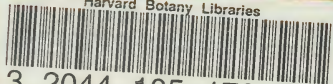


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JOURNAL
OF THE
ROYAL HORTICULTURAL SOCIETY

EDITED BY

D. MORRIS, M.A., F.L.S. AND REV. W. WILKS, M.A.

(SECRETARY)

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ERRATA.

Page 479, lines 7, 8, *instead of* "are scarcely yet developed, as they have not sufficient," *read* "are scarcely developed organisms, with not always sufficient."

Page cxxviii., *preceding* "First Class Certificate," *insert* "Kelway Gladiolus Medal to the Right Hon. Lord Wimborne (gardener, Mr. T. Crasp), for 12 fine spikes of British-raised Gladioli, gandavensis varieties."

Page cxxviii., *under* "Award of Merit," *add* "To Gladiolus Leonard Kelway (votes, unanimous), from Messrs. Kelway & Son, Langport. Flowers large; fine form; rich ruby-crimson."

CONTENTS.

	PAGE
THE VEGETABLE CONFERENCE:—	
OPENING ADDRESS. By Mr. HARRY J. VEITCH, F.L.S.....	2
ASPARAGUS. By Mr. SHIRLEY HIBBERD, F.R.H.S.....	11
WINTER SALADS. By Mr. NORMAN, F.R.H.S.....	18
THE FOOD OF VEGETABLES. By Mr. J. WRIGHT, F.R.H.S.....	20
IMPROVEMENT AMONGST PEAS. By Mr. T. LAXTON, F.R.H.S....	29
" " POTATOES. By Mr. A. DEAN, F.R.H.S.	41
A YEAR'S SUPPLY OF VEGETABLES. By Mr. J. SMITH, F.R.H.S.	47
INTRODUCTION TO STATISTICAL DIGEST.....	58
LIST OF COMMITTEES, EXHIBITORS, &c.....	61
STATISTICAL NOTES, &c. By Mr. A. F. BARRON.....	67
NOTES, CHIEFLY CULTURAL. By EXHIBITORS.....	99
THE CHRYSANTHEMUM CENTENARY CONFERENCE:—	
OPENING ADDRESS. By Mr. T. B. HAYWOOD, F.R.H.S.....	106
WILD PROGENITORS. By Mr. W. B. HEMSLEY, F.R.S., A.L.S. ...	111
HISTORY OF THE CHRYSANTHEMUM. By Mr. C. HARMAN PAYNE, F.R.H.S.....	115
NEW VARIETIES. By Mr. EDWIN MOLYNEUX, F.R.H.S.....	122
JUDGING CHRYSANTHEMUMS. By Mr. J. WRIGHT, F.R.H.S. ...	127
PROGRESS IN CHRYSANTHEMUMS. By Mr. SHIRLEY HIBBERD, F.R.H.S.....	137
SEEDS AND SEEDING. By Mr. F. W. BURBIDGE, M.A., F.L.S.	150
DATES AND AUTHORITIES. By Mr. F. W. BURBIDGE, M.A., F.L.S.....	169
DWARFING AND GROUPING. By Mr. C. ORCHARD.....	172
CHRYSANTHEMUMS FOR PROFIT. By Mr. C. PEARSON, F.R.H.S.	179
SUMMER AND EARLY CHRYSANTHEMUMS. By Mr. W. PIERCY	186
LISTS OF VARIETIES FOR VARIOUS PURPOSES.....	195
DIGEST OF STATISTICS. By Mr. E. MOLYNEUX, F.R.H.S.....	203
NOTES ON COMPOST, CUTTING-DOWN, AND DAMPING.....	218
A METHOD OF WINTER GARDENING. By the Rev. W. WILKS, M.A.	233
THE HIPPEASTRUM (AMARYLLIS). By Mr. HARRY VEITCH, F.L.S.	243
THE HIPPEASTRUM. By Mr. JAMES DOUGLAS, F.R.H.S.....	255
SALADINGS. By M. HENRY DE VILMORIN, F.R.H.S.....	260
SPRING FLOWER GARDENING. By Mr. W. INGRAM, F.R.H.S.....	273
DAFFODIL CONFERENCE:—	
OPENING ADDRESS. By Professor MICHAEL FOSTER, Sec. R.S.	288
REPORT OF THE NARCISSUS COMMITTEE. By Mr. C. R. SCRASE DICKINS, F.R.H.S.....	291
SCHEDULE OF REGISTERED VARIETIES.....	294
REPORT ON WHITE DAFFODILS. By Mr. C. R. SCRASE DICKINS, F.R.H.S.....	295
HISTORY OF CULTIVATED NARCISSI. By Mr. F. W. BURBIDGE, M.A., F.L.S.....	296
NARCISSI IN SCILLY. By Mr. T. A. DORRIEN-SMITH, F.R.H.S.	311
SEEDLING DAFFODILS. By the Rev. G. H. ENGLEHEART, M.A.	316
NOTES ON NARCISSI. By the Rev. A. RAWSON, M.A.....	322
ADDRESS. By Mr. J. G. BAKER, F.R.S.....	325
TRUMPET DAFFODILS. By the Rev. C. WOLLEY-DOD, M.A. ...	326
POLYANTHUS NARCISSI. By HEER J. H. KRELAGE, F.R.H.S. ...	339
DAFFODILS FOR MARKET. By Mr. JAMES WALKER, F.R.H.S....	346
NOTE ON THE CONFERENCE. By the Rev. W. WILKS, M.A.	357

	PAGE
DAFFODIL CONFERENCE— <i>continued</i> .	
LIST OF VARIETIES EXHIBITED.	357
DIGEST OF STATISTICS. By the Rev. W. WILKS, M.A.	370
PRIMROSES. By the Rev. C. WOLLEY-DOD, M.A.	375
THE AURICULA IN TOWNS. By Mr. J. E. HENWOOD	381
REPORT ON THE IVIES AT CHISWICK. By Mr. SHIRLEY HIBBERD, F.R.H.S.	387
REPORT ON POPPIES AT CHISWICK. By Mr. BARRON	396
" " NEW TOMATOES, 1889. By Mr. BARRON.....	398
" " MARIGOLDS, 1889. By Mr. BARRON.....	399
" " TEN-WEEK STOCKS, 1889. By Mr. BARRON	400
" " CHINA ASTERS, 1889. By Mr. BARRON	401
AWARDS AFTER TRIAL AT CHISWICK.....	406
HARDY ANNUALS.....	407
SPRING-FLOWERING TREES AND SHRUBS. By Mr. W. GOLDRING, F.R.H.S.....	409
HERBACEOUS PÆONIES. By Mr. GEORGE PAUL, F.R.H.S.	422
A NEW CLASSIFICATION OF THE GENUS PÆONIA. By Mr. R. IRWIN LYNCH, A.L.S.	428
THE CULTIVATION OF HARDY FLOWERS. By the Rev. C. WOLLEY- DOD, M.A.....	445
LIST OF HARDY PLANTS FOR MIXED BORDERS. By the Rev. C. WOLLEY-DOD, M.A.	457
CARNATION CONFERENCE:—	
OPENING ADDRESS. By Mr. MARTIN R. SMITH, F.R.H.S.....	461
THE CARNATION FROM A BOTANICAL POINT OF VIEW. By Mr. F. N. WILLIAMS, F.L.S.....	464
CARNATIONS FOR EXHIBITION. By Mr. HARRY TURNER, F.R.H.S.	471
THE CARNATION AS A TOWN FLOWER. By Mr. MARTIN ROWAN	477
THE CARNATION AS A BORDER FLOWER. By Mr. R. DEAN, F.R.H.S.....	488
FERN CONFERENCE:—	
WHICH ARE THE OLDEST FERNS? By Professor BOWER, D.Sc., F.L.S.....	496
HYBRID FERNS. By Mr. E. J. LOWE, F.R.S.	505
PLUMOSE BRITISH FERNS. By Mr. C. T. DRUERY, F.L.S.....	514
HARDY FERNS. By Mr. J. BIRKENHEAD, F.R.H.S.	520
FRUIT EVAPORATING. By Mr. E. W. BADGER, F.R.H.S.	532
THE HOLLYHOCK. By Mr. JAMES DOUGLAS, F.R.H.S.	544
HARDY GLADIOLUS. By M. EMILE LEMOINE	549
GLADIOLUS GANDAVENSIS. By Mr. J. KELWAY, F.R.H.S.	564
NOTE ON THE ORIGIN AND PARENTAGE OF G. GANDAVENSIS	574
PROCEEDINGS AT MEETING, JANUARY 14, 1890	i
" ANNUAL MEETING, FEBRUARY 11, 1890.....	viii
REPORT OF THE COUNCIL FOR THE YEAR 1889	x
ANNUAL REVENUE ACCOUNT, 1889	xviii
BALANCE SHEET, 1889	xx
PROCEEDINGS, MARCH 11 TO APRIL 22, 1890	xxvii
RULES FOR THE NAMING OF ORCHIDS	lv
PROCEEDINGS OF THE SOCIETY, MAY 13 TO DECEMBER 31, 1890.....	lvii
BOOKS, PLANTS, SEEDS, &c., PRESENTED TO THE SOCIETY, 1890	clxxiv
CERTIFICATES AWARDED BY THE FLORAL AND ORCHID COM- MITTEES, 1890	clxxvii
CERTIFICATES AWARDED BY THE FRUIT AND VEGETABLE COM- MITTEE, 1890.....	clxxxii
AWARDS MADE TO FRUIT AND VEGETABLES TRIED AT CHISWICK, 1890.....	clxxxiii
AWARDS MADE TO PLANTS TRIED AT CHISWICK, 1890	clxxxiii
INDEX	clxxxvi

JOURNAL

OF THE

ROYAL HORTICULTURAL SOCIETY.

VEGETABLE CONFERENCE, CHISWICK.

SEPTEMBER 24, 25, AND 26, 1889.

THE first day of the Conference was entirely occupied by a thorough examination of all the exhibits by a series of Committees of Selection, whose names will be found on page 63.

On the second day, September 25, at 2 P.M., the President of the Society,

Sir TREVOR LAWRENCE, Bart., M.P., briefly opened the proceedings by complimenting the exhibitors on providing such a fine and representative display of horticultural produce, and on behalf of the Society he extended a hearty welcome to the large body of horticulturists present. He considered it most desirable, in the interests of the community, that more vegetables should be eaten. He was not a vegetarian himself, or likely to become such, but he believed that the too liberal consumption of beef and mutton was not conducive to health. He also suggested that more attention should be paid to the preservation of vegetables, a branch of trade which was at present greatly neglected in this country. If he wanted preserved vegetables, he had to obtain supplies almost entirely from abroad, or at least from tradesmen who supplied goods manufactured abroad. He hoped that, by this Exhibition and Conference, much would be done to bring into greater prominence the best varieties of the several sections, and that some few good vegetables, but little grown now, might have more attention directed towards them in future, such as the turnip- or globe-rooted Celery, Cardoons, &c. With regard to the improvement in cooking vegetables, he thought that in England there was an almost unlimited scope for improvement, and he appealed to the ladies

present to do all in their power to effect a much-needed reform. In conclusion he desired, on behalf of the Council and Fellows of the Society, to thank all who had contributed to the success of the Exhibition, and he thought that their thanks were especially due to Messrs. Vilmorin et Cie., of Paris, and Messrs. J. Veitch & Sons, of Chelsea, for their magnificent contributions. He would now call upon Mr. Harry Veitch to take the chair at the Conference.

OPENING ADDRESS BY THE CHAIRMAN,

MR. HARRY J. VEITCH, F.L.S.

THE Council of the Royal Horticultural Society could not have selected a more important or a more practical range of subjects for exhibition and discussion than that which has brought us together to-day, because it embraces that branch of horticulture which is concerned in the production and improvement of vegetables used as articles of food, not for the exclusive use of any particular class, but for the common need of the whole community. Its scope, therefore, is the widest possible in horticulture, and its importance commensurable with its scope; it is that upon which the most serious care of every gardener is bestowed, and with which his thoughts are most frequently occupied. To bring together, therefore, as on the present occasion, specimens of the vegetables produced in different gardens in different parts of the country for comparison, with the view of noting the march of improvement generally, and the direction in which particular progress is being made, affords also the most suitable opportunity and inducement to bring together the gardeners themselves, and I am truly glad to see so many now present. Before, therefore, proceeding with the few remarks I have to make on the business before us, let me first tender a cordial welcome to all the gardeners who have come to this Conference and to this place so rich in its associations with the history and progress of British gardening during the present century, coupled with the sincere wish that they will continue to co-operate with and strengthen the hands of the Society, as the representative and the exponent of the horticultural interest of the country.

While decorative plants and flowers, in all their varied forms and brilliant and delicate colours, must necessarily form the most striking part of a horticultural exhibition, and also the chief attraction for the general public, it cannot be otherwise that the homely aspect of the vegetables in daily use should cause them to fall into a subordinate place as objects for exhibition to the majority of the visitors. To the gardener, however, they have a different significance, and often a deeper interest attached to them than the more showy products of the flower garden. In fact it is not too much to say that an exhibition of vegetables like the present one is essentially a gardener's exhibition.

There are some simple facts connected with the present state of development of our most commonly cultivated vegetables that are worth bearing in mind. One of the most prominent of these facts is the length of time that it has taken since these plants were first reclaimed from the wild state to attain the perfection in which we now have them. Scarcely a vegetable in daily use can be named that has not been in gardens for centuries. The Runner Bean, the Tomato, and the Vegetable Marrow were probably among the latest to come into general cultivation, and these were as familiar to our great-grandfathers as they are to us, although in a lower degree of perfection and productiveness. The Cabbage is one of the most ancient of vegetables, for we know that it was cultivated by the Greeks and Romans, and it has therefore been in cultivation as an article of food for more than 2,000 years in the south of Europe generally, and following the spread of civilisation into more northern latitudes. In a wild state the Cabbage has been observed to deviate a little from a common type, but under the care of man, in such a variety of climate and soil in which it has been cultivated during so many centuries, it has broken into the various forms we now have it, these forms including the Broccoli, Cauliflower, Brussels Sprouts, Savoy, Kales and Borecole, besides all the varieties known in gardens as Cabbage; and yet it is an accepted theory, I may say a positive belief, held by botanists, that all these various forms have originated from a single herb still to be found wild in places on our own coast, and somewhat more plentifully on the neighbouring coast of France. This plant is the *Brassica oleracea* of science, and is, I dare say, known to many of you. When we contemplate this seaside herb in comparison with its

descendants in our gardens, the results brought about by cultivation are truly astonishing; but the surprise must be modified by the reflection on the length of time it has taken to accomplish them.

Let me quote another instance. The Potato was introduced from America three centuries ago, and has been generally cultivated for at least two hundred years. Quite recently one of our most accomplished botanists—Mr. J. G. Baker, of Kew—has investigated the tuber-bearing species of *Solanum*, and has expressed his belief that all the various forms of the cultivated Potato have originated from one species, viz., *Solanum tuberosum*. From these two instances we see plainly how remarkable are the changes brought about by the continuous cultivation of a single species, and at the same time how long a period, extending over many generations of human life, it takes to effect them. We can understand, too, from these same facts how it is that a plant or herb with properties rendering it suitable for food when improved by cultivation is rarely, if ever, taken in hand by horticulturists of the present day.

