 15 fine leaves	7 6
1994	Schroderiana. Fine plants with 15 to 20 leaves	7 6

MASDEVALLIA.

Nos.		Each. £ s. d.
1995	Shuttleworthii. Good plant with 11 leaves	1 11 6
1996	simula. Good healthy plants with 25 to 30 leaves	5 0
1997	torta. Fine plants with 15 to 20 leaves	5 0
1998	tovarensis. Good plants with 12 to 15 leaves	5 0
1999	triangularis. Fine plants with 9 to 12 leaves	10 6
2000	tridactylites. Nice plants with 30 to 40 leaves	5 0
2001	Troglodytes. Fine plants with 9 to 15 leaves	7 6
2002	Veitchiana. Good healthy plants with 9 to 12 leaves	10 6
2003	,, **grandiflora.** Fine plants with 9 to 12 leaves	15 0
2004	velifera. Nice plant with 4 leaves	1 11 6
2005	Wageneriana. Good plants with 15 to 20 leaves	10 6

MASDEVALLIA HYBRIDS.

2006	Ajax .. .. (*Chelsonii*×*peristeria*) Fine plants with 12 to 15 leaves	7 6
2007	Bocking hybrid .. .. (*cucullata*×*Veitchiana*) Good plants with 8 to 10 leaves	10 6
2008	Courtauldiana .. .. (*rosea*×*caudata*) Very fine plants with 15 to 20 leaves	10 6
2009	Curlei .. .. (*macrura*×*tovarensis*) Good healthy plants with 9 to 12 leaves	7 6
2010	falcata .. .. (*Lindenii*×*Veitchiana*) Grand plants with 12 to 15 leaves..	7 6
2011	Imogene .. .. (*Schlimii*×*Veitchiana*) Fine plants with 9 to 12 leaves	7 6
2012	McVittiæ .. .. (*tovarensis*×*coccinea*) Nice plant with 8 leaves	10 6
2013	Measuresiana .. .. (*amabilis*×*tovarensis*) Grand plants with 12 to 15 leaves	5 0

MAXILLARIA.

2014	meleagris. Fine plants with 7 to 10 bulbs, 3 and 4 leads	7 6
2015	,, Specimen plant with 40 bulbs, 15 leads	1 1 0
2016	nigrescens. Good plants with 5 to 7 bulbs	10 6
2017	,, Specimen plant having 16 bulbs, 6 leads	1 1 0
2018	picta. Nice plants with 5 and 6 bulbs, 1 and 2 leads	10 6

MAXILLARIA.

Nos.		Each £ s. d.
2019	Sanderiana. Fine plants with 4 and 5 bulbs, 1 and 2 leads	15 0
2020	,, Stronger plants with 5 to 7 bulbs, 3 and 4 leads	1 11 6
2021	,, Grand specimen with 11 bulbs, 5 leads	3 3 0
2022	tenuifolia. Good plants with 15 to 20 bulbs, 5 and 6 good leads	7 6
2023	,, Stronger plants with 25 to 30 bulbs, 8 and 9 leads	15 0
2024	venusta. Nice plants with 4 and 5 bulbs, 1 strong lead	10 6
2025	MEGACLINIUM falcatum. Good healthy plants with 4 to 6 bulbs, 1 and 2 leads	1 11 6
2026	,, Imschootianum. Good plants with 4 to 6 bulbs, 1 lead	5 5 0
2027	MICROSTYLIS commelynifolia. Nice plants with 4 to 6 growths	15 0
2028	,, lugubris-flava. Fine plant with 2 bulbs	1 1 0
2029	NANODES Medusæ. Good plant with 6 well leaved growths, 3 of which are new ..	2 2 0
2030	,, ,, Splendid plant with 10 well leaved growths, 5 of which are new	4 4 0
2031	NEMOOREA irrorata. A fine plant of 4 bulbs, well leaved, 1 strong lead	4 4 0
2032	,, ,, Magnificent specimen with 4 gigantic well leaved bulbs, and making 2 strong new growths	7 7 0
2033	OCTOMERIA diaphana. Good plants of 9 to 12 growths, 3 and 4 of which are new	15 0
2034	,, Glazouxiana. Fine plants of 12 to 15 growths, well leaved	10 6
2035	,, ,, Stronger plants of 20 to 25 growths	1 1 0

ONCIDIUM.

2036	auriferum. Nice plant with 7 bulbs, 1 of which is a lead	1 1 0
2037	aurosum. Good plants with 6 to 8 bulbs, 2 and 3 leads	1 1 0
2038	cheirophorum. Fine plants with 7 to 9 bulbs, 3 and 4 leads	10 6
2039	,, Stronger plants with 9 to 12 bulbs, 5 and 6 leads	1 1 0
2040	,, Very fine plants with 15 to 20 bulbs, 9 to 12 leads	2 2 0
2041	corynephorum. Good plant on raft, having 3 bulbs, and making a strong new growth	5 5 0
2042	,, Extra fine plant with 3 strong bulbs, and making a strong new growth	7 7 0
2043	cucullatum. Good plants with 4 to 6 bulbs, 1 lead	15 0
2044	graminifolium. Nice plants with 4 to 6 bulbs, 1 lead	10 6
2045	hybridum .. .. (*tigrinum*×*lamelligerum*) Nice plant of 5 bulbs, 1 lead	1 1 0

ONCIDIUM.

Nos.		Each. £ s. d.
2046	incur-nephorum .. .. (*incurvum* × *corynephorum*) Fine plants with 3 and 4 bulbs, 1 strong lead	3 3 0
2047	incurvum. Good plants with 4 to 6 bulbs, 1 and 2 leads	7 6
2048	,, Stronger plants with 6 to 9 bulbs, 2 leads	10 6
2049	,, **album.** Fine plant with 4 bulbs, 1 lead	1 1 0
2050	,, ,, Stronger plant with 4 bulbs, 1 extra fine lead	1 11 6
2051	insculptum. Nice plant having 3 bulbs, 1 lead	1 1 0
2052	lamelligerum. Fine plant of 3 bulbs, 1 of which is a lead	1 11 6
2053	macranthum. Good plants with 3 and 4 bulbs, 1 lead	15 0
2054	,, Splendid plants with 4 to 6 bulbs, 1 extra strong lead	1 11 6
2055	maculatum. Nice plant having 4 bulbs, 1 lead	10 6
2056	McBeanianum .. .. (*superbiens* × *macranthum*) Good plants with 4 and 5 bulbs, 1 strong lead	1 1 0
2057	,, Larger plants with 5 and 6 bulbs, 1 lead	2 2 0
2058	monachicum, var. **metallicum.** A very rare and handsome Oncidium. Fine plant with 4 bulbs, 1 lead	7 7 0
2059	oblongatum. Good plants with 3 and 4 bulbs, 1 lead	1 1 0
2060	,, Splendid plant having 5 gigantic bulbs, 1 extra strong lead	2 2 0
2061	ornithorrynchum. Fine plants with 3 and 4 bulbs, 1 strong lead	10 6
2062	,, **album.** Nice plants of 3 bulbs, and making a new growth ..	1 11 6
2063	Papilio. Fine plants with 4 bulbs, 1 of which is a lead	10 6
2064	,, **Charlesworthii.** A distinct variety; one of which received an Award of Merit at the Chelsea Show, 1921. Long incurved sepals of greenish yellow, the showy petals and lip of a dark orange yellow on a paler ground suggest a new species. Good plant having 6 bulbs, 1 lead	3 3 0
2065	,, **Sanderæ.** Fine plant having 6 bulbs, 1 lead	2 2 0
2066	phymatochilum. Good plant with 4 bulbs, 1 lead	2 2 0
2067	Wentworthianum. Fine plants with 4 to 6 bulbs, 1 lead	15 0
2068	ORNITHIDIUM coccineum. Nice plants with 2 and 3 bulbs, and making 2 new growths	1 1 0
2069	,, sophronitis. Fine plant in 6-inch pan	3 3 0
	PACHYSTOMA (syn. Ancistrochilus).	
2070	PERISTERIA elata. Splendid plant of 4 extra fine bulbs, 1 of which is a strong lead	2 2 0
2071	PHAIO-CALANTHE Arnoldiæ .. (*Calanthe Regnieri* × *Phaius grandifolius*) Good plant of 2 bulbs, and making 2 new growths ..	1 11 6
2072	PHAIO-CYMBIDIUM chardwarense .. (*P. grandifolius* × *C. giganteum*) Good healthy plants with 4 to 6 bulbs, 1 fine lead	3 3 0
2073	,, ,, ,, An extra strong plant of 8 bulbs, and making a vigorous new growth ..	5 5 0

PHAIUS.