There are six known species of tuber bearing *Solanums*, from one of which, *S. tuberosum*, as I said before, all our garden Potatoes have originated. Of the other five there is at least one that promises to be very valuable as the starting-point of a new race of Potatoes, which, under the more scientific gardening of the present age, may be made to bring about satisfactory results in a much shorter space of time than it has taken to bring our present race of Potatoes, under the more primitive practice of our forefathers, to the perfection in which we have them. This is *Solanum Maglia*. I will quote Mr. Baker's words from the *Journal of the Linnean Society*, vol. xx. page 507: "As far as climate is concerned, it cannot be doubted that *Solanum Maglia* (or the Darwin Potato, as we might suitably christen it in England) would be better fitted to succeed in England and Ireland than *S. tuberosum*, a plant of a comparatively dry climate. We have indisputable testimony that *S. Maglia* and *S. Commersonii* yield readily an abundant supply of eatable Potatoes. What I would suggest is, that these should be brought into the economic arena and thoroughly tested as regards their economic value, both as distinct types and when hybridised with the numerous *S. tuberosum* forms." It is very

gratifying to know that the Messrs. Sutton, of Reading, are already busy in this direction.

The vegetables of the immediate future may possibly include the tubers of a Chinese species of *Stachys* (*S. tubrifera*) which was put into commerce two or three years ago by MM. Vilmorin et Cie., of Paris. The tubers have an agreeable flavour peculiar to themselves, but seem to require a few years of assiduous cultivation to develop them into a sufficient size to afford a remunerative crop.

This being the first time such a meeting as the present, with such an object, has been held, I hope you will agree with me that a brief review of our present position will not be out of place. Let us now, therefore, carry back our recollections of vegetable culture twenty-five to thirty years, a period still fresh in the memory of many of you, and try to ascertain approximately what progress has been made during that period, and in what direction it has chiefly tended. The garden vegetables cultivated a quarter of a century ago were much the same as now as regards kinds, and the comparison can thence be made without the introduction of any new element.

To begin with Peas. As the improvement obtained among these during the period in question will be the subject of a special paper, I need only take a general review of the progress achieved. The varieties of Peas in commerce from twenty-five to thirty years ago were probably as numerous as at the present time. During the interval an uninterrupted stream of novelties have been offered to the public year after year, and during the same time upwards of a hundred names have disappeared from catalogues. Of the new varieties brought into cultivation in the period under review forty-two have been awarded First Class Certificates by the Royal Horticultural Society, after having been grown in the comparative trials in the Society's garden, and most of these were subsequently put into commerce; but eight or ten of them have already disappeared. Besides these, a large number of new, or so-called new, varieties have been sent out without having been submitted to the test of the Chiswick trials; and, although some are acquisitions, many of them soon passed into oblivion, or were found to be synonymous with other sorts. Many of the older sorts, however, still hold their place; among such are notably Champion of England, Veitch's Perfection, Ne Plus

Ultra, and British Queen—for quality and general usefulness these are difficult to beat; whilst we find such varieties as Early Emperor, Early Charlton, White and Blue Prussians, Waterloo tall Marrows, and others that could be named, which were once standard varieties and most largely grown, are now happily almost entirely superseded by the later acquisitions.

Under the general name of Brassica is included Cabbage, Broccoli, Cauliflower, Kale or Borecole, Brussels Sprouts, Savoy, a series of vegetables of the highest importance as furnishing a supply throughout the year. A review of what has been done in the way of improvement during the past quarter of a century must, however, be brief, taking them in the order named. Upwards of fifty names of Cabbage in seed lists thirty years ago are not now found there, and perhaps deservedly; but yet very few real acquisitions have been made since. Ellam's dwarf Early Spring, certificated in 1884; Early Etampes and other varieties of French origin, valuable for spring sowing and main crops; and Early Offenham, a fine example of the old Enfield type, are all of comparatively recent introduction. The Broccoli family has always been a numerous one, as many as forty-five names have been noted in a seed catalogue published at the beginning of the period under review; but all are now lost to fame; their place has, however, been taken by perhaps more than that number of new names, their greatest merit being the lengthening of the season. I must mention here the Cabbage-Broccoli called Chou de Burghley, raised and distributed by Mr. Gilbert, of Burghley Gardens; and also the new form of sprouting cabbage raised by Mr. McIndoe, of Hutton Hall, both of which indicate a new departure. Among the newer Cauliflowers, the Autumn Giant, certificated in 1870, has stood the test of time, and is now an established favourite both in gardens and for market purposes; its introduction prolonged the season very considerably, while the Extra Early, certificated in 1880, has lengthened the season in the opposite direction, by being grown in frames or under hand-glasses. Kales are not much appreciated south of the Tweed, although, after a severe winter, they may be relied on when everything else is crippled. Many selections have been offered during the past quarter of a century, but none much in advance of the old Green Curled. In Brussels Sprouts, on the contrary, a marked improvement has been made; but the Savoy

has remained much as it was, with the addition of early dwarf Vienna, and Gilbert's Universal, certificated in 1884.

Among Beans not much has been done in the way of improvement; we still cultivate the same varieties of Dwarf French Beans as we did twenty-five years ago. Ne Plus Ultra among the early sorts, and Canadian Wonder among the long-podded late sorts, are the best introductions of late years; and among Runner Beans, Girtford Giant and The Czar, which were raised by Laxton, are the most prominent improvements. The French varieties of Butter Beans are, I think, deserving of more attention than they have hitherto received; as served in France they are certainly a great delicacy. Some of the old sorts of Broad Beans, as White Blossom, Red Blossom, and others, have nearly disappeared. Beck's Green Gem may be considered an improvement on the old dwarf Fan; Seville Long-pod and Aguadulce, introductions from Spain, have certainly the advantage of producing very long pods, but it is doubtful whether they have so many beans in a pod as a well-selected stock of Hang-downs, of which Bunyard's new selection is perhaps the best.

For upwards of two centuries the Potato has been, and is undoubtedly long destined to be, the staple vegetable of temperate climates. Thirty years ago there were as many sorts cultivated as there are now, or perhaps, more correctly speaking, as many names were in use for real or supposed varieties as there are now; but with this important distinction, that whereas over a great part of the country every district of greater or less area had its own particular sorts under its own local names, and rarely admitted other kinds into cultivation within its limits, the tendency—I may say the practice—especially among professional gardeners, is now almost universal to select the best proved kinds under their generally recognised names, and this has been one of the principal causes that has brought about the improvement in the Potato we everywhere meet with, for it is an undoubted fact that not we only, but also the general public, get better Potatoes now than were supplied thirty years ago. Even that terrible scourge, the Potato disease, has not been an unmixed evil, for thirty years ago the fungoid disease that first came prominently into notice in 1845 was as virulent in unfavourable seasons as it had ever been. The sorts of Potatoes cultivated in the more remote rural districts, especially by non-professional gardeners, had been grown year

after year from the same stocks upon the same land, and had become so degenerated as to offer an easy prey to the ravages of the disease, and in wet seasons so precarious were the crops in some places that the tubers scarcely paid for the lifting. Of late years a better prospect has been opened up; the life history of the worst scourge, the fungus known to science as *Phytophthora infestans*, has been studied out, the cause of the disease is now understood, and a remedy for this, although unfortunately not the sole, but by far the most destructive enemy of the Potato, is, let us hope, within practical reach. In one district in the West of England known to me the effects of the disease have been already reduced to a minimum by constantly changing the tubers—that is to say, instead of selecting the tubers for planting for the following season from the crop grown upon the spot, fresh tubers are obtained from crops grown in another locality, the results being better crops and less disease. These simple facts are well worthy of the attention of all who take an interest in the formation of labourers' allotments, for the main crop of such allotments will surely be Potatoes year after year, and no men have fewer opportunities of effecting the desired exchange of tubers, or are more prone to continue selecting them from their own stock, than those who are under the necessity of getting through the greatest amount of cultural labour in the least available time.

Turning to tap-root vegetables, we find that thirty years ago only three varieties of Beet were generally cultivated. Dell's Crimson, introduced in 1869, has, under many synonyms, taken the place of most of the older forms, while the Egyptian Turnip-rooted has been a welcome addition to the sorts for early use. Among Carrots the old sorts are still more or less cultivated, but selections from some of the French varieties, such as the Early Nantes, Guérande, and St. Valery, are now extensively grown. One peculiarity in some of the newer sorts should be noted—they are of a uniform bright red colour throughout, and destitute of the yellow core so familiar in the older kinds. Generally speaking, the improvement in Carrots has tended towards the production of earlier varieties, better shape, better quality, and greater weight of crop. The Parsnip being of so much more restricted use, naturally falls into a subordinate place, and the old sorts still hold their sway.

The season for garden Turnips has commenced earlier by the introduction in 1883 of the extra Early Milan, which comes into use from ten to fourteen days before any other sort. Many of the old kinds of Onions are still the best, but among more recent and desirable varieties I may mention the Rousham Park, the Queen, the Roccas and other Italian Onions, all useful introductions and much in demand of late years.

The Vegetable Marrow, one of the most popular and cheapest of vegetables when in season, has received at least two useful additions of late to the number of its varieties in Pen-y-Byd (the best in the world), raised by Mr. Muir, of Margam Park, Glamorganshire, a small round-fruited sort, and Hibbert's Prolific, a small egg-shaped variety. One of the first to improve this vegetable was the late Mr. Thomas Moore, of the Chelsea Botanic Garden, who raised Vegetable Cream.

A few other kinds of vegetables have yet to be noticed which, on account of some special requirements in their culture, are still restricted to gardens in which these necessary requirements can be provided, or can be grown on a large scale for market. Among these the fine form of Sea-kale called Lily White is an improvement both in colour and flavour on the old form with purple colouring. The Tomato is yearly increasing in popularity, and receives a corresponding increase of attention from cultivators; its season has been extended to almost throughout the year. Thirty years ago not more than four or five varieties appeared in seed lists, but now the enumeration of them fills well-nigh a whole page of some catalogues; without referring to any of them by name, the best of them are undoubtedly in advance of such old sorts as De Laye, Powell's Prolific, &c. The cultivation of the Mushroom has increased enormously of late years; it is perhaps no exaggeration to say that, for every pound produced by cultivation thirty years ago, upwards of a ton is so grown now.

I will take but a glance at the progress made in Saladings. In Lettuce, during the period under review, a multitude of varietal names have appeared and almost as rapidly disappeared. In the Cabbage-lettuce section, the kind known as All the Year Round has proved a useful introduction, and retains its place as one of the best; Early Paris Market is one of the best early kinds, and is much cultivated. In the Cos section, Paris White, Hicks'

Hardy White, and Bath Cos are among the most useful. In Celery, too, the list of names constantly increases, so that selection sometimes becomes difficult. Of the red varieties, Major Clarke's is one of the best of recent introduction, and, among the white kinds, Turner's Incomparable White (syn. Sandringham) holds its own. The finest addition to the varieties of Endive is the improved brown-leaved Batavian, certificated in 1878; this is by far the best of the broad-leaved forms.

Among Radishes the best improvements come from France; the extra-early Turnip varieties are useful for growing in frames, whilst the white-tipped olive-shaped, or French Breakfast, is one of the most largely grown. Although the Cucumber is properly a fruit, it is practically looked upon as a salad. Here again, as in the case of many other popular vegetables, the multitude of names is bewildering. Rollisson's Telegraph and Douglas' Tender and True are both standard sorts.

The brief *résumé* I have now given shows abundantly that there has been no lack of activity amongst horticulturists in bringing out new varieties of vegetables, especially of the more popular kinds. I am not sure whether a still greater activity has not been displayed in the production of new names, for if we compare an ordinary seed catalogue of many years ago with one of the present time, the surprising difference in the number of names, if not of sorts, is apparent enough. So great has been the embarrassment caused by the great excess and rapid multiplication of vegetable names and so-called new sorts for some years past, that the Royal Horticultural Society was thoroughly justified in taking the matter up by commencing a series of comparative trials in these gardens, which has resulted in the elimination of a large number of these names, not only from all well-regulated gardens, but even from seed lists. It is greatly to be desired that these trials should be continued as one of the most effectual means of putting a check, not only to the excessive increase of useless names, but also for proving the novelties offered in such profusion year by year, that those of real merit may receive the public recognition they deserve, while the inferior ones will be left to drop into oblivion. The Society in doing this is exercising one of its highest functions, a function that would have little or no weight if undertaken by private individuals, and therefore I need scarcely appeal to the gardeners here present,

and through them to their absent brethren, to support its authority, which, when exercised in this way, is exercised for the common benefit of all ; and I venture to think that everyone present to-day will quite agree with me that the objects for which we are now particularly met together—that is to say, “ the promotion of the profitable cultivation, uses, and improvement of all kinds of roots, tubers, bulbs, leaves, flowers and seeds, by the reading of papers, discussion of propositions, and demonstrations of practice, and to bring together, for the purpose of reciprocal information and fellowship, all those interested in the growth of vegetables ”—are objects worthy of such a Society.

ASPARAGUS ON HEAVY LAND AND ASPARAGUS FOR THE TABLE IN AUTUMN.

By Mr. SHIRLEY HIBBERD, F.R.H.S.

ON the history and cultivation of Asparagus in a general way I shall at this time have nothing to say. And what I propose to say is germane to myself in the first instance ; but it may have some practical bearing, for it is simply a record of practice, which I shall preface by giving a reason why.

At a time when I occupied a clay land, mostly in grass, and requiring for gardening purposes to be tamed from a condition of stolid savagery, there arose a demand for Asparagus, not as a luxury or occasional feast in spring, but as a necessity, and to be in use for the table through as long a season as possible—that is, if possible, all the year round. The land was almost as unfit for Asparagus as an equal area of granite, for the clay was like flint, and required years of cultivation to fit it for such a purpose. The rule adopted for the majority of crops was to break up the grass, and turn the top spit down, with a heavy layer of fat stable manure upon it, and then turn over the next spit upon that. The land was then made up into ridges with stable dung between two surfaces of turf. But Asparagus and Potatoes were grown above the clay in earth partly or wholly made for the purpose, the procedure being as follows :

It was found an easy matter to secure any quantity of lime rubbish from buildings in process of demolition. The business

had to be managed with tact, but it ended in the shooting into a yard convenient for the purpose of rubbish of this kind, costing never more than one shilling the cubic yard, with a trifle added to the carters. This stuff was roughly sorted to remove from it bricks, laths, and other material of an objectionable nature, and being thus purified it was wheeled to the site of an intended Asparagus bed. There had been provided in time a store of turf, mud from a pond, and a heap of refuse from the kitchen garden, moulded over to prevent annoyance. The bed was made of this mixture 6 feet wide and 3 feet high. The length is of no consequence, but it happened for convenience that all the beds made in this way had a length of 60 feet. There was always left a 6-foot space between the beds, which was increased by subsequent management, as will be seen.

If the bed was made in summer it was at once sown with winter Spinach; if made in winter or spring it was planted in March with early Potatoes. This preliminary cropping was to allow time for the stuff to settle and amalgamate, and that digging and other operations might temper its crudities. When the preliminary crop was removed, the bed was dug over, stones and bricks thrown out, a good body of fat dung laid in, and then the bed was sown with two rows of Asparagus at a distance from each other of 36 inches.

Asparagus seed may be sown at any time from the 1st of February to the 1st of August; the earlier it is sown the better, but late sowing will make a plant before winter, and it will live to make a vigorous start in the following spring. The sowing completed, the beds were neatly cut down to $4\frac{1}{2}$ feet, which placed the outside rows at a distance of 18 inches from the boundary line of the bed.

The cultivation in the early stages consisted in weeding and thinning, the plants being successively thinned until, in the second growing season, they were 3 feet apart. In the latter part of July and through the month of August the bed is well soaked with liquid manure put on quietly from a hose, and care is taken not to remove the dead straw of the summer growth, for that is useful to the plant, until November, when it must be cleared off. But the straw containing seed is all cut out as soon as the berries are fully coloured. Every year, in July or August, as may be convenient, and as the state of the weather may influence the

business, the irrigation is repeated. Early in the third growing season the beds are lightly covered with a strewing of rough grass, hay, or other litter to protect the rising shoots. This is a matter of great importance. The litter should not be strewed until there are signs of growth, and then it will be of great service, and will augment the supply of shoots by protecting them from frost. The litter need not be removed, for if it is light clean stuff the growth will push through it and the stuff will settle itself.

In this third growing season further care must be taken to protect the plant. If the produce is gathered as I shall propose, the green tops will attain to dimensions far beyond what is commonly seen, and the summer storms will wrench them and do much damage. Our rule has been to thrust a lot of pea-stakes between the rows to give support; the stakes must be stout, and firmly planted, but ties are not wanted; it is sufficient if the green tops have something to lean upon when strong winds prevail. In November the beds are lightly forked over, made clean from weeds, and a dressing of stable dung is put on to give protection through the winter and nourishment in spring. In very dry seasons the irrigation is preceded by lightly pricking the soil between the rows with a small fork; great care must be taken to avoid any damage to the grass or top-growth throughout the season, for every spray contributes to the vigour of the roots and tells upon the crop at last.

On breaking up some of these beds on a certain occasion, I had the curiosity to trace some of the roots, and I found they had entered freely into the clay below, and had therefore pumped up from it a lot of support. The reason for breaking up the bed was to supply a nurseryman with roots of what he insisted on regarding as a distinct variety. I told him as I tell you, there is no peculiar variety of Asparagus; there is but one, and when differences are observable they are due solely to cultivation. The variations in growth of the plant are strikingly illustrated by the samples I place before you. For the average of gardens, wherein it is the practice to cut all that appears until about the end of June, straws 2 feet high and of the thickness of a common lead-pencil may be considered a fair growth. The spring produce of such beds will consist of heads of the thickness of the middle finger of a man's hand for the very best sample, down to mere sprue, which in many cases predominates.

You know how common is the practice of purchasing something better than the home garden produces when the occurrence of a dinner party renders it necessary to adorn the table with handsome grass in some degree of plenty. A better growth is here in straws 6 feet high and $1\frac{1}{2}$ inch in circumference at the base, indicating a supply of heads in spring such as we should describe as handsome and altogether desirable for the table, both for size and quality, without running to an extreme. But an extreme case is as likely to prove instructive as a poor one. Here, then, I invite you to admire a growth running to 7 feet 6 inches, the circumference of these straws at the base being $2\frac{1}{2}$ inches. This we will call "giant" Asparagus, for the heads will often surpass in thickness that of a big man's thumb, which I suppose does not often exceed 3 inches in circumference. This giant growth is the produce of a fertile soil containing a notable proportion of calcareous salts; and it equals the gigantic growth of Argenteuil, which, I beg you to observe, has the advantage of a calcareous soil on which the Grape-vine thrives, for the Asparagus is grown there on the same ground as the vineyard Grapes. I am fully satisfied that the extravagant manuring practised in the cultivation of Asparagus is in very many instances extravagant waste, for the plant is thereby supplied with but a little of what it requires, and very much of what it does not require. Lime and silica are primary requirements, and the alkalis and nitrates supplied in ordinary manures are certainly required in liberal proportions, but are very often provided in excess, for, the lime being deficient, it is impossible for the plant to appropriate all the possible food within its reach.

The taking of the produce is a most important matter. The practice that prevails is to cut all that rises, including fat shoots for the table and lean sprue for the soup-tureen. It is a destructive practice—a killing of the goose for the golden eggs. The plant endures it, and repairs itself from July until the chill of autumn stops the growth; but under such treatment it never attains to its full vigour and luxuriance; it is a puny thing, making shoots like skewers for the table, and green tops as weak as fennel and less majestic for its own use, when the destructive process comes to an end.

It was the rule in the culture I am describing to cut only

the finest shoots and leave all else to grow naturally, and one result was an abundant green growth in the early days of May, when the visitor unaccustomed to the business might remark that the Asparagus was going to ruin through being allowed to have its own way so out of time and season. But when that happened, I would take a basket and in a few minutes cut half a hundred handsome heads as thick as a man's thumb—and thicker than a man's thumb Asparagus should not be—and with a great depth of green, and this when cooked was eatable half the way down, and of the finest flavour possible for Asparagus.

When I began this business I did not anticipate or aim at what really happened. But I found that in a fairly good season, with rain enough, and the plant having its own way from the first, except that it was tenderly robbed of a few of its best shoots occasionally, those best shoots were presented in succession, and often in great plenty during August and September, and I have gathered a supply in October, although that, it should be observed, was an exceptional case.

If you say you do not want Asparagus in August and September, I have no reply. So far as that goes you need not heed a word I say. But probably there are some confiding ones in the world who will believe me when I say that Asparagus with partridges is a most happy combination; it is like a mixture of silver and gold, for these two delicacies belong to the precious metals of gastronomy. But I wanted Asparagus of fine quality in great plenty and through as long a season as possible, for what reason I need not declare, for I am here to talk of possibilities in horticulture, and not of my private affairs. It is enough to say that I made a fine plant on clay land of a forbidding nature, and, by treating the plant generously, it repaid me beyond all hope or expectation.

It is customary to see in English gardens Asparagus beds that never have and never can pay a reasonable rent for the ground they cover. Usually the seed is sown too thickly in the first instance, and is never after sufficiently thinned. Beginning in this bad way the case is soon made worse by the appearance of additional plants from self-sown seeds, and thus we have a crowd fighting for food with the usual result of a puny, unprofitable growth. The practice of cutting all that rises until the end of June completes the system of how not to do it, and many who

should have a fine example from their own ground are compelled to purchase when creditable Asparagus must be seen on the table. As the plant contains a considerable proportion of the salts of lime, calcareous matters should always be secured for its service, except when the soil is naturally furnished with such substances.

Having made mention of the production of table Asparagus in autumn, it will be expected that I should devote at least a few words to that part of the subject. By the ordinary course of cultivation an autumn supply is not to be hoped for, but it will occur in a warm moist autumn, and may be regarded in a general way as an accident of not much consequence. I have said that during many long years it was of the utmost importance to me to have a continuous supply of Asparagus, and any hiatus was in the nature of a disaster. The very conservative system I followed of never cutting more than was wanted, while having a considerable breadth of plant to cut from as compared with actual quantity required—this very conservative system made me often rich in autumnal supplies, and it was just a question when frost would bring it to a stop, for, so long as growing weather continued, I generally could ensure respectable Asparagus until about the 8th of October, even on the cold clay of the valley of the Lea. But where severe cutting in spring is practised an autumnal supply should not be looked for, and perhaps in a majority of gardens it is not wanted. But for the information of any to whom a late supply might be of advantage, I will say that the surest way to obtain it is to set apart a bed in a sheltered position, and to abstain from cutting a single stick therefrom until the days begin to shorten. It will make an early and vigorous growth, and the straws will ripen early and the plant will take a rest in July. Then it may be persuaded into a new growth by irrigation, and some handsome table grass may be secured, and will be found to harmonise with grouse and partridges perfectly.

The samples of table grass before you are such as in spring would be considered of fair average quality. They may be described as 6 to 9 inches long, and $1\frac{1}{2}$ inch in circumference, with a fine length of tender green meat for the lover of what is called "English" Asparagus. On the grave question of the superiority of white or green grass, I have

nothing to say; it is a question of taste solely, but, the taste being defined, it is an easy matter for the cultivator to gratify it; in other words, we can produce Asparagus in the Continental style without difficulty, and the reason English Asparagus is green, is simply that the English people prefer it so.

DISCUSSION.

Monsieur HENRI DE VILMORIN said it gave him much pleasure to throw what light he could on the cultivation of Asparagus. He had carefully studied the growth of the vegetable, and was in a position to state that the production of large samples was the result of both selection and cultivation. He did not agree with the statement that the selection of seed from the centre of the plant was of importance. He, moreover, believed that it was made to divert attention from the point of real importance, which was to select seed from the plants producing stems of the greatest thickness. As the strength of each plant was necessarily limited, those plants producing but few stems produced the strongest shoots, and were consequently selected for the supply of seed. The great French growers, he said, gave more space than that advised by Mr. Hibberd, the usual distance being 4 feet in the rows and 3 feet between the rows; but of course the produce would not pay, unless it were of such good quality as to command the highest possible price. An abundance of manure was used; and, in order to expose the crowns to the influence of the atmosphere, some of the soil was in autumn removed from about them, and the crowns again covered in the spring to assist in blanching the heads.

With regard to what Mr. Veitch had said in his opening address about the multiplicity of names of vegetables, Mons. Vilmorin remarked that seedsmen were bound to supply what their customers required, and that the varieties of vegetables differed considerably in their adaptability to the various countries, and the different parts of each country. The cultivator was the best judge as to what would suit the conditions under which he had to produce his supplies, and the seedsman was bound to meet his requirements. At the same time it was highly important that cultivators should be educated to appreciate the finest kinds in the several sections, as a little difference in the time of

being ready for use, or in the quality, might make all the difference between the crop proving remunerative or otherwise.

Mr. VEITCH said it would perhaps be as well to state that what he said applied solely to English gardens, and to such kinds as were not specially influenced by local conditions.

ON THE PRODUCTION OF WINTER SALADS.

By Mr. NORMAN, F.R.H.S.

To supply Salad in winter is one of the most important duties of a gardener ; to have it through our long winters requires a great deal of care. Lettuce, the most important of Salads, is always in request. As seasons vary so much, it is impossible to fix upon dates for sowing in any part of England. I commence sowing for winter about the 1st of July ; I sow again about the 15th of July and the 1st of August. The varieties I like best for winter are Brown Cos, Lee's Immense Hardy Cabbage Lettuce, with some Victoria Cabbage Lettuce for the early part of the winter. These are planted out as soon as large enough, about 10 inches from plant to plant. If the season is warm the earlier sowings are ready for use in September, which does not matter, as Lettuce are in great demand at all seasons. My object is to have as many as possible ready for use and half-grown by October. Frost is very destructive to full-grown Lettuce, therefore, when October comes, it is necessary to have mats, or some kind of protecting material, ready to cover them with on all frosty nights, on the quarters where they have grown, or they may be lifted and laid in close on a south border or some sheltered situation where they may be more conveniently protected. By this means good Lettuce may be had out of doors to November, and, in favourable seasons, to quite the end of that month.

The plants that are about half-grown I lift with as many roots as possible, and plant in cold pits and frames between the 1st and 15th of October ; these, with plants sown about the 15th of August, and planted as soon as large enough in pits, give a supply from November to March. I sow again, and it is generally the last sowing of the season, about the 1st of September, the plants of which sowing are planted on a south border, and in a frame by the side of a greenhouse, about 5 inches apart, so

that about the 1st of February each alternate plant may be lifted with a trowel, and planted in a frame on a few warm leaves, or between rows of Potatoes in pits. These soon give a supply of tender Salad, and, with those in the frame, generally keep up a supply till the early autumn-planted ones are ready for use on the south border, which will be from the 1st to the latter part of April.

To produce Lettuce from April to October is generally easy; they require to be sown frequently, and planted on good ground, with plenty of water in dry weather. Lettuce in frames require to be grown as hardy as possible. This may be done by having the lights off on all favourable occasions; but cutting winds must be guarded against, and frost excluded, and they should never be allowed to get dry at the roots.

Endive, next to Lettuce, is the most important kind of Salad. It is more hardy than Lettuce, which makes it very valuable as a Winter Salad. I grow two kinds, the Green Curled and Round-leaved Batavian. I make three sowings from the middle of June to the middle of August, and plant them out as they are ready a foot apart, in beds about 5 feet wide. As Lettuce are preferred, I do not supply Endive as long as good Lettuce are out of doors; therefore some are tied to blanch about the 1st of October, and others in batches at intervals to keep up the supply. While they are green they will stand sharp frost, but the blanched parts will not bear it. From about the middle of October the full-grown plants are covered with mats on frosty nights. As the season advances and severe frost sets in a 32-size flower-pot is placed over each tied-up plant, and leaves or litter over all. By this practice a supply is generally kept up till March.

Chicory, or Witloef, sown about the 1st of June in drills a foot apart, taken up in winter, and forced in the dark, makes a useful Salad.

Corn Salad, or Lamb's Lettuce, is a very hardy plant. About the 1st of June is a good time to sow it. It is indispensable, as it stands the winter well, however severe. I always keep it for February and March—the most difficult season to supply a Salad.

Celery, as well as being supplied plain, is useful for mixed Salads.

Tomatoes make a delicious Salad.

Stachys tuberosa will, I believe, be useful for Winter Salads.

VEGETABLE CONFERENCE.—THIRD DAY, SEPT. 26, 1889.

Mr. SHIRLEY HIBBERD, F.R.H.S., in the Chair.

THE FOOD OF VEGETABLES.

By Mr. J. WRIGHT, F.R.H.S.

WHATEVER difference of opinion may exist in respect to methods of procedure, all will agree that before vegetables can be used as food they themselves must be fed. Food is the motive power of growth, and just in proportion as the food is suitable in quantity and kind, in the same proportion will the crops be satisfactory for the purpose for which they are grown; or, in other words, they will contain the desired properties and flavour that are peculiar to the different kinds when produced and prepared in the best condition.

It is necessary to allude briefly to the qualifying "condition," for few persons can have had many years' experience in growing vegetables without becoming aware that all the care and skill, and even success, of the cultivator may count for little through the ignorance of the girl in the scullery, and the want of care, if not something more, of her superior the cook. It is due both to gardeners and the owners of gardens to mention this, not with the object of suggesting an excuse for any shortcomings on the part of the former, but in the interest of fairness, justice, and truth.

I am not aware of any achievement of which a gardener has more reason to be proud than that of supplying the different vegetables in season of the highest order of excellence, and I have a strong conviction that the man who does this will not be far behind in anything he may undertake in other departments, if a fair chance is afforded him. But all men cannot succeed equally in high-class vegetable production. All do not, and cannot, work under equal conditions. Physical obstacles, such as work preponderating over workers, and natural sterility of soil, are much more formidable obstacles in some cases than in others. But even with no great differences in those respects there may be far from uniformity in results. Some persons fail, more or

less, by lack of knowledge, others through lack of means. The former it is the duty of the gardener to acquire, the latter the owner of the garden should supply.

It is an enormous advantage to a gardener when the owner of the land under cultivation knows the requirements of crops, and desires, as all landowners should desire, to see them well produced. The means will then be supplied the more freely because they will be applied wisely and profitably. A lack of knowledge on this very important subject may lead to starved crops on the one hand and to a waste of wealth on the other, for the source of wealth is the food of crops.