Nos.			Each. £ s. d.
2074	amboinensis.	Fine plant with 2 strong bulbs, and making a vigorous new growth	2 2 0
2075	Ashworthianus	(*Mannii*×*maculatus*) Good plant of 4 bulbs, 1 of which is a strong lead	2 2 0
2076	Clive	(*Norman*×*simulans*) Healthy plants with 3 and 4 bulbs, 1 of which is a lead	3 3 0
2077	flavus.	Good plants with 3 and 4 bulbs, 1 lead	1 1 0
2078	,,	Stronger plants with 3 and 4 extra strong bulbs, 1 lead	1 11 6
2079	hybridus.	(*grandifolius*×*Wallichii*) Good plants with 3 and 4 bulbs, 1 strong lead	1 1 0
2080	Marthæ	(*Blumei*×*simulans*) Fine plants with 3 and 4 bulbs, 1 strong lead	2 2 0
2081	,,	Extra strong plants of 3 and 4 fine bulbs, 1 lead	3 3 0
2082	Norman	(*Sanderianus*×*simulans*) Nice plants with 3 and 4 bulbs, 1 good lead	1 11 6
2083	,,	Stronger plant with 4 bulbs, 1 lead	2 2 0
2084	Sanderianus.	Very fine plants with 4 to 6 bulbs, 1 lead	1 11 6
2085	PHALÆNOPSIS Esmeralda.	Good healthy plants with 1 growth, 4 and 5 leaves	15 0
2086	,, ,,	Extra fine plants with 2 strong growths, 4 and 5 leaves each	1 11 6
2087	,, ,,	**dark variety.** Fine plant of 2 growths, 5 leaves each	2 2 0
2088	,, Schilleriana.	Nice healthy plants with 2 and 3 leaves	1 1 0
2089	,, ,,	Stronger plants with 3 fine leaves	1 11 6
	PILUMNA (see Trichopilia).		
2090	PLATYCLINIS Cobbiana.	Good healthy plants of 9 to 12 bulbs, 2 and 3 are new	10 6
2091	,, filiformis.	Small healthy plants of 9 to 12 bulbs, 3 are new	15 0
2092	,, glumacea.	Splendid plants of 9 to 12 bulbs, 3 and 4 are new ..	10 6
2093	,, latifolia.	Nice plants of 12 to 15 bulbs, 4 and 5 are new	10 6
2094	,, uncata.	Fine plants of 12 to 15 bulbs, 5 and 6 are new	7 6
2095	PLEIONE humilis.	Good plant in 4 inch pan, having 10 bulbs, 5 of which are new	1 1 0
2096	PLEUROTHALLIS Birchenallii.	Strong healthy plants with 9 to 12 well leaved growths, 3 are new	1 1 0
2097	,, diaphana.	Fine plants of 12 growths, 3 are new	15 0
2098	,, Roezlii.	Good plants with 6 to 8 well leaved growths, 2 and 3 are new	10 6
2099	,, ,,	Stronger plants with 10 to 12 growths, 3 and 4 are new	1 1 0
2100	,, tridentata.	Nice healthy plant of 15 growths, 5 are new ..	1 1 0

Nos.			Each. £ s. d.
2101	PROMENÆA citrina.	Good plants with 12 to 15 bulbs, 4 to 6 leads	3 3 0
2102	RENANTHERA Imschootiana.	Nice healthy plants with 1 stem, 5 and 6 pairs of leaves	10 6
2103	,, ,,	Stronger plants with 7 and 8 pairs of leaves ..	15 0
2104	RESTREPIA antennifera.	Fine plants with 9 to 12 well leaved growths	10 6
2105	,, ,,	Stronger plants with 12 to 15 well leaved growths ..	15 0
2106	,, maculata.	Good healthy plants with 8 to 12 well leaved growths ..	15 0
2107	,, striata.	Nice plant with 6 growths, 2 are new	15 0
2108	,, ,,	Stronger plant with 15 fine leaved growths, 4 are new ..	1 1 0
2109	SACCOLABIUM ampullaceum.	Nice healthy plant with 3 leaves..	1 1 0
2110	,, Blumei.	Good healthy plants with 3 and 4 leaves	1 11 6
2111	,, giganteum.	Good plants having 4 and 5 leaves	1 1 0
2112	,, Harrisonianum.	Small healthy plant with 3 leaves	1 1 0
2113	SARCOCHILUS canaliculatus.	Small healthy plant with 4 leaves	1 1 0
2114	,, Fitzgeraldii.	Good healthy plants with 3 and 4 well leaved growths	15 0
2115	,, Hartmannii.	Fine plants with 4 and 5 well leaved growths ..	15 0
2116	,, ,,	Stronger plants with 5 to 7 well leaved growths ..	1 1 0
2117	,, teres.	Small healthy plant with 2 well leaved growths	1 11 6
2118	SCHOMBOLÆLIA tibibrosa	(*L. tenebrosa*×*S. tibicinis*) Good healthy plant with 6 well leaved bulbs, 1 lead ..	4 4 0
2119	SCHOMBURGKIA Humboldtii.	Strong healthy plant with 7 well leaved bulbs, 1 lead	2 2 0
2120	,, tibicinis.	Fine plant with 6 well leaved bulbs, 1 strong lead	2 12 6
2121	SCUTICARIA Hadwenii.	Fine plants having 6 to 8 bulbs, 1 lead	1 1 0
2122	SIGMATOSTALIX radicans.	Nice healthy plants with 6 to 8 bulbs, 4 are new	1 11 6

SOBRALIA.

2123	Charlesworthii.	**F.C.C. R.H.S.** A very fine Sobralia, with deep rose-coloured sepals and petals and a broad band of purple round the lip, which has a yellow crest. Healthy plant of 2 fine reeds, and making 1 new	10 10 0

SOBRALIA.