We have now more immediately under consideration garden vegetables. What is their food? A deep thinker and sedulous searcher for truth goes so far as to suggest that each variety of plant requires its own appropriate food. No doubt that is so, but I cannot think that different vegetables require different kinds of food, but only different quantities of the same kinds for their sustenance, and it is the relative proportions of the ingredients required by different crops that the gardener should study if he desire to develop the best qualities in those crops as represented by the best flavour and most nutritious properties of which they are capable.

The mere size of vegetables does not, in my opinion, represent superior culture, because in the first place I suspect abnormal bulk is obtained at the expense of something of inherently greater value—for instance, gold. We may see Cabbages, Cauliflowers, Celery, Turnips, and other vegetables of titanic proportions or three or four times the size of the best produce for table, but if the cost of production exceeds the value of the articles produced where is the credit attaching to cultivation? Observe, I do not object to a person spending money in the preparation of a horse for winning the Derby, or a bullock for securing the blue ribbon at the Smithfield show, because there is a special object in view, the attainment of which may justify the outlay, and it is the same with gigantic vegetables. They are grown for a special purpose, and invested with an extra food value; but if everybody were to invest the same amount as represented by time and materials in attempts to produce similar examples, not only would the great majority fail in their object, but the practice, if generally indulged in, would lead to bankruptcy.

It is not in the least humiliating to take a lesson occasionally from what we call the brute creation. I dislike the term, but use it because it is expressive. In the spring of the present year I had the pleasure of examining a pasture in Sussex. It was on the estate of Dr. Hogg. One portion of the field had been dressed with farmyard manure, another with a mixture of superphosphate of lime, chloride of potash, and a little sulphate of ammonia.* The majority of human beings would have pronounced the yard-manured portion the better, because of the taller herbage, but the cows did not, and they ate the herbage on the latter, rejecting the better-looking. They knew exactly how far to go, and the dividing line was as clear as if it had been cut up to with a scythe. Will anyone tell me the animals made a mistake? They made no mistake. The herbage they chose was without doubt both better-flavoured and more nutritious than that which they rejected, because the yard manure was deficient in food constituents, which the artificial mixture contained. This is not mentioned with the object of condemning farmyard manure, for some of it is of great value, but for showing by comparison in a plain way that bulk in vegetables is not a criterion of merit for the purpose for which they are grown. They must be fed with ingredients which impart to them their distinctive qualities before they can in turn serve as food of the most enjoyable and wholesome kind for consumers. Some so-called manure is lamentably deficient in those ingredients, and the crops that are grown by it must of necessity be deficient too. They must have all they need to render them perfect.

What has Liebig said on this important subject? Here are two of his "laws" which should be learned by heart by every gardener:—

1. "A soil can be termed fertile only when it contains all the materials requisite for the nutrition of plants in the required quantity and the proper form." We must note that some of the ingredients do not suffice, but "all" must be there, and in the required quantity (be it large or small), also in the proper form—

* Proportions—2 cwt. superphosphate of lime;
 2 cwt. chloride of potash;
 1 cwt. sulphate of ammonia.
 Application—4 cwt. per acre.

a condition of vital importance. They must be soluble, ready for use when needed, or they may as well not be there so far as regards the immediate crop.

2. "With every crop a portion of these ingredients are removed. A part of this portion is again added from the inexhaustible store of the atmosphere; another part, however, is lost for ever if not replaced by man." Those are fundamental truths, and with them is incorporated the responsibility of cultivators. The atmospheric food referred to is of enormous importance. This will be apparent when the fact is grasped by all, as it is by many, that more than ninety out of every hundred parts of vegetables is derived from the air, or, in other words, ninety per cent. of the food of crops is derived from the air under favourable conditions in the form of rain and gases that act as solvents of the matter locked up in the soil. The earth must be filled, so to say, with air; but it must be moist, or it will be useless. And here we see the importance of tillage and drainage; because, if water cannot percolate through the soil, air cannot enter to warm it and render the food therein available. Warmth represents life and growth; cold, death and stagnation; and it is utterly useless—indeed worse, because wasteful—placing manure in water-logged land. Some soils are too light and porous, needing additions of heavier to increase their retentiveness, otherwise the air in them would be dry and of no service; others may be too close, and need opening material for the admission of air; but no matter the texture of soil, whether sandy or clayey, if it is water-logged it is cold, inert, even poisonous; and the sun cannot increase its temperature till the excess of water is evaporated, any more than water with a lump of ice in it can be warmed over a fire till the ice is melted. The cultivator, therefore, for making the most of the virtues of the atmosphere and manure, must have the soil in the best condition for their absorption and retention, stirring, hoeing, or mulching, as may be in turn required. Then, and not till then, can the mineral ingredients already in the soil, or which may be added to it in the form of manure, be appropriated by the crops under cultivation.

Depriving the land of the labour that is requisite for the maintenance of its fertility is a gigantic mistake; and I can give a striking instance of the hoe, timely and properly used, being a creator of wealth, but must go out of the garden for it. Three

years ago the steam threshing-machine was at work on a farm at which I was resting. I asked the man in charge if he could run as much grain through in a day as he could twenty years ago. "Nothing like, sir," was his reply. "How do you account for it?" was the next question. "By the farmers not hoeing their corn," was the prompt reply; and he went on to say that, to save expense, they ceased hoeing, but they were finding their mistake out. One of them had a fourteen-acre field of wheat, quite level and uniform in appearance in the spring. Half of this was hoed twice at a cost of 7*s.* 6*d.* an acre, the other half left untouched. The crop from the two portions was kept separate, and when half was threshed the machine was cleaned for the other. The results astounded everybody, for the yield from the twice-hoed half was just under five quarters an acre; that from the let-alone half just over three quarters. The food from the air admitted in the hoeing contributed to the greater yield, and the weeds where the hoe was not used accounted for the lesser by abstracting nearly half the food-producing material from the land. The 7*s.* 6*d.* spent in labour more than earned the whole rent of the land, and the corn has been systematically hoed in the district ever since.

Now we come back to gardens. Those which yield the most and the best of vegetables, and for which occupiers pay the highest rents, are the best supplied with labour. "And with manure," someone may ejaculate. Yes, with manure; but without the labour much of the manure would either be wasted on weeds or remain unused—washed away, because of the non-insertion of seeds and plants at the right time for appropriating and turning it into money, in the form of profitable crops.

But what is manure, or the ingredients which crops abstract, and which, as Liebig says, are "lost for ever" if not replaced by man? What are known as natural or animal manures employed in cultivation are obtained from vegetables, which, as Johnston says, contain "ready-formed—that is, formed during their growth from the food on which they live—phosphate to form the bone, gluten to form the muscle, oil to produce fat." Now if the food referred to is defective in the requisite constituents, so must the animals be, and so must be the resulting manure. Such is the fact, and it is impossible to get nourishing food out of vegetables that do not contain it, as they cannot if

it is not in the soil, but as they certainly will if it is there and within their reach.

Some persons condemn natural manure and extol the so-called artificial; others condemn the artificial and extol the natural. I think it is better to do neither, but to discriminate. Ville, the great French chemist, says land to which farmyard manure only is applied, is being gradually exhausted, and that its fertility can be better maintained and crops better fed with the three ingredients—lime, potash, and phosphoric acid in combination with nitrogenous manure. Professor Wrightson says farmyard manure has no equal. Stephens, in his "Book of the Farm," says a ton of first-class well-made manure should contain between 12 and 14 lbs. of nitrogen, 11 to 15 lbs. of potash, 8 to 9 lbs. of soluble salts of phosphoric acid (as in superphosphate), and 10 to 13 lbs. of insoluble phosphate (as in bones). As these are all the ingredients Ville asks for, and as the manure also acts mechanically in opening the soil, supplying silica, and eventually humus—which is the nursery of Bacteria or micro-organisms, that render the nitrogen active by converting it into nitrates—such a mixture of good things must be long in exhausting the land. It will feed the land and the crops; but—and here is the point—not one ton of manure in ten thousand equals, or even approaches, the standard named. The bulk of the material that gardeners have to work with does not half equal it, and a vast quantity is but a poor apology for the genuine article—the husk without the kernel, a dead body from which the spirit has gone.

Then come the value and the need of the concentrated essences known as artificials. Every gardener should have a supply of these, and he may then not only increase the produce of the soil, but improve it—storing the vegetables with food, without which, though they may be passable, they cannot be perfect. Phosphoric acid with potash, the former preponderating, for the Brassica family; potash with phosphates for the Legumes or pod-bearers, also Potatoes; and nitrogen for every crop that needs a whip on to enable it the more freely and fully to abstract the substantial ingredients. With superphosphate of lime, chloride (or nitrate) of potash, the latter the more potent and costly, also nitrate of soda, or sulphate of ammonia at hand, the gardener can improve his probably poor farmyard manure con-

siderably, and indeed need not wait for it, as so many men have to do, till they lose their tempers and prejudice their crops.

When special manures are found to be good, they contain the above-named ingredients, and possibly others, which may act beneficially in certain soils; thus magnesia for Potatoes and Peas; soda for Asparagus and Carrots, and chlorine for Beet and Onions (both imparted by common salt), and a little iron for most crops. According to the experiments of Dr. Griffiths, principal of the Lincoln School of Science, many soils do not contain sufficient of this ingredient. His "Treatise on Manures," which is an admirable work, contains striking examples of half a hundred-weight of iron sulphate (green vitriol) per acre increasing the crop of Potatoes, Turnips, Mangolds, Cereals, and Beans, while it cured the stubborn root disease of Cucumbers (according to the evidence of Mr. Crocker, of Ham Green Tomato fame), and gave him extraordinary crops. Passing for a moment from vegetables, Mr. Divers has recently stated in the *Gardeners' Chronicle* its efficacy in curing a fine Peach tree of "yellows." I have seen the tree, and can pronounce the cure complete. For vegetable crops about a quarter of an ounce to the square yard will suffice for experimental purposes, either in solution or powder, this to be applied only when the soil is wet to yellowish-looking plants and crops, for producing colouring matter or chlorophyll. It should be remembered that lime is essential for all garden crops, and that salt is good for all, and should be applied in inland districts, especially to naturally clay soil, at the rate of 2 cwt. per acre, or nearly an ounce to the square yard, in spring.

But while the soil must be fed for feeding the crops, it is possible to impair its productiveness by over-manuring, especially with matter from stables of milking cows, and decayed leaves. I once took possession of a garden that was like a mass of humus, through additions of that nature for generations perhaps. A walking-stick could be pushed down it to the handle easily. One plot, I was told, would grow Potato-plants, but no tubers. I found that to be a fact, and recorded it in the *Journal of Horticulture* at the time. Peas were yellow and profitless. The soil was poisoned with acids, and lime was needed to neutralise them, also to set free the dormant nitrogen. It was given freely (a bushel to the square rod = $30\frac{1}{4}$ yards). Potash and bone

meal were also applied. The effect was magical, and the crops of Potatoes and Peas, where they would not grow before, were remarkable. Why were potash and phosphates so much needed? Because there were none in the cowyard manure. The phosphates were drawn away with the milk. Manure from milch cows, especially if largely fed on grass and roots, is greatly over-estimated. There is little good in it to feed crops. It may make them grow, but the growth is comparatively worthless. Proof of this can be found in any cow pasture where the manure is not spread. The grass grows freely enough, but the animals refuse to eat it, and eventually tussocks form and pastures are spoiled. Manure from full-grown well-fed bullocks is very different, for it is rich in phosphates and other nutritive or manurial properties. It is well, then, as I said before, to discriminate.

If weak manure is supplied to the garden, and I have often had it so weak that it would not ferment when moist, mix half a peck or more of good guano in a load. The mass will soon heat then, and eventually its value for the land will be a good deal more than doubled. Instead of conflict between natural and artificial manures we then have combination, and the union is a happy one for whatever crops are fed with the preparation.

But how should we feed? By placing what is good for plants within immediate reach of the roots at the moment of their formation. I do not say have the soil poor below; on the contrary, have it as rich as the crops need; but do not, as many do, forget the surface; also remember that young plants like quick-acting nitrogenous rather than slower mineral food. The advantage of a good, free start in growth cannot be over-valued, and the start is often slow and weak in strong land, and always so in poor soils. Collect decayed leaves or other vegetable matter, wood ashes, light soil of any kind, with a dash of soot, and mix well. When moist, and only then, pour on liquid manure, such as drainings from heaps, or, what is very good, half an ounce of sulphate of ammonia to a gallon of water. A few weeks later, when the time of sowing comes, draw deep drills, fill with this mixture, which should then be nearly dry, and in it sow the seed. That is food for infant plants, and they thrive on it. This little attention at the outset may

make all the difference between success and failure with certain crops in naturally poor or ungenial soils.

And now we come to the least in bulk of all the essentials for healthy crops, but of the greatest importance—fresh, strong, well-fed seed. This can only be produced from plants grown specially for seed, in the best of soil, well stored with the ingredients for perfecting it. Weak pods of Peas from starved plants—and it is the same with everything else—represent degeneration. I have seen crops from seed of the same varieties of vegetables, sown at the same time, side by side, one weak and the other strong, one unprofitable and the other profitable, one to which the grower pointed with pride, the other with annoyance. The difference was due to the seed, and the seed alone. Let this be of the best, the soil be in the best mechanical condition, and stored with manure containing the elements of nutrition, and the best of vegetables will be produced. It is not necessary to have fanciful mixtures for every crop, nor does it follow that lavish applications produce corresponding results. While sufficient should be provided, more than enough is waste, for, as Dr. Masters says in “Plant Life,” “particular species take what they want and take it when they want it, not being induced to take more by the addition of larger supplies.”

Just another sentence or two. Quick-acting nitrogenous manures, such as nitrate of soda and sulphate of ammonia (the former for light and dry, the latter for heavy and cold soils), should be applied at the rate of $1\frac{1}{2}$ to 2 cwts. per acre, or $\frac{3}{4}$ oz. to the square yard, early in the season to growing crops, never late in the autumn; phosphatic and potassic manures in thrice the quantity earlier still, before growth commences and before dry weather sets in, or they cannot be appropriated by, because not dissolved in time for, the crops they are intended to support. Chemical manures have often been condemned as worthless, when the fault rested with the users in simply applying what was really good at the wrong time for attaining the object in view.

It is scarcely necessary to dwell on the value of liquid manure in summer, but it may be stated that, instead of the drainings from manure heaps, and the contents of cesspools, being wasted in winter, as is not uncommon, they should on suitable occasions be poured on vacant (drained) land; the virtues of the liquid will

be absorbed and retained by the then moist soil for the certain benefit of after-crops. These remarks are founded on practice. I think they cannot do harm to anyone, and may possibly be suggestive to some who may engage in the cultivation of food-producing crops.

DISCUSSION.

The CHAIRMAN (Mr. Shirley Hibberd) remarked on the too frequent neglect of lime as a corrective of acidity, and a promoter of useful chemical changes in the soil, as well as a necessary plant food; and he directed attention to the important subject of the derivation of nitrogen by the roots and leaves of plants as bearing direct relationship to the commercial value of manures.

Mr. G. WYTHES said that wood-ashes should be used for manure, especially in old gardens. Wood-ash, soot, and lime were better than farmyard manure.

ON THE IMPROVEMENT AMONGST PEAS DURING THE LAST QUARTER OF A CENTURY.

By Mr. T. LAXTON, F.R.H.S.

THE Pea is so well known as constituting an important part of the vegetable food of the inhabitants of this kingdom, and is so highly appreciated by all classes of the community, that I think the committee of this Conference has acted wisely in giving the subject prominence; for although the time of year for practical illustration is somewhat inconvenient, the opportunity for discussion is appropriate, and it cannot be surprising that the matter should have a peculiar fascination for the writer, who has, during thirty years, found Pea breeding and selecting a laborious and interesting, if an unprofitable, occupation.

Time and the syllabus set before me will hardly permit of more than a cursory glance at the work which has been done towards the improvement of Peas during the period covered by my paper, for it is probable that in this time more has been effected than was ever previously attempted. The work has chiefly been confined to this country, but recently cross-breeding and selection of Peas has to some extent received successful attention in the United States and Canada, where Peas would seem also to be popular. On the continent of Europe, with the exception of the

well-directed efforts of Messrs. Vilmorin, of Paris, and a few others, I am not aware that much has been attempted, the requirements for Green Peas and their use being there different from and much more limited than in Great Britain—Peas, as we know and grow them, are essentially a favourite vegetable of John Bull and his relations.

It will be neither possible nor necessary for me here to enter upon a discursive history of the Pea, but authorities affirm that its origin has been lost in obscurity. Certain it is that it was known to the Egyptians, Greeks, and Romans, and probably to our Saxon forefathers and the prehistoric occupants of the Lake Dwellings.

Botanically, the Pea (*Pisum sativum*, the Garden Pea, including *Pisum arvense*, the Field Pea, as a variety only) belongs to the natural order of the *Leguminosæ*, and has a papilionaceous flower, the corolla being formed of a large and, when expanded, erect back petal called the standard, two wings, or side petals, and the keel, consisting of two smaller petals united in front; these enclose a style with a carpel or legume (the incipient pod), and ten coherent stamens, five long and five short. Fructification or fertilisation of the Pea, as with some other papilionaceous flowers, takes place naturally, when the blossom is yet unopened and about half-sized, and a day or two before it expands. The original plant was most likely, in its normal state, of a tall scandent or climbing habit, the stalks of the compound leaves of all the varieties, whether dwarf or tall, terminating in tendrils which enable the plant to grasp neighbouring objects for its support. I take it, then, that all dwarfing is unnatural, and has been secured by cultivation and selection; this feature, nevertheless, proving an advantage in many cases to the gardener, and a consequent improvement. On the other hand, a fair length of straw is often of material value to agriculturists and large growers of Peas for boiling, &c.

Taking the Pea as a cultivated food-plant, we may divide it into two sections—*Garden* and *Agricultural*. These are again usually separated into early, main-crop, and late varieties, according to their respective periods of maturing; into tall and dwarf sorts, according to the length of straw; and into wrinkled and round or plump and indented seeded kinds, as indicated by the shape and appearance of the seed.

GARDEN PEAS.

Garden Peas may be again divided into

Shelling Peas, containing such as are used for shelling green ;
Boilers, which are those varieties usually grown in large breadths for their seeds to be used for soups and culinary purposes in the dry state ; and

Mangetout or *Sugar Peas*, which have thick and fleshy pods, which in some parts are cooked and eaten green with the Peas, in the same manner as we use Runner and French Beans.

In prospecting for improvements in *Shelling Peas* we have to look to the purpose for which the particular variety will be useful. I propose, therefore, dividing them again into three gastronomic classes, with names which I shall call as follows :—

CLASS I.—*Lamb Peas* : those usually eaten in the early season and in this country frequently with lamb, and consisting of the smaller round and wrinkled seeded early varieties—the *petits pois* of the French—and which require to be gathered and eaten young.

CLASS II.—*Ham* or *Bacon Peas*, which are generally required and liked of a more farinaceous nature, as eaten with ham or bacon, and which may be used when somewhat more mature than those of Class I., and for this purpose the main or second crop round or plump seeded sorts are best adapted.

CLASS III.—*Marrowfats* or *Quality Peas*, which include those of a rich and sugary flavour and buttery texture, and are usually of the larger wrinkled seeded and mostly main-crop or late varieties.

From this classification it will be seen that a Pea, although good for Class I., would be unsuitable for the purposes of Class II. ; and that the varieties in Class II., although useful and desirable Peas, would be unfitted for the purposes of Classes I. and III. This classification will also tend to show that for all these purposes, as well as for the many variations of climate, position, and seasons for which the British gardener has to provide, a great many sorts of Peas are necessary ; and if all these requirements are to be met, a good many varieties must yet continue to be grown, and it will be impossible to limit ourselves to the half-dozen varieties, more or less, so often urged as sufficient.

Boiling Peas, usually known as “Boilers,” and used for

cooking in the dry state, split or whole, are usually obtained from the large and plump seeded hardy and heavy-cropping sorts, such as the Blue Imperials.

Sugar or *Mangetout Peas*, with thick and fleshy pods, although largely used on the Continent, may be dismissed as almost unknown in English cookery.

AGRICULTURAL PEAS.

Our second principal division of the cultivated Pea, although strictly within the limits of my paper, can only claim a passing mention here, as but little improvement has been attempted amongst them—an advance in earliness only, as hereafter shown, having been secured.

I will now endeavour to see in what directions improvements in the Garden Pea should be looked for. These appear to me chiefly to be—

In Shelling Peas :

Increased precocity and earlier and later fitness for gathering green, coupled with a hardier and more vigorous plant.

Increased productiveness, especially for market and large culture.

Larger size, with ample filling of the pod and proportionate size of the Peas; and especial attention to the beauty and colour of the pod for market purposes.

A more continuous period for gathering green in the second early, main-crop, and late classes; and in some cases

A more protracted and simultaneous maturing amongst the earlies, in order that the ground may be quickly cleared for re-cropping.

A reduction of the extreme leafy propensity in the later varieties, so as to counteract mildew.

And where large pods have been obtained through the intervention of the Sugar Pea, to endeavour to reduce or eliminate the excess of thickness and fleshy substance of the shell.

In Boiling Peas :

Increased productiveness and hardness of plant, combined with a fair length of straw and easy solubility in cooking of the ripe seed, which should be also of good size.

And all new introductions should be capable of setting their flowers freely in moist weather.

We now come to the means by which these advantages have been and are hereafter to a further extent likely to be secured.

Firstly, by selection, following a rare natural or insect cross-fertilisation, but more generally by watching the natural tendency of the Pea to vary and run back or revert; and, secondly, by artificial cross-fertilisation and carefully continued selection.

Regarding natural or insect cross-fertilisation in the Pea, I had, up to a recent period, concluded that it was practically impossible, but later observations have tended to modify that opinion, and I now hold that this does occur more often than had been anticipated, through the agency of thrips and other minute insects, which appear to feed on the pollen prior to the expansion of the flower; and that the presence of "rogues," as the irregular plants are termed, in a crop of Peas is sometimes due to this agency. Up to the beginning of the present century selection was probably the only means by which the then varieties of Peas had been obtained; but about that period the great master of horticulture, the late Mr. Thomas Andrew Knight, President of the Horticultural Society of London, turned his attention to the artificial cross-fertilisation of Peas, and with what good success is attested by his famous tall and dwarf marrows, still grown and in vogue in some localities. The work was subsequently taken up by the late Dr. McLean, of Colchester—who must be considered the father of modern Pea improvements—and has since been largely continued by numerous workers, whose productions have become mostly available during the past twenty-five years.

During that period the writer alone has, wisely or unwisely, contributed to the ever-increasing catalogues about fifty existing or departed varieties. It will therefore probably be expected by practical listeners that I should briefly state the means adopted; and as I have during that period effected some hundreds of crosses between most of the best and approved sorts of Peas, the crosses in many cases being repeated and reversed, and all recorded, I will describe the mode of procedure in artificial cross-fertilisation of the Pea, an operation which has frequently been considered a difficult one, but which in fact, where a good eye, steady hand, and a pair of small sharp-pointed scissors are available, will with but slight practice be found a very simple one.

As I have previously shown, natural fertilisation usually takes

place in the flower of the Pea before expansion, and therefore, in order to secure a successful cross, the operator must let his work precede this, and it will be necessary to operate two or three days prior to the opening of the flower, and when the incipient blossom is about one-third its mature size. This is done by carefully slitting up with a scissors' point the front of the keel petal and removing the anthers before the pollen be shed, for should this have taken place in the slightest degree, it will be well to abandon the operation and recommence on another flower. The foreign pollen of the desired variety can then be applied through the opening made in the keel of the flower to be fertilised, either from a camel's-hair pencil or by direct application of the ripened pollen-bearing anthers to the upper edge of the carpel. This is best accomplished by an easily acquired movement of the thumb and finger of the right hand holding the pollen-bearing flower, the keel of which, with its point inserted in the opening made in that of the flower to be operated upon, may be drawn back over the anthers, and the pollen will be delivered by a jerk or spring into the desired position. I rarely use a camel's-hair pencil in cross-fertilisation, as it brings considerable risk of introducing other pollen or undesirable foreign matter in combination with the pollen to be used. After the operation has been performed, it will be desirable to pinch out the crown and all the flowers and pods on the plant except those cross-fertilised. If in conducting the operation care has been taken not to injure the organs of fructification, and these are in ripe condition, and sufficient pollen has been applied, the pod, if the weather be not too wet or moist, will probably set, and in due course ripen its complement of seeds. By means, however, of cross-fertilisation alone, and unless it be followed by careful and continued selection, the labours of the cross-breeder, instead of benefiting the gardener, may lead to utter confusion, because, as I have previously stated, the Pea under ordinary conditions is much given to sporting and reversion, for when two dissimilar old or fixed varieties have been cross-fertilised, three or four generations at least must, under the most favourable circumstances, elapse before the progeny will become fixed or settled; and from one such cross I have no doubt that, by sowing every individual Pea produced during the three or four generations, hundreds of dif-

ferent varieties may be obtained ; but, as might be expected, I have found that where the two varieties desired to be intercrossed are unfixed, confusion will become confounded, and the variations continue through many generations, the number at length being utterly incalculable.

We must therefore still largely look to selection as the final means of obtaining permanent improvements in the Pea, and I fear the results of the recent work of Pea-crossers can hardly be fully appreciated for some years to come, during which their labours must be carefully followed by those of the seed-grower.

To the late Dr. McLean I am deeply indebted for the introduction of his then fine new varieties, Little Gem and Advancer, the blood of which being mingled with that of my own Prolific Longpod, raised in 1858 by crossing Sangster's No. 1 with Beck's Prizetaker Green Marrow, formed the base of a good many of my earlier productions. Alpha originated from a cross between Little Gem and Ringleader. William the First comes from Little Gem and Prizetaker, and Supreme from Advancer and Prizetaker. Subsequently, with a view of increasing the size of the pod, I introduced the blood of the large tall Sugar Pea, which led to the production of Superlative ; and although this Pea was much abused for its fat sides and puffy interior, it served its purpose, and has left its mark unmistakably in the increased size of the pod of many of our best newer varieties, and has since been well displaced by its more comely progeny.

My own endeavours have been directed chiefly towards gaining in earliness with both garden and agricultural Peas, towards the increase of size, well-filling of the pod, improvement of the quality, and to the production of later garden varieties, and these of moderate height, so as to continue the supply of Green Peas over a longer period. Recalling advances made in earlier maturing, I may refer to Laxton's Earliest of All and Harbinger (now more generally known as Eclipse) as earlier round blue-seeded half-dwarf garden varieties, equalling if not exceeding in precocity Dillestone's Early Ringleader, or Prince Albert ; to one new agricultural variety, Laxton's Early Maple, obtained by crossing the old Maple, or Partridge Pea, with Ringleader, and in precocity quite equalling the earliest garden Pea. Amongst dwarf Peas to American Wonder (apparently a reproduction of the original type

of Little Gem), Multum in Parvo, William Hurst, and Chelsea Gem, all excellent early dwarf wrinkled sorts, and Blue Peter, a good round blue dwarf variety. Laxton's No. 1 (the wrinkled form of Harbinger), Alpha, and Dr. Hogg, as good quality half-dwarf wrinkled earlies, preceding most of the old round early white Peas; but, although possessing higher quality, combining more tender constitutions, a defect which seems almost inseparable when high quality is sought to be coupled with precocity; these early wrinkled Peas having also, during our cold-protracted springs, to contend with slugs, snails, birds, and insects, who all appear able to distinguish between these and the round varieties, and to single out the more tender and sweeter plants of the wrinkled forms. We have, however, in William the First, and especially in its recently re-selected earlier and originally dwarfer form, a decided advance in quality, fertility, and beauty of pod, combined with a good constitution and in earliness approaching Earliest of All, and the earliest round white varieties, the ripe seeds of William the First being of an indented or semi-wrinkled character. I might mention that this Pea, originally $2\frac{1}{2}$ feet in height, had in some trade stocks become fully 2 feet higher, and probably it will ever require constant and continuous selection. Other promising and larger-podded and larger-seeded early sorts, including Gradus, will doubtless soon be forthcoming, but as such are not actually in commerce, time alone can justify their adoption into the Horticultural Studbook. It is, however, in the second early and main-crop varieties that so much has undoubtedly been achieved in increased size and beauty of pod.

To Mr. Culverwell we are largely indebted for these. In Telegraph he gave us a decided improvement in size and beauty of pod and a good and useful Pea. From this would appear to have been selected the fine large-podded dwarfer varieties, Stratagem and Pride of the Market, which in some seasons are unapproachable as half-dwarf, large-podded main-crop varieties. Telephone and Duke of Albany seem also to be results selected from the same cross, each of which are material gains on Telegraph, Telephone being a wrinkled form of that variety with a paler pod, and Duke of Albany wrinkled with a dark-green pod. This Pea in most respects approaches nearly the highest standard

possible in main-crop Peas, as the pods are very large, handsome, of good colour and well filled, the quality excellent and fertility fair, the straw being also of moderate length, the only shortcoming appearing to be a constitution which renders it unfitted for some seasons and situations. Many other second early and main-crop sorts, with fine pods and showing advances in one or more directions, have been obtained, notably Paragon and Alfred the Great as earlier editions of the Telephone type ; and amongst the useful, hardy, and free-bearing 3-foot Peas of medium season, introduced during the period covered by this paper, I may note Prince of Wales, Fillbasket, Invincible, and Laxton's Standard (now more generally known as Wordsley Wonder), Dr. McLean, and G. F. Wilson, and two good all-round 4-foot Peas in Mr. Standish's Criterion and Laxton's Charmer, both high quality, handsome, and productive wrinkled sorts, and whose merits have hardly been fully recognised. Amongst the later main sorts we have John Bull, a fine half-dwarf wrinkled Pea, but of an over-leafy habit, and consequently succeeding only in certain seasons and localities. In the later varieties we have gained Superiority (Eckford) and Walton Hero (W. H. Laxton), both, I believe, from crosses between Telephone and British Queen, and advances in size and earliness on that much-approved tall Pea. Amongst the latest Peas we have added Omega, Latest of All, and Perpetual-bearer, all dwarfed types of the well-known Ne Plus Ultra, and to these no further commendation can be accorded, for undoubtedly Ne Plus Ultra, syn. Jeyes' Conqueror, or rather its broad-podded selection, known formerly as Buckley's General Wyndham, is still the Pea of Peas ; but though Ne Plus Ultra is of high quality and good-looking, it is tall and very late, and we still want its earlier and dwarfer prototype, which will probably be soon provided for us in some of the newer varieties not yet thoroughly fixed. Lastly, we have the remarkably fine but unfixable Pea, Evolution.