Nos.		Each. £ s. d.
2124	Colmanii .. .. (*Veitchii* × *xantholeuca concolor*) Fine plants with 7 to 10 reeds, 2 of which are new	1 1 0
2125	,, Stronger plants with 12 to 15 fine reeds, 5 of which are new	1 11 6
2126	Duquesna. Fine plant with 5 reeds, 3 are new	1 1 0
2127	Lucasiana. Small healthy plants with 3 and 4 reeds	10 6
2128	Lyoth .. .. (*macrantha* × *Charlesworthii*) Fine plant of 8 reeds, 3 are new	2 2 0
2129	,, **A.M. R.H.S.** Splendid plant with 7 reeds, 4 are new	5 5 0
2130	macrantha. Nice healthy plants with 5 to 7 reeds, 1 and 2 are new	10 6
2131	,, **alba.** Grand plant of 7 reeds, 2 of which are new	2 2 0
2132	Ruckeri. Healthy plants with 5 to 7 reeds, 2 are new	10 6
2133	Veitchii .. .. (*macrantha* × *xantholeuca*) Good plants with 9 to 12 reeds, 2 and 3 of which are new	1 1 0
2134	xantholeuca. Fine strong plant with 8 reeds, 3 are new	1 11
2135	SOPHRONITIS cernua. Grand plant of 7 bulbs, 2 leads	10 6
2136	,, grandiflora. Fine plants with 9 to 12 bulbs, 2 and 3 leads ..	10 6
2137	,, ,, Stronger plants with 12 to 15 bulbs, 5 and 6 leads ..	15 0
2138	,, ,, Very fine plants with 15 to 20 bulbs, 6 and 7 leads ..	1 1 0
2139	,, ,, **Fine variety.** Splendid plant of 22 bulbs, 6 leads ..	1 11 6
2140	SPATHOGLOTTIS aureo-Vieillardii .. .. .. (*aurea* × *Vieillardii*) Strong healthy plants of 2 and 3 bulbs, one is new ..	1 11 6
2141	,, kewensis .. .. (*plicata Micholitzii* × *Viellardii*) Good plant with 4 bulbs, 1 lead	1 11 6
2142	,, plicata. Nice healthy plant of 2 bulbs, 1 is new	10 6

STANHOPEA.

2143	Amesiana. Good healthy plants of 5 bulbs, 1 lead	1 11 6
2144	convoluta. Fine plant having 6 bulbs, 1 lead	4 4 0
2145	eburnea. Nice plant with 6 bulbs, 1 lead	10 6
2146	graveolens. Splendid plant having 5 bulbs, and making 1 strong new lead	2 2 0
2147	oculata. Very fine plant of 5 bulbs, 1 good lead	1 1 0
2148	platyceras. Fine plant with 4 bulbs, 1 lead	1 11 6
2149	,, Extra good plant with 6 fine bulbs, 1 lead	2 2 0
2150	tigrina. Good plant with 6 bulbs, 1 strong lead	1 1 0
2151	STENOGLOTTIS longifolia. Good healthy plants with 5 to 7 growths	10 6
2152	TAINIA penangeana. Fine healthy plants with 3 and 4 bulbs, 1 lead	10 6

THUNIA.

Nos.			Each £ s. d.
2153	Brymeriana.	Fine plants of 2 and 3 strong stems, 1 is new	10 6
2154	,,	Stronger plants of 3 and 4 extra fine stems, 2 are new	1 1 0
2155	Marshalliana.	Good plants with 2 stems, 1 is new	7 6
2156	,,	Stronger plants with 2 and 3 fine stems, 1 is new	10 6
2157	Veitchiana.	Fine plants with 2 good stems, 1 is new	10 6
2158	,,	Stronger plants with 4 fine stems, 2 are new	15 0
2159	,,	**alba.** Fine plant with 2 stems, 1 is new	1 1 0

TRICHOPILIA.

(syn. Pilumna).

2160	Backhouseana.	Fine healthy plants with 4 and 5 bulbs, 1 lead	10 6
2161	,,	Stronger plants with 4 and 5 fine bulbs, 1 lead	15 0
2162	,,	Extra fine plants with 5 to 7 bulbs, 1 and 2 leads	1 1 0
2163	coccinea.	Fine healthy plants with 4 and 5 good bulbs, 1 lead	15 0
2164	crispa.	Small healthy plants with 4 and 5 bulbs, 1 lead	10 6
2165	fragrans.	Nice plants with 4 and 5 bulbs, 1 lead	15 0
2166	Gouldii	.. .. (*suavis*×*fragrans*) Strong healthy plants with 4 to 6 bulbs, 1 lead	1 11 6
2167	,,	Stronger plants with 5 to 7 bulbs, 1 extra strong lead	2 2 0
2168	,,	**A.M. R.H.S.** Very fine plant with 6 well leaved bulbs, and making 1 strong new growth	3 3 0
2169	Lehmannii.	Splendid plant with 5 good bulbs, 1 lead	1 1 0
2170	nobilis.	Nice plants with 4 and 5 bulbs, 1 lead	15 0
2171	suavis.	Small healthy plant with 6 bulbs, 1 lead	15 0
2172	tortilis.	Very fine plants with 7 to 9 bulbs, 3 leads	10 6
2173	,,	Stronger plants with 9 to 12 bulbs, 4 leads	15 0
2174	TRICHOSMA suavis.		Fine healthy plants with 5 and 6 well leaved growths ..	10 6
2175	,,	,,	Stronger plants with 7 to 9 extra fine growths	1 1 0

VANDA.