In the endeavour to enumerate the principal introductions of the past twenty-five years, I fear I may have unintentionally omitted some sterling varieties, but, as my experience is only limited, I must ask your indulgence and correction. For the purpose of comparison I have drawn up from my own recollection, and the slight sources of research open to me, the following

list of some of the best and most popular varieties of Garden Peas previously in cultivation :—

POPULAR GARDEN PEAS IN CULTIVATION ABOUT 1864.

Early varieties.

- *Dillestone's Early, Ringleader
Double-blossomed Frame
- *Sangster's No. 1, Daniel O'Rourke
Early Emperor
Danecroft Rival, or Early Dane-
croft
- *Advancer
Tom Thumb
- *Little Gem (?)

Second early varieties.

- *Prizetaker, Defiance, Rising Sun,
or Bellamy's Green Marrow
Dickson's Favorite
- *Champion of England
Auvergne
Fairbeard's Surprise and Fortyfold
- *Harrison's Glory and Perfection
Burbidge's Eclipse
- *Blue Prussian

Main-crop varieties.

- *Blue Scimitar
- *Bedman's Imperial, Imperial Blue
Woodford Marrow
James' Prolific
- *Veitch's Perfection
- *Yorkshire Hero, Hair's Dwarf
Mammoth

Late varieties.

- *British Queen, Ward's Incompar-
able
Tall Green Mammoth
- *Ne Plus Ultra, Jeyes' Conqueror,
General Wyndham
- *Knight's Tall White Marrow
- *Knight's Dwarf White and Green
Marrows

and out of these I believe the varieties marked with an asterisk (*) are still grown on a considerable scale, and that few only in the list have become altogether displaced.

Comparing the above with the recent introductions referred to, it will be seen that we have added to our useful Peas good first early round and wrinkled blue-seeded varieties, a good early indented green marrow, and several fine early dwarf wrinkled and round varieties for garden and market culture.

Amongst second earlies we have gained both in size and filling of the pods, and in fertility and hardiness. In the main-crop sorts perfection in size and beauty of pod has been nearly approached, and in the direction of new late Peas we have reduced the height without loss of quality, by the introduction of the dwarfer types of Ne Plus Ultra, and in the British Queen race we have advanced somewhat in earliness and size of pod. Great further gains have doubtless been obtained in the fine varieties recently certificated by this Society, but whose good qualities have not yet been fully realised; and although it has often been urged that we are getting too many new Peas, it is necessary that a good many should be brought forth, in order that, after a crucial trial of years, which can only be carried out by the public as consumers and by growers in quantity, the fittest

alone may eventually survive, for it can hardly be expected that more than a good percentage will reach that enviable position, as in every new introduction, however sanguine its foster-parent may be, the public test will frequently bring to light some unlooked-for weakness, rendering it only partially fitted, or totally unfitted, for its intended position.

When, therefore, we consider the advances made, the numerous requirements for improved varieties adapted for particular purposes, soils and seasons, and the loss by natural elimination, one improved variety soon becoming displaced by a better, I think Pea-raisers have done only what was necessary to keep pace with the times; they have achieved many advances, and have in the numerous cross-fertilisations laid the foundations for still greater improvements, but there is scope for new work in the direction of greater hardiness or improved constitution and fertility. The gain in large well-filled pods has sometimes been the subject of ridicule, but where Peas are grown by the acre, and the produce reaches several hundreds of bushels, *1d.* or *2d.* per bushel saved in gathering may often represent an average rent of the land, and the time saved in shelling the larger-podded Peas is also of some value. The advance, therefore, in the size of pod has been consequently a material improvement; gain in earliness is also well appreciated both by the consumer and the grower; to the former a few days gained often represents by no means a trifling profit, it may double or treble the value of the crop. I maintain, therefore, that we have secured during the past quarter of a century many important and material improvements in our favourite vegetable—the Pea. But we have yet room for new varieties, especially in the production of good hardy Market Peas, with large handsome deep-green pods, medium short-jointed straw, and producing freely at each joint from the ground upwards; and for market purposes it is essential that the pods should be of a deep-green colour, for however good the quality may be, the higher-coloured sorts will always command a higher price. The producer of such a Pea would not only benefit himself and the consumer, but if he can add a hundred, or even fifty, bushels of green pods per acre to the present yield, he may put into the pockets of the grower an additional £5 or more per acre, and at the same time do something towards counteracting the present depreciation of the land.

For other reasons besides those I have mentioned, the labours of the grower and selector ought never to cease, for the character of precocity in the Pea gradually becomes reduced. If all the advances in earliness claimed during the past twenty-five years were added together, each new early variety generally aspiring to be from seven to fourteen days ahead of all its compeers and predecessors, early Peas would now come in with the new year; but, in fact, these allegations are not altogether wide of the truth, for those who grow early Peas largely will probably have noticed that certain portions of the stock ripen off before the bulk, and shell out and are lost before the crop can be harvested, and this process being frequently repeated the stock ultimately loses considerably in earliness. Similar loss also arises from the attacks of birds, mice, &c., on the earliest pods; and again, when early Peas are gathered green, the first gatherings include most of the earliest to ripen, and the remanent, consisting of the later, is often saved for seed. In reality, therefore, there is ground for the claim of extra earliness, the new foundling being in advance to some extent of the old stock or sort, which has not been carefully preserved or selected. This loss is a constant one, and has to be met either by the selector or cross-breeder. A similar process also goes on with regard to the height of Peas; the dwarfer plants get lost or left in harvesting, and ultimately the stock consists of its longer-strawed portions only. We must therefore ever be watchful and on the move in order to counteract these persistent tendencies to deterioration of our existing stocks of Peas.

DISCUSSION.

Mr. A. W. LEMAITRE said he was an amateur grower of Peas, and had never succeeded in buying Peas which kept to the advertised height. He thought seedsmen should state in their catalogues the nature of the soil in which the different kinds of Peas should be sown.

Mr. DUNN said that we had had many good Peas introduced during the last quarter of a century, but he did not think there were any new Peas which yielded earlier or later than formerly. The Ne Plus Ultra was still unequalled. For practical purposes there were four classes into which Peas could be divided:—
(a) first early Pea; (b) second early Pea; (c) main crop; (d) late Pea.

Mr. R. DEAN deprecated the inordinate size of modern catalogues as calculated merely to bewilder the unpractised buyer, and referred to a catalogue of the year 1817, in his possession, in which 30 varieties of Peas were mentioned; and one of Jas. Carter, 1832, measuring 7 by 5 inches, in which 42 varieties were named. He said that in 1852 these had increased to 111, and that at the present day the number was considerably more.

POTATO IMPROVEMENTS DURING THE PAST TWENTY-FIVE YEARS.

By Mr. A. DEAN, F.R.H.S.

IN dealing with this subject it is worth starting with the proposition that the Potato, so far from becoming in any way deposed from its pride of place amongst vegetables, remains still the premier, for its popularity has rather increased in the community, and high appreciation for it as an esculent is greater than ever. Emphatically the Potato is the most important of all our vegetables, using the term as employed generally at this Conference. We never tire of it—we eat it all the year round, not because we have no other option, but because we love it. It is a very remarkable feature of the Potato as an edible product that it never satiates. We may tire of Beans, Peas, Cauliflowers, and all other of the rank and file of the vegetable army for a time at least; but our fancy for good Potatoes, like Tennyson's brooklet, "goes on for ever," and if I may venture to prognosticate, I would aver that Potatoes will still be food for man when the crack of doom shall come.

Perhaps, in one respect, we are a little inconsistently fastidious, as, whilst we prefer greatly to have Potatoes starchy, we object to have them soapy—in other words, they may be floury, but must not be watery. We are not tied to one method of cooking Potatoes either, to have them presentable, and therein again lies one element of the eternal popularity of the Potato. We can vary its method of dressing or serving up infinitesimally. It will bake, it will boil, it will fry, it will mash, it will *fricassée*, it will make cakes or pies, it will bear cooking in a score of fashions, and we never tire of the methods. Least of all, however, none tire of

Potatoes boiled or steamed, and served up whole on the dinner table; in fact, we make Potatoes in this form as much a standing dish as we do the loaf of bread on our breakfast tables. We have many diverse uses for the Potato, such as converting it into that useful element in our underclothing, starch, wherewith to give us a little stiffness when we are naturally disposed to be limp. We convert it into alcohol, and help in that way to furnish the devil with a good share of the sons and daughters of Adam. We have worthier purposes, however, and desiccate Potatoes, so as to make them into a valuable healthy food for exportation or use for our soldiers and sailors under conditions of existence where green fresh foods are not obtainable. Whatever may be the response to the question to which I have to make reply, at least I have shown that the uses of the Potato are most varied, and probably considerably exceed those referred to.

Now, twenty-five years ago we had no great wealth of variety in the Potato, and it is a significant fact that with the exception of the Ashleaf Kidney, a sort which has kept its place chiefly because hitherto there has been a lack of first early varieties, there is hardly to be found in seed Potato lists one then in ordinary cultivation. It is still very much the fashion on the part of those who sigh after the days and years that are gone, to declare that none of the modern Potatoes equal in quality the Regents, Lapstones, Fortyfolds, and other sorts of the past. Whenever I hear of the passing away of men of whom it may apparently be said their places cannot be filled, I am consoled with the reflection that the famous old proverb has never been belied, "There's as good fish in the sea as ever came out of it." Just so is it in the Potato family. We have had since the date I refer to myriads of good Potatoes introduced, and plenty of bad ones. We have myriads of good Potatoes now also, and a far less number of bad ones, and we have at least an abundance of varieties which, whilst equal in quality to the best of bygone days, do by far excel them in robustness and productiveness. Old age in man is apt to make many a good thing taste bitter in the mouth which seems sweet and pleasant to youth, and were I to aver that now to me there are no such Apples as I found in boyish days, I should fitly be laughed at, for we have now such Apples as could hardly have been dreamed of fifty years ago; and yet my complaint would in part be true, because I have

changed and become old and incapable of extracting from Apples that delight found in the greenest fruit half a century since. That is, I believe, very much the case with those who condemn the Potato of to-day when compared with those of earlier years. The Potato really has improved—the eaters of them have become less capable of appreciating them.

Then there has been no inconsiderable improvement in form and beauty. Those who saw, and, having seen, remember the singularly beautiful tubers shown at the various exhibitions held under the auspices of the International Potato Show Committee, must in all honesty admit that in development of form wonders have been worked during the past twenty-five years. To aver that under the influence of those shows Potatoes reached absolutely the perfection of form in their respective sections is to speak a truism, and, as a consequence, the Committee, having accomplished all that was possible, retired from its labours satisfied with its results. “But,” exclaims the Potato pessimist, “beauty of form and smoothness of skin is no evidence of quality!” Perhaps not; but, on the other hand, neither is ugliness. If we have had some beautiful Potatoes of bad quality, we have also had myriads of good ones, and the efforts of the International Committee were specially directed to the elimination of the bad and the expansion of the good, not only at the Crystal Palace, but through the kindness of the Royal Horticultural Society in these gardens also. Form and beauty, beyond satisfying the requirements of the cultivators of refined tastes, have become marketable commodities also, for the handsomest samples always secure the best prices.

One of the chief factors in Potato development during the time previously named, however, was found in the introduction of American varieties. These came to us in myriads, generally characterised by similarity of appearance, but varying, perhaps, in colour. All were remarkable croppers, and if few possessed high quality or flavour, yet all did materially help to swell our Potato supplies. How many of these varieties, introduced at the time with much flourish of trumpets, have now gone to the eternal Potato bourne our lists of to-day will serve to show. Just one or two remain to us in their natural form and goodness, chief amongst which is the favourite Beauty of Hebron; the best, perhaps, as it has been the most permanent, of all the

family. But our home raisers awakened to the need of doing something to counteract the flooding of our trade with American sorts; and further, alive to the value of these strangers as parents of better strains, they utilised the best for seed-bearing purposes, fairly skimming the cream off them and casting the residue aside as worthless.

Our esteemed friend, Mr. Robert Fenn, who had at Woodstock been raising varieties which were perfect in quality, but lacking in robustness and productiveness, was one of the first to utilise American varieties as parents. Many others presently followed suit, with the result, briefly put, that dispensing with all old sorts, and nearly all American varieties, we have a race of Potatoes which is productive, robust, gives good quality, and supplies the tables of the poorest in the land cheaply and abundantly. But apart from the Americans, which in spite of their comparative robustness still succumbed wholesale to the deadly effects of the *Peronospora*, there was this very fungus with all its dire destructiveness constantly forcing upon Potato growers the need for battling with it for the preservation of our Potato stocks. It is idle to regard it as other than a terrible and a disastrous visitation, and in years past, when we had none other to depend upon but Regents, Fortyfolds, Victorias, and similar tender though delicious varieties, there was at times reason to fear that the Potato crops of the kingdom would be absolutely decimated.

Here was opportunity for a display of that native force which makes the modern Briton the compeer of the ancient Roman. To comparatively conquer, if not absolutely to subdue the insidious foe, was a feat worthy of accomplishment, and I believe, comparatively, that great feat has, thanks to the persistent efforts of the Potato raisers more than to any other body, been accomplished. Let it not be forgotten that no other vegetable has had such a deadly enemy to contend with as the Potato. Remembering still further how deeply the tuber is associated with the feeding and the health of the community, there was found special stimulus for labour in the direction of subduing the disease. Scientists told us what it was they could do, but the more practical men have striven to battle with it, and the honours of victory, so far as they have been won, rest with the raisers of the varieties more than with any other class.

One of the first products of the Anglo-American Potato crosses was that famous variety, *Magnum Bonum*. Its history is pretty well known; but in referring to the improvements in Potatoes during the past twenty-five years, it would be impossible to omit reference to a variety which has proved to be so important a factor in the work of disease resisting, and practically of conquering. Raised from the seed produce of the *Early Rose*, assumedly crossed with the *Victoria*—a once famous Potato, but now rarely met with—by Mr. Clarke, of Christchurch, it became so widely known and grown in a few years, that probably it made more noise than any other Potato ever introduced to commerce. Fortunately for Mr. Clarke and the community, tubers of it and other varieties were sent to that once famous trial ground at Stoke Newington, over which Mr. Shirley Hibberd was the presiding genius; and so much was that gentleman taken with the variety, that he introduced it to the Messrs. Sutton & Sons, of Reading, who purchased the stock. It is said of the University of Utrecht that over its portals ran the inscription, “Utrecht planted me, Louvain watered me, and Cæsar gave the increase,” to which some wag is reported to have added, “God did nothing there.” Now of the *Magnum Bonum* it may be written, “Clarke raised me, Hibberd selected me, Suttons distributed me, and God gave a wonderful increase,” for is not the variety at the present moment more widely grown than any other to be found in commerce?