2176	Agnes Joacquim	.. .. (*teres*×*Hookeriana*) Good plants with stem 12 to 15-inches high, having 9 to 12 leaves	10 6
2177	,, ,,	Stronger plants with stem 2 ft. to 2 ft. 6 inches high, 10 to 14 leaves	15 0
2178	,, ,,	Very fine plants with stem about 4 ft. high, well leaved ..	1 1 0

VANDA.

Nos.		Each. £ s. d.
2179	Amesiana. Fine plants with 1 well leaved growth	10 6
2180	cœrulea .. .. (*finest type, unflowered*) Very fine healthy plants with 3 and 4 pairs of leaves	10 6
2181	,, Stronger plants with 4 and 5 pairs of leaves	15 0
2182	,, Fine plants with 6 to 8 pairs of leaves	1 1 0
2183	,, Extra fine plants with 7 to 9 pairs of leaves	1 11 6
2184	,, Splendid specimen with 6 stems, averaging 4 to 8 pairs of leaves	5 5 0
2185	Denisoniana. Fine plant with 4 pairs of leaves	2 2 0
2186	,, Nice plant with 9 leaves	3 3 0
2187	Kimballiana **alba.** Small healthy plants with 4 and 5 leaves	3 3 0
2188	Marguerite Maron .. .. (*teres* × *suavis*) Good healthy plant with 5 pairs of leaves	2 2 0
2189	Parishii **Marriottiana.** Strong plant with 2 pairs of fine leaves	1 11 6
2190	,, ,, Magnificent specimen with 14 gigantic leaves	10 10 0
2191	Sanderiana. Small healthy plants with 3 and 4 leaves	2 2 0
2192	suavis. Strong healthy plants with 4 to 6 pairs of leaves..	10 6
2193	,, Stronger plants with 7 and 8 pairs of leaves	1 1 0
2194	,, Extra fine plants with 10 to 12 pairs of leaves	1 11 6
2195	,, **pallida** .. .. (The albino form) .. Magnificent plant with 11 good leaves	10 10 0
2196	,, **rosefieldensis.** Strong plant with 4 pairs of leaves	2 2 0
2197	,, **Veitchii.** Splendid plant with 6 pairs of leaves	2 12 6
2198	teres. Strong healthy plants about 2 ft. 6 in. high, well leaved	10 6
2199	,, Very fine healthy plants about 4 ft. 6 in. high, well leaved	1 1 0
2200	,, **alba.** Good healthy plant with 5 pairs of leaves	5 5 0
2201	,, **albida.** Fine plant with 8 pairs of leaves..	2 2 0
2202	,, **candida.** Splendid plant with 7 pairs of leaves	5 5 0
2203	,, **gigantea.** Very fine well leaved plants with 10 to 12 pairs of leaves ..	1 11 6
2204	tricolor. Good healthy plants with 4 and 5 pairs of leaves	7 6
2205	,, Stronger plants with 6 and 7 pairs of leaves	10 6
2206	,, Fine plants with 8 and 9 pairs of leaves	1 1 0
2207	,, Specially fine plant having 12 pairs of leaves	2 2 0
2208	,, **insigne.** Splendid plant with 10 pairs of leaves	3 3 0
2209	,, **planilabris.** Good plant with 5 pairs of leaves	1 11 6
2210	,, **superba.** Grand plant with 6 pairs of leaves	1 1 0
2211	,, ,, Splendid specimen with 12 pairs of leaves	2 2 0
2212	,, **tenebrosa.** Fine plants with 6 and 7 pairs of leaves	2 12 6
2213	,, ,, Fine specimen with 9 pairs of leaves	3 3 0
2214	vandarum. Good healthy plants with 4 and 5 pairs of leaves	1 11 6
2215	VANILLA aromatica. Strong plant with 9 leaves	15 0
2216	,, pomona. Splendid plant having 10 leaves	15 0

VUYLSTEKEARA MEMORIA JOSEPH CHARLESWORTH

(ODONTIODA BREWII X MILTONIA CHARLESWORTHII)

F.C.C. R.H.S. 5/10/1920

VUYLSTEKEARA.

These trigeneric hybrids combine Miltonia, Cochlioda and Odontoglossum. In many respects they favour our new section of Odontonias, but having the addition of Cochlioda blood are mostly improved in colour thereby.

The coloured illustration of Vuylstekeara Memoria Joseph Charlesworth conveys some idea of the wonderful colouring which may result from further judicious crossing of these Gems.

Nos.			Each. £ s. d.
2217	Adonis	(*M. Warscewiczii*×*Oda. Madeline*) A strong healthy plant of 4 bulbs, well leaved, 1 lead	5 5 0
2218	Brewii	(*Oda. Brewii*×*M. vexillaria*) A remarkable cross combining the characters of both parents. The Odontioda Brewii giving the rich ruby purple in sepals and petals, and the Miltonia contributing the large lip of a rosy mauve on a white ground. A splendid plant of 3 bulbs, all leaved, and making a strong new growth	26 5 0
2219	,,	**A.M. R.H.S.** An exceptionally fine variety. Sepals and petals of good shape, of rich vinous red, shaded with purple. The large Miltonia like lip is of a rich mauve, closely veined, the colour deepening towards the crest, which is of bright yellow. A nice plant of 3 bulbs, and making 2 new growths	36 15 0
2220	Edna.	(*Miltonioda Harwoodii*×*Oda. Charlesworthii*) A splendid plant of 4 bulbs, all leaved, 1 of which is a strong lead	3 3 0
2221	Eros	(*M. Warscewiczii*×*Oda. Charlesworthii*) A splendid plant of 5 fine bulbs, well leaved, 1 of which is a strong lead	5 5 0
2222	Eva	(*Miltonioda Harwoodii*×*Oda. Brewii*) An extraordinary flower of medium size, combining the colours of both parents. Sepals and petals of solid ruby red, the lip being larger than that of M. Harwoodii, and of a similar colour. A fine plant of 2 bulbs, and making a new growth	15 15 0
2223	Felicia	(*M. Warscewiczii*×*Oda. Felicia*) A splendid plant of 4 strong bulbs, 3 having leaves, 1 of which is a fine lead	3 3 0
2224	ignescens	(*Miltonioda Harwoodii*×*O. Harryanum magnificum* A remarkable flower ; the sepals and petals being of an indian red. Lip of a brick red colour, and of Miltonia Harwoodii shape. A magnificent plant of 3 fine bulbs, all leaved, 1 of which is a splendid lead	10 10 0
2225	**Memoria Joseph Charlesworth**	(*M. Charlesworthii*×*Oda. Brewii*) This is undoubtedly one of the greatest achievements of the hybridists' skill, and a fitting tribute to our late head of the firm. In form it approaches Miltonia, having sepals and petals of a deep maroon crimson, the broad ovate lip being rosy crimson with a yellow crest. Good healthy plant with 3 bulbs, well leaved, 1 lead	36 15 0
2226	,, ,, ,,	**good variety.** A large flower of exceptional brilliance ; colour ruby red, large open lip of rosy crimson, sepals and petals of a rich purple. Magnificent plant with 4 bulbs, well leaved, 1 strong lead	52 10 0
2227	Nestor	(*Oda. Charlesworthii*×*M. Bleuana*) A nice plant of 2 bulbs, and making a strong new growth	5 5 0

VUYLSTEKEARA.

Nos.			Each. £ s. d.
2228	Nora	(*Miltonioda Harwoodii×Oda. Cooksoniæ*) The flower is of a brick red colour, sepals and petals of good shape, the lip being rather paler in colour, and of the Miltonia shape and size. A very fine plant of 3 good bulbs, all with leaves, 1 of which is a very strong lead	10 10 0
2229	ruby	(*Miltonioda Harwoodii×O. Ashworthianum*) A remarkable flower of intense ruby red. Sepals and petals solid in colour, lip of a medium size, resembling Miltonia Harwoodii in shape, and of a rich vinous red. A splendid plant of 4 bulbs, 3 with leaves, 1 of which is a strong lead	10 10 0
2230	Thera	(*M. Warscewiczii×Oda. Cooksoniæ*) A strong plant with 4 bulbs, and making a vigorous new growth	5 5 0
2231	WARSCEWICZELLA discolor.	Small healthy plant with 3 growths	2 2 0
2232	WILSONARA insignis	(*Oncidioda Charlesworthii×Odont. illustrissimum*) Very fine plant with 4 bulbs, well leaved, 1 strong lead	1 11 6
2233	,, majalis ..	(*Oda. Chanticleer×Oncidium corynephorum*) Splendid plant with 4 bulbs, well leaved, and making a strong new growth	5 5 0
2234	XYLOBIUM leontoglossum.	Strong plants with 7 to 9 bulbs, 2 are new	10 6
2235	ZYGO-COLAX Charlesworthii ..	(*Z. Perrenoudii×Colax jugosus*) Good healthy plants with 5 to 7 bulbs, 1 and 2 leads ..	2 2 0
2236	,, Wiganianum ..	(*Z. intermedium×C. jugosus*) Small healthy plant with 2 bulbs, and making a new growth	2 2 0

ZYGOPETALUM.