But even in raising a variety which presented so formidable a barrier to the progress of the Potato disease, there were not wanting critics who railed at its quality. If half a loaf be better than no bread, surely a whole one is better still; and that much did *Magnum Bonum* give to myriads of Potato consumers, to whom in previous years the tender old kinds of Potatoes, under the deadly effects of the disease, gave no loaf whatever. It is, however, worthy of remark that, in spite of the critics, the *Magnum Bonum* is more largely eaten now than any other Potato. But having found so admirable a barrier against the tide of fungoid decay, raisers have not been slow to take advantage of it for the purpose of producing many other disease-resisting kinds, and possibly of much superior quality. We have now not one, but a wealth of disease resisters, and because of them have such

an abundance of Potatoes that they can hardly be disposed of at any price. Really, the salvation of the Potato, and of the consumer, has been the ruin almost of the trade, for with stocks so plentiful few want to purchase, and trade is almost unprofitable to growers.

Why, in the old disease days, before *Magnum Bonum* and other fine sorts came to our aid, we imported thousands of tons of Potatoes during the winter months from Germany, Belgium, and elsewhere. That trade has been entirely suspended, for the excellent reason that we grow plenty of Potatoes at home, not only for our consumption, but have an abundance to spare. It is true we import large quantities of early Potatoes from France, the Channel Islands, &c., but their consumption in preference to good home-grown old tubers displays a sadly vitiated taste, as in most cases they are more fit for pigs than for intelligent men. Mr. C. Fidler, of Reading, one of our great dealers in Potatoes, as well as an extensive grower, has informed me that the average price of Potatoes now in the market is fully 30 to 40 per cent. lower than it was ten years ago—a fact which speaks volumes for the wonderful development of Potato production, the result of the possession of numerous disease-resisting varieties.

The following lists of sorts affords some evidence of the change which has been effected in Potatoes within the past comparatively few years: *Beauty of Hebron* and its white variety, *Webber's White Beauty*, a distinct early sort; *Sutton's Early White Kidney Seedling*, *Satisfaction*, and *Abundance*, all robust and great croppers; *Snowdrop*, *Schoolmaster*, *Magnum Bonum*, *Vicar of Laleham*, *The Dean*, *Reading Russet*, *Prime Minister*, *Chancellor*, *Reading Giant*, *White Elephant*, *Imperator*, *The Daniels*, *Lye's Conqueror* and *King of Russets*, *The Governor*, *The Bruce*, *Stourbridge Glory*, and many others, nearly all great croppers, and creators of that wealth of Potatoes which contrasts so wonderfully with the comparative dearth of twenty-five years since.

HOW TO MAINTAIN A SUPPLY OF VEGETABLES FOR FAMILY CONSUMPTION THROUGHOUT THE YEAR.

By Mr. J. SMITH, F.R.H.S., Mentmore.

A BOOK might be written on this subject; in fact, many books have already been written giving the history and cultivation of each known vegetable. In the short time allowed for this paper it is impossible to give full details of each kind of vegetable that should be grown to sustain a regular supply all the year round. I can only indicate the lines to adopt to secure the end in view. The garden may be large or small, according to the demands and the means allowed for cultivating it. One acre of ground well cultivated will produce more vegetables than two acres half cultivated, besides being a far greater pleasure to the owner. So that whatever may be decided upon as to the extent of ground set apart for producing a supply, let it always be of the very best quality at command, and receive as much attention as the choicest flowers or fruits in the garden.

The aspect is a very important point. South or south-west is perhaps the best; if the latter can be secured so much the better, as the two walls facing south and south-west can be used for growing choice fruits, such as Peaches, Plums, Cherries, &c., &c., and the borders will be invaluable for early vegetables. I need hardly mention the subject of heavy manuring, as this is so well known to every practical gardener. Suffice it to say that really first-class vegetables cannot be grown without an ample supply of good manure. "A large dunghill, a large crop," is an old saying and a true one. Give plenty of manure, dig often and well—not surface-digging, but 12 or 18 inches deep, according to circumstances. Trenching is a very important operation with all good cultivators. However, both digging and trenching are now so well understood that they require no comment from me. Next in importance comes mulching, which keeps the moisture in the ground; this operation is of far more importance than is generally recognised, as it not only keeps the roots moist in summer, but it protects them from frost in winter. Litter from the stable is the best for keeping out frost, but for summer mulching there is nothing better than

cow-dung. Some object to this on the point of appearance, but this can be obviated by covering the dung over with a little soil. Surface-stirring is another important element within the reach of all cultivators. If the surface of the ground is allowed to become battered and cracked, the moisture escapes and the plants suffer. A three or four-pronged fork is the best for surface-stirring; light hoeing in dry weather destroys weeds, but to assist the plants the crust should always be well broken up. It is a well-known fact that soil is the primary agent in the cultivator's hands in producing fresh vegetables, and, where it is of the right quality, it is an easy matter to produce good results. When of a poor and barren nature, skill and energy is wanted to improve it, so that the soil may be rendered suitable to sustain plant-life.

I shall not enter on the thorny path of recommending any particular varieties of vegetables, as that is far beyond the scope of this paper; but, in passing, I may remark that it should be the aim of every grower to secure those particular varieties of vegetables that are most appreciated by those he has to supply, and that grow best in the locality in which he is placed.

I shall now proceed to give a summary of the different kinds of vegetables that should be grown in order to sustain a constant supply for the year, and, as far as possible, name the month they should be sown and the probable date when they become fit for use.

Peas.—This is the most important of our summer vegetables. Seed may be sown on warm and dry borders the end of November. These should, as a rule, be ready for use the last week of May or the first week in June. Another sowing should be made in January, and in ordinary seasons these will follow close on the autumn crop. From January onwards a regular supply should be sown at short intervals till the end of July; by this means a supply can be kept up till the end of October. This crop requires ample room between the rows, with good rich soil, and heavy mulching and watering in dry weather. Season out of doors, June till October.

Asparagus.—A first-class vegetable, for which there is always a demand, especially as it can be produced to cover most of the period when Green Peas are out of season. Rich ground must be provided to grow this crop to perfection. Salt, sea-weed, and

cow-dung are the best manures to use. The roots of this can be easily forced by placing them in a heated pit or dung frame. When a supply is required early in November, the roots should be placed in a temperature of about 65° for about four weeks before it is wanted; but it is a good plan to place a certain number of roots in heat once a fortnight, until it becomes fit to cut from the open borders. Season of forced roots, from November till April; from the open air, from April till June, or later.

French Beans.—This crop requires rich light soil for an early crop, and should be sown on warm borders early in April, and at regular intervals till the end of July in the open air. It is easily forced, and grows well in the winter and spring months in the sharp heat of the Pine stove. It takes from six to seven weeks after sowing in winter and spring to become fit for use, and from five to six when the days become longer, and at these intervals successional sowings should be made. Season for forced plants, October till July. I may just mention that the French Bean transplants well, and I have treated them in this manner, and found them come much earlier than from seed; although the crop may not be so heavy, still earliness is very important.

Broccoli.—This crop should be sown in May, and again in June for the latest planting, as it often survives the winter when the first batch of plants gets destroyed by frosts. In dry soils and moderately good seasons a continuous supply of good heads can be produced from the time Cauliflower ends in November till it comes into season again in June. Deep rich soil, tramped firm before planting, will give good results, while on light, hungry, or gravelly soils they are often worthless on account of clubbing.

Brussels Sprouts.—The seed of this requires to be sown early in spring, either in March or beginning of April; these should be planted out in May, and will be ready for use in September. They should always be planted 3 feet apart each way, for nothing is ever gained by crowding this class of plants. Another sowing should be made in May; from these plants a supply should be obtained till April.

Cabbage.—A typical vegetable in the kitchen garden, and one that cannot be dispensed with. Land for this crop should be heavily manured. For spring use sow the seed the beginning of August, and plant out in September. For summer use sow

in March and plant out as soon as they are fit. There is no difficulty in securing a supply all the year.

Cauliflower.—A favourite summer and autumn vegetable. The seed for spring use should be sown in September, and in October they should be transplanted under walls and on warm borders, not less than 4 inches apart. Some should be planted under handlights, others in cold frames. The greatest enemy they have in winter is damp, so that it is seldom necessary to water them in winter. For a very early supply a few hundreds should always be grown in small pots. In the summer months a small quantity should be sown at regular intervals on north and east borders, and the seedlings thinned out, but not transplanted—merely allowed to come to perfection in seed-beds. Seed may be sown as late as July for coming into use in October and November. Season, June to November.

Celery.—One of the finest vegetables in cultivation, requiring abundance of well-rotted manure, and an abundant supply of water in dry weather, to have it in its best condition. Seed should be sown in February for a supply in August, and again in April for a later supply. The season extends from August to May, or even later by covering the plants up behind a north wall.

Seakale.—This excellent spring vegetable well repays for liberal treatment. It is partial to a dressing of saline matter, and grows best in an open, free, warm soil. Root cuttings make the best plants. If planted out in April, 18 inches apart, they form fine crowns by autumn for forcing. Roots placed in heat take about three weeks to be fit for use. It should always be grown in a perfectly dark house or cellar. Season, November to May.

Spinach.—This is often in much demand, and to secure a constant supply it should be sown frequently during the summer and autumn. For the winter supply the plants should be well thinned out to prevent them damping. It grows well in any ordinary light, rich garden soil. Season, all the year.

Carrots.—A light sandy soil is best for this crop. For an early supply seed should be sown in January, in heated pits or frames. For a winter supply sow the beginning of May, and store in sand for winter use early in October. To have fresh roots for use during the summer months a small sowing should be made every month from March till July, in the open air.

Turnips.—A common vegetable, for which we have no good substitute in culinary art, and of which a continuous supply is always looked for. A little care and management easily secures this. A succession of sowings from March to August, or even later some seasons, will furnish a supply for eight or nine months of the year, the remainder being furnished by carefully stored roots. The “turnip fly” is often very destructive to this crop in the young state. The best remedy I know is to give the young plants a good dusting over with fresh lime immediately they appear above ground.

Rhubarb.—No vegetable we grow pays better for high cultivation than this, although in many gardens it receives a scant allowance of either labour or manure. To have this really good it should be grown in deeply trenched soil, and it can scarcely be too heavily manured. The large massive crowns thus produced are forced with the greatest ease in a Mushroom-house, or other construction of a suitable nature and similar temperature; or it may be forced by placing Seakale-pots over the crowns, and then covering them up with a mass of heated horse-litter and leaves. In most cases it is the best plan to lift the crowns and force them, making a new plantation every year to keep up the supply.

Potatoes.—For the earliest supply of these, pot cultivation is best, as they can be moved into different houses as required. To have new Potatoes in January the sets should be started in an early Peach-house or vinery in September. For a supply in March, start in December. Sand and leaf-soil is best for very early crops. Early crops can also be secured under south walls, and in any warm sheltered part of the garden. For main crops in the garden they should always be allowed ample space between the rows, and this must be decided by the height the variety selected grows.

Mushrooms.—To grow these good, horse-droppings are required, which should be thrown up in a large heap and turned over three or four times to allow the rank heat and steam to pass off before making up the beds. These may be made in the form of ridges in the open air, or in sheds, or in a regular Mushroom-house; but for a constant supply in summer nothing is equal to underground cellars. The main points to secure success are good spawn, the soil used to be free from lime, the material of the

beds neither too wet nor too dry, and an even temperature of from 55° to 60° after the beds commence bearing; never spawn the beds till the thermometer is falling below 85° . When the beds begin to decline bearing, give a watering of warm rain-water in which a little salt is mixed; then cover up with dry hay for a week or ten days.

Parsley.—Sow seed in March, and again in May. Early in August cut over a portion of the beds, and as soon as it has started into growth lift the roots and plant them out in cold frames for a winter supply.

Onions.—For a winter supply sow in March in drills on rich ground, and made firm before sowing. Salt and soot are both excellent manures for this crop. The latter should be sown broadcast over the beds soon after the plants are thinned out. For spring and summer use sow in August; these can also be transplanted in spring for successional supplies. Some wood-ashes sprinkled on the surface of the beds will often prevent the winter frosts from lifting the plants out of the ground.

Tomatoes.—These are now in universal use, hence they should be grown in every garden. They strike freely from cuttings, and if these are inserted in small pots in August, and placed in a hot-bed, they will soon root, and, if planted out in a house kept warm during the winter, they will produce fruit all the winter. These, as a rule, come into bearing much earlier than plants raised from seed. In warm parts of the garden they will ripen in the open air most seasons, but for a constant supply they should be grown under glass for nine months of the year.

Cucumbers.—For a supply of these properly constructed houses are required. A high temperature is needed to produce these in winter—from 65° to 75° . Abundance of rain-water at the roots and on the leaves in summer are needed; in winter good light houses, with plenty of hot-water pipes for heat. Keep the plants healthy and free from insects, and they are sure to bear well. Like most plants, there is nothing like keeping up a fresh supply of young plants, so that they may be ready at any time to take the place of any that may show signs of decay.

Lettuce.—This popular vegetable is more used in salads than as an ordinary dish, and the great demand for nice crisp Lettuce requires constant attention and the very best methods of cultivation to fully meet it. Sown in January on mild hotbeds it

forces well. For summer use regular sowings should be made once a fortnight; during June, July, and August they are always best when grown on north borders. Lettuce, to have them in the best possible condition, require very rich soil and abundance of water at the roots while growing.

This includes what I may term the indispensable vegetables that should be grown for the supply of a family. We will now give a few particulars of what I may term the second division of this subject.

Globe Artichoke.—A favourite dish with some families, while others seldom or never use it. Requires slight protection in winter, and a fresh plantation should be formed every two or three years by planting outside shoots in light rich soil, 3 feet apart each way. Season, June to September.

Jerusalem Artichoke.—Quite a different vegetable, and much more useful than the preceding, as it is in use throughout the winter months. Requires ample space and fresh ground every year to grow it well.

Beans (Runner).—A very prolific and excellent vegetable. Sow in April and June for use in June and July. The roots of this may be stored in sand all the winter and planted out in May.

Broad Beans.—These may be sown in autumn, and again in March for a summer supply. As a rule, these should be grown in the hardest soil in the garden, and after they have formed a number of flowers, the tops may be pinched out to induce them to come into use early.

Cardoon.—This requires to be grown in trenches somewhat like Celery, but, as a rule, it is not in much demand. Season, November to March.

Vegetable Marrows.—When well grown and used in a young state these furnish a very wholesome vegetable, and are in demand with most families. Seed should be sown early in March and the plants grown on in pots. Plant out in May under handlights in a warm sheltered spot. They require rich ground to grow them to perfection. Season, July till October.

Beetroot.—Used in salads. Sow in April, and again in May. Requires fine soil and watching, to prevent birds and slugs from eating the young plants. Season, all the year round.

Endive.—Sometimes used as a vegetable. Sow in June, and

continue to make small sowings till the end of August. It may also be grown like Celery, and blanched in the same manner. Season, August to April or May.

Leeks.—Sow in March, thin out in the seed-bed to 10 inches apart, and leave a crop on the ground, but transplant on to fresh ground for a successional crop. These require rich deep soil to grow them to a large size. Season, October to May.

Parsnips.—Sow in March, 14 inches apart between the rows, and thin out to 12 inches in rows. Requires a deep sandy soil to grow it well. Should always be lifted as wanted. Season, September to May.