2237	brachypetalum.	Strong plant with 4 fine bulbs, and making 2 new growths	2 2 0
2238	Brewii	(*Perrenoudii×rostratum*) Splendid plant with 5 bulbs, and making a strong new growth	3 3 0
2239	crinitum	Extra fine plants with 4 and 5 bulbs, well leaved, 1 fine lead	15 0
2240	Lindenii	(*unique plant*) Healthy plant with 2 growths	10 10 0
2241	Mackayi.	Very fine plants with 4 and 5 bulbs, well leaved, 1 strong lead ..	10 6
2242	,,	Stronger plants with 5 and 6 extra fine bulbs, 1 lead	1 1 0
2243	,,	**Charlesworthii. A.M. R.H.S.** .. .. (The albino form) This rare variety has greenish-yellow sepals and petals, and a pure white labellum. Splendid plant of 4 bulbs, and making a strong new growth ..	5 5 0
2244	Perrenoudii.	Good plant with 5 bulbs, 1 of which is a lead	1 11 6
2245	,,	Splendid plant with 6 fine bulbs, 1 lead	3 3 0

COLLECTIONS OF ORCHIDS.

We are at all times glad to give the benefit of our long experience to all interested in Orchids, and on hearing particulars regarding the heating arrangements, situation and aspect of the House intended for the cultivation of these fascinating plants, special quotations with list of the varieties recommended will be gladly supplied.

For Houses with a winter temperature of 52° to 55° Fahr. by night, and 55° to 65° by day, we shall be pleased to supply—

	£	s.	d.
12 ORCHIDS, in variety, our selection, for	5	5	0
12 ,, good varieties, larger plants	10	10	0
12 ODONTOGLOSSUMS, including some of our best hybrids	6	6	0
12 ,, choicer collection and larger plants	12	12	0
12 ODONTIODAS, good varieties, all different	5	5	0
12 ,, stronger plants, including some of our latest productions ..	10	10	0

For Houses with a winter temperature of 55° to 60° Fahr. by night and 60° to 70° Fahr. by day—

12 ORCHIDS, in variety, including some of our noted Cattleya and Læliocattleya hybrids for	6	6	0
12 ,, Similar varieties to above, but larger plants	12	12	0
12 CYRIPEDIUMS, showy and easily grown varieties for	4	4	0
12 ,, Specially selected hybrids to produce large well coloured flowers for	8	8	0

For culture in Warm Houses, we offer—

12 CATTLEYA AND LÆLIOCATTLEYA HYBRIDS, including many large and beautiful varieties, for	10	10	0
12 CATTLEYA, LÆLIOCATTLEYA AND BRASSOCATTLEYA HYBRIDS, specially selected varieties from our noted crosses and including some of our recent productions, for	20	0	0

All plants offered in the above collections can be grown with great success by all amateurs, and every professional gardener would have no difficulty in cultivating and flowering them with ease.

The plants are strong to flower in their respective seasons, guaranteed sound, healthy and true to name.

LIST OF SUNDRIES

A. I. FIBRE. Splendid quality and very durable .. .. 4/6 per bushel.

POLYPODIUM FIBRE. Specially recommended .. .. 6/6 „ „

LOAM. Very fibrous .. .. 3/6 „ „

OAK LEAVES. Broken up and prepared ready for use .. .. 4/6 „ „

SPHAGNUM MOSS. The best thick headed variety .. .. 3/6 „ „

PREPARED POTTING COMPOST. Special mixtures as used by ourselves, consisting of A.I., Osmunda and Polypodium Fibres, Oak Leaves, Moss, etc., in the exact proportions necessary to the successful cultivation of the different families and species of orchids, *viz.* :—

For CATTLEYAS, LÆLIAS, BRASSOCATTLEYAS, LÆLIOCATTLEYAS, SOPHROCATTLEYAS, etc. .. .. 7/6 per bushel.

For ODONTOGLOSSUMS, ODONTIODAS .. .. 7/6 „ „

For SEEDLINGS—

CATTLEYA AND ALLIED SECTION .. .. 8/- „ „

ODONTOGLOSSUM AND ODONTIODA SECTION .. .. .. 8/6 „ „

OSMUNDA FIBRE. Specially selected material, perfectly dry and clean, as sent to us in compressed bales, each containing .. .. 112 lbs. for £ 8 s. 8 d. 0

56 „ „ 4 7 6

28 „ „ 2 5 0

14 „ „ 1 3 6

FLOWER POTS. Neatly made and very porous.

1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in.
13/6			15/-	16/-	17/6	20/-	22/6 per 100

CELLULOID LABELS. Very smart and durable. Prices quoted on application for any size from 2 to 6 inch.

FLOWER STICKS AND JAPANESE GREEN STAINED BAMBOO CANES. Owing to fluctuations in Exchange rates it is impossible to fix a price for these, but we shall be pleased to quote specially, or supply any size from 1½ ft. to 4 ft., to be invoiced at Market price on date of dispatch.