Horseradish.—Requires a deep soil. Fresh beds should be formed by planting crowns every two or three years. Season, all the year round.

Radishes.—These are more used as a salad than as a culinary vegetable. They force easily, and for a winter supply they must be grown in frames. For a summer supply sow little and often, and in hot weather on a north border in light soil.

Salsify and Scorzonera.—This may be sown in May in light sandy soil. Season, October to April.

Savoys.—A somewhat coarse but hardy and useful vegetable. Sow in April, and again in May. Plant out to the proper distance apart, which must depend upon the variety grown. Season, October to March.

Egg Plant.—Although much used in cooking in some countries abroad, it has never become popular here, and a small number of plants furnish sufficient for the demands of most establishments. Sow the seed in heat in March, and grow on in pots or plant out in a frame. Season, July to October.

Kohl Rabi.—Sow like Turnips, on well-prepared ground. Season, August to May.

Maize or Indian Corn.—Sow in heat and plant out in trenches like Celery. If sown in April it can be had fit for use in July.

Kale or Borecole.—A very hardy and useful vegetable for furnishing greens through the winter season. Sow in May, and plant out 2 feet apart by 18 inches. Season, October to May.

Mustard and Cress.—Requires to be grown in heat for a winter supply. If it can be placed in a high temperature it can be grown in few days. It should always be sown twice a week.

Sorrel.—A hardy and useful vegetable ; it is easily forced in a gentle heat in winter and spring. Season, all the year round.

Rampion.—The root of this is used in winter and spring for salads. Season, October to March.

Stachys tuberosa.—A new and excellent vegetable where variety is required. Plant out the small roots in spring, 18 inches apart. Lift in autumn when ready. Season, October to March.

Shallots.—A very productive garden crop. Plant out early in March, about 12 inches apart, in good rich sandy soil ; plant firm, and store away as soon as they become ripe. This will often do well, and give a good return when Onions fail or give only a poor return.

Culinary Herbs.—As these form a rather important item in the supplies to be provided from the vegetable garden, we mention them in this division. They should always receive the necessary attention for their proper cultivation, so as to have them in their best condition, and not be, as is so often the case, consigned to obscurity and neglect in some out-of-the-way corner of the garden. Due attention should also be given to collecting, drying, and storing those that are of use in the winter in a dried state. They are best gathered when just coming into flower. They should be carefully dried, but not roasted, in the sun. The culinary or pot herbs that are generally in demand include Basil, Borage, Fennel, Marigold, Marjoram, Mint, Sage, Tarragon, and Thyme, and, in more limited quantities, Angelica, Anise, Balm, Caraway, Dill, Hyssop, Lavender, Pennyroyal, Parslane, Rosemary, Rue, Savory, and many others of lesser note. Mint and Tarragon are easily forced for a supply in the green state from November to May.

We must now pass on to the third and last division of the subject, and shall be obliged to treat the vegetables included in it in the most summary manner.

Capsicum.—These must be grown in heat in pots. The green and ripe pods are used as a condiment, and as an ingredient in pickles, and they are also used in a variety of ways.

Chicory.—A very useful substitute for Lettuce, and may be forced in winter by placing a given number of roots in a Mushroom-house or other dark place. Seed may be sown in rows

in April, and the roots lifted in autumn and stored away till wanted. Season, November to May.

Chervil.—Requires to be sown often during the summer, and in winter protected by a cold frame; or sow in heat like Mustard.

Chives.—These are sometimes in demand, and a supply can be had in winter and early spring by lifting and forcing the roots in a mild hotbed or frame.

Corn-salad.—Sow seed in spring and as often as the demand lasts, but it is usually grown on a very limited scale. Season, January to July.

Dandelion.—Not often in demand, and used the same as Chicory. Good Lettuce or Endive are, however, much better than either. Season, November to May.

Garlic.—More used for flavouring dishes than for any qualities it possesses as a vegetable. Plant out in March the same as Shallots. Season, all the year round.

GENERAL REMARKS.

With a few general remarks we must close this hurried survey of the method of supplying a household with the vegetables in demand all the year round. Taking it for granted that the kitchen garden is of the proper extent and fully equipped with all modern conveniences and necessary appliances, it is the duty of the gardener to regulate the cropping so that there shall be an ample, but not a wasteful, supply of the vegetables in demand at all seasons of the year. The selection of the vegetables to be grown, and the quantities of kind, are matters that must be decided in accordance with the wants of each place; and they require the utmost care and judgment on the part of the gardener. Only the very best of thoroughly proved varieties should be grown to furnish the regular supplies to a family. New and untried varieties should never occupy more than a limited space in any garden, until they are found to be superior to those already cultivated, "or fill a gap," and thus prove to be really worth their room. Every vegetable grown should be of the finest quality, and be supplied to the family in the best possible condition—neither too old to be rank and coarse, nor too young to be insipid and wasteful to use. They should always be selected for use by an experienced person, and,

when properly dressed and cleaned, sent immediately to the kitchen, as the delicate flavour of many quickly deteriorates, and they are never so good as when fresh from the garden.

Mr. SHIRLEY HIBBERD moved a vote of thanks to the contributors to the Exhibition, and to the Committees, as well as to the readers of papers, which was carried unanimously; and, on the motion of Mr. MALCOLM DUNN, seconded by Mr. LAXTON, a hearty vote of thanks was accorded to the Council of the Society for holding the Exhibition and Conference.

VEGETABLE CONFERENCE.

SEPTEMBER 24, 25, AND 26, 1889.

INTRODUCTION TO STATISTICAL DIGEST.

THE Vegetable Conference held in the Society's gardens at Chiswick on the dates above named proved one of the most complete and gratifying successes of the past season. The novelty of the subjects in this case submitted to scientific treatment; the liberality of the contributors, who may be said to have made the Conference European rather than British; and the fine quality and typical character of the main bulk of the contributions, combined to ensure an amount of interest surpassing all ordinary expectation. The Vinery and two large tents were filled with the collections of vegetables, bulbs, tubers, and miscellaneous subjects; and the attendance on the several days of the business included not only an unusual number of the foremost practical cultivators of this country, but many also of the most eminent scientific horticulturists in the world. It is a happy circumstance that the valuable literary work resulting from this meeting is associated with a body of information on the species and varieties of esculent vegetables of the greatest importance. This has been secured to the Society by committees of experts, who gave their time and talent to the technical investigation of the entire Exhibition in its several departments, as represented in the classification.

It should be observed, as a preliminary to the particulars presently to be given, that the date of the show necessarily excluded many important subjects, including all, or nearly all, of the products of cultivation usually classed as "early." If a general characterisation of the several exhibits were needed, probably they might be most conveniently spoken of as "main-crop and late varieties," although in so extensive and various a display the subjects were far-reaching both as to season and use, many of them being as appropriate to the season of spring as to the autumn and winter, which, of course, might claim a considerable proportion. A practical conclusion to be drawn from this fact

will at once occur to the reader, but it may be well to mention it, that this report may be precise and practical.

It will obviously be desirable in a year or two's time to repeat the performance on the same plan, or nearly so, at an earlier time of the year, with a view to bring into notice the best of the first and second supplies from the open ground and from the various sheltering agencies that are employed in the cultivation of early vegetables, salads, and roots. And indeed there may, even then, remain a necessity for the systematic study of the products of the forcing-house conjointly with the latest winter supplies of the produce of the previous year. It will thus be seen that the Vegetable Conference of September last has no finality, but should rather be regarded as the first of a series; and in any case another should follow, to include the produce of the late spring and early summer.

The classification adopted was considered necessary to combine scientific distinctions with the obvious relationships of the several subjects. There must always be looked for in such a business a conflict between technical propriety and the convenience of the parties who are more directly interested. The botanist, the gardener, and the cook, perhaps also the merchant, have their several views; and the problem is how best to harmonise these views with the general usefulness of the entire work. If that cannot be done, then it becomes desirable to avoid the confusion of a diversity of requirements and ensure arrangements the least encumbered with contradictions and paradoxes. It is believed that a safe course has been taken, both as a precedent for further proceedings, and to guide in some measure in the preparation of schedules for provincial exhibitions.

Two important tasks were set before the Committees that were charged with the categorical criticism of the exhibition. They were in all cases to review the names as well as make selections of the best of the several species and varieties. It need not follow that the names adopted are either scientific or absolutely original. In such matters usage is of primary importance. The Committees had to consider public convenience as well as garden and table qualities, and the names finally adopted were, generally speaking, such as may be described as "familiar in men's mouths as household words." To take but one example, the Musselburgh leek has distinct character and

high quality, and will be found amongst the varieties recommended. The name is well known, and equally well known to the experts is the variety that should bear that name. As for the rest there is nothing more to be said, for were the thing utterly unknown in Musselburgh, and its history wholly unconnected therewith, the name would be confirmed because it is established and has acquired distinct significance. The utmost the Committees attempted in respect of names was to rectify labels that were wrong, and to select varieties by name that were in proper character, as the result of careful selection and good cultivation.

In the particulars that follow the greatest care has been taken to embody the work of the Committees in the briefest possible statement of facts. It is not to be understood that the Committees have named all the good things in the several classes. They have not, indeed, attempted any such impossibility. But they have, in many instances, made record of the best; and in all they have specified the most distinct, the most useful, the most correctly named, the most generally attainable, and the most various in style, purpose, and season, of the things that were actually before them.

In conclusion, it may be proper to remark that although within the past twenty-five years great changes have passed over the vegetable garden, to the advantage of all concerned, and more especially the general public, there are certain typical forms of leading esculents that do not change, or that change but slowly, and, consequently, much of the information embodied in the present report has more than temporary interest and value. Changes will indeed take place, and improvements may always be hoped for, but the conclusions established by this Conference will be of value for many years, both as directly indicating the higher ranges of relative merit, and serving as standards of comparison for improvements in the future.

Before recording the results of their work it may perhaps be as well to mention the names of those gentlemen who so kindly acted on the General and Executive Committees and on the Committees of Selection, as their names will of themselves be a testimony to the reliable nature of the work done and the decisions arrived at.

THE GENERAL AND EXECUTIVE COMMITTEES.

Chairman—*Mr. H. J. Veitch, F.L.S., Chelsea.

Vice-Chairman—*Mr. Shirley Hibberd, Priory Road, Kew.

Secretary—*Mr. A. F. Barron, R.H.S. Gardens, Chiswick.

General Committee.

- Alderman, Mr. H., Morden Hall, Morden, Surrey.
 Allan, Mr. W., Gunton Park, Norwich.
 Austen, Mr. J., Witley Court, Stourport.
 Bardney, Mr. W., Norris Green, West Derby, Liverpool.
 *Barr, Mr. P., 12 King Street, Covent Garden.
 *Bates, Mr. W., Poulett Lodge, Twickenham.
 *Beale, Mr. E. J. (Messrs. Carter & Co.), 237 High Holborn.
 Beckett, Mr. T. A., Cole Hatch Farm, Penn, Amersham.
 Benary, Mr. E., seed grower, Erfurt, Germany.
 Bloxham, Mr. G., Great Brickhill Manor, Bletchley.
 Breese, Mr. G., Petworth Park, Petworth.
 Burnett, Mr. J., The Deepdene, Dorking.
 Chettleburgh, Mr. W., Worstead House, Norwich.
 Clayton, Mr. H. J., Grimston Park, Tadcaster.
 Coleman, Mr. W., Eastnor Castle, Ledbury.
 Culverwell, Mr. W., Thorpe Perrow, Bedale.
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 *Dean, Mr. A., Bedford, Hounslow.
 Deverill, Mr. H., Banbury.
 Divers, Mr. W. H., Ketton Hall, Stamford.
 Dunn, Mr. M., Dalkeith, N.B.
 Elphinstone, Mr. W., Shipley Hall, Derby.
 Fidler, Mr. C., Reading.
 Fish, Mr. D. T., Hardwicke House, Bury St. Edmunds.
 Gilbert, Mr. R., Burghley, Stamford.
 Haines, Mr. S., Coleshill, Highworth.
 Hall, Mr. E., Bolton Hall, Bedale.
 *Herbst, Mr. H., Kew Road, Richmond, Surrey.
 *Hudson, Mr. J., Gunnersbury House, Acton.
 Hughes, Mr. J., Eydon Hall, Byfield, Northampton.
 Hunter, Mr. (Messrs. Austin & McAslan, seedsmen), Glasgow.
 Iggulden, Mr. W., Marston, Frome.
 Ker, Mr. W., Dumfries.

- *Ker, Mr. R. Wilson, Liverpool.
 Laing, Mr. J., Forest Hill.
 Lambert, Mr. J., Onslow Hall, Shrewsbury.
 Lye, Mr. J., Market Lavington, Devizes.
 McIndoe, Mr. J., Hutton Hall, Guisborough.
 May, Mr. J., Northaw House, Barnet.
 Mead, Mr. W., Beckett Park, Shrivenham.
 Methven, Mr. J. (T. Methven & Son), Princes Street, Edinburgh.
- *Miles, Mr. G. T., Wycombe Abbey, High Wycombe.
- *Moss, Mr. A. (Messrs. J. Wrench & Sons), King William Street, E.C.
 Muir, Mr. J., Margam Park, Taibach, South Wales.
- *Nutting, Mr. W. J., 106 Southwark Street, S.E.
 Poupart, Mr. W., Twickenham.
 Pragnell, Mr. W. G., Sherborne Castle, Dorset.
 Richards, Mr. G. H., Somerley, Ringwood.
- *Roberts, Mr. J., Gunnersbury Park, Acton.
 Ross, Mr. C., Welford Park, Newbury.
- *Sherwood, Mr. N. N. (Messrs. Hurst & Son), 152 Houndsditch, E.
- *Silverlock, Mr. C. (Messrs. Rulley & Silverlock), Savoy Street, Strand.
- *Smith, Mr. J., Mentmore, Leighton Buzzard.
 Smith, Mr. W. G., Dunstable.
- *Sutton, Mr. A. W., F.L.S., Reading.
 Thomson, Mr. D., Drumlanrig, Thornhill, N.B.
 Vilmorin, Mr. H., Paris.
 Waite, Mr. C. G., Glenhurst, Esher.
 Walker, Mr. J., Whitton.
 Waterman, Mr. A., Preston Hall, Aylesford.
 Watkins, Mr. A. (Messrs. Watkins & Simpson), Exeter Street, Strand.
 Webb, Mr. Edward, Stourbridge.
 Westcott, Mr. R., Raby Castle, Darlington.
 Wiles, Mr. E. S., Edgecote Park, Banbury.
- *Wilks, Rev. W., Shirley Vicarage, Croydon.
 *Willard, Mr. J., Holly Lodge, Highgate.
 *Wright, Mr. J., 171 Fleet Street, E.C.
 *Wythes, Mr. G., Syon House, Brentford.

* These form the Executive Committee.

COMMITTEES OF SELECTION.

Section A.—GREEN VEGETABLES.

- Coleman, Mr. W., The Gardens, Eastnor Castle, Ledbury.
 Hughes, Mr. J., The Gardens, Eydon Hall, Byfield, Northampton.
 Nutting, Mr. W. J., 106 Southwark Street, S.E.
 Vilmorin, Mr. H., 4 Quai de la Megisserie, Paris.

Section B.—FRUITS AND PULSE.

- Barr, Mr. P., 12 King Street, Covent Garden.
 Burnett