PHYTOPHILINE AND VITIPHILINE INSECTICIDES. Non-Poisonous and free from Nicotine, Æther, Alcohol and Arsenic. The safest, most effective and economical preparations for the destruction of Aphis, Thrips, Scale, Fly, Bug and Spider. To facilitate economy made in three standards and named—

Phytophiline No. 1. To destroy Black and Green Aphis, Black, White and Yellow Thrips, Brown and White Scale, White Fly, Caterpillars and White Ants.

Vitiphiline No. 2. For use on very tender plants, to destroy Red and Grey Spider, White Aphis or Mealy Bug.

Vitiphiline No. 3. For less tender plants to destroy Red and Grey Spider, White Aphis or Mealy Bug, Fungi on Palms, etc., Mildew or Rust on Roses, Peaches, Chrysanthemums, etc.

Directions for use given on each tin, and booklet giving all further particulars sent with each order, or a copy will be posted free on request.

Prices as follows :—	1 pint	2 pint	4½ pint	9 pint	18 pint
	3/6	7/-	15/-	27/6	52/6

Carriage or postage extra.

WHY USE A SYRINGE?

WHEN FOR A FEW SHILLINGS MORE, EITHER OF THESE

"Holder-Harriden" Pneumatic Hand, Knapsacks or Shoulder Sprayers

WILL DO

(1) Ten times the work in a fraction of the time.

(2) Will do it more completely, more thoroughly, and with little or no waste of fluid.

(3) Is as simple to use, and FAR less tedious to handle.

"Holder-Harriden" Hand Sprayer

Pneumatic Principle

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A perfect Hand Sprayer. Can be comfortably carried and operated by one hand. Container Capacity, 5 pints; Spraying Capacity, 3½ to 4 pints.

Instantaneous Automatic Spray control valve gives perfect spray control—in short bursts if required. After container is charged with air will automatically discharge the whole of its contents without re-pumping. Made in Virex alloy, and suitable for all spraying mixtures, including lime sulphur.

Price 63/3 each.

No. S 43

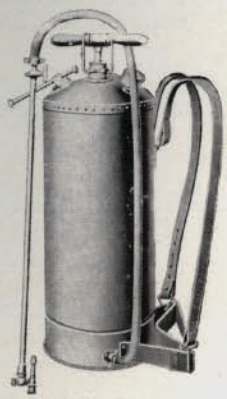
The "Holder-Harriden" Pneumatic Shoulder Sprayer

Price **78/3** each.

Container Capacity, 1½ Gallons
Spraying ,, 1 Gallon

Simplest and Most Reliable Pneumatic Sprayers on the Market Suitable for all Spraying Mixtures

GIVE A FINE MIST-LIKE SPRAY



No. S 42

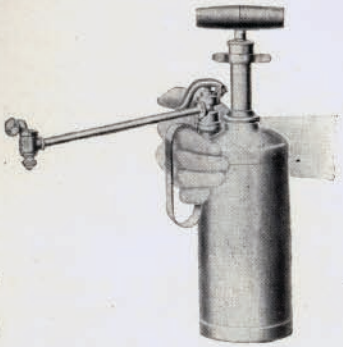
The "Holder-Harriden" Pneumatic Knapsack Sprayer

Container Capacity, 1¼ Gallons Spraying ,, 1 ,,	Price	**94/3** each.
Container Capacity, 2½ ,, Spraying ,, 2 ,,	Price	**118/6** each.
Container Capacity, 4 Gallons Spraying ,, 3 ,,	Price	**138/-** each.

The machines illustrated above show four of the most popular and dependable types of Pneumatic Sprayers.

"Holder-Harriden" Greenhouse Sprayer

No. S 29



A smaller capacity sprayer than No. S 44. Capacity of container, 1½ to 2 pints. Construction and action generally as described for No. S 44.

Method of holding shown by illustration, spray control being operated by thumb lever.

Made in Virex alloy, and suitable for all spraying mixtures, including lime sulphur.

Price 39/9 each.

A handy and reliable spray for all Plants and small Bushes; also for disinfecting, etc.

It is very light, and therefore specially suitable for ladies' use.

All "Holder-Harridens" have self-contained pumps

No outside pump to get lost or mislaid

Knapsack Sprayer No. S 42 is fitted with powerful air pump for charging container with Compressed Air. Complete also with Pressure Gauge, Rubber Hose, Brass Spraying Arms and Swivel Self-clearing Nozzle. Small one-gallon size has only one shoulder strap like No. S 43.

Shoulder Sprayers No. S 43 constructed generally as above. It is an ideal machine for Garden, Greenhouse, or Nursery work.

In the Knapsack and Shoulder Sprayer machines one of the chief advantages as compared with other types is that pumping is done before spraying commences, thereby leaving both hands free for working.

Lund, Humphries & Co., Ltd., Bradford and London. 37654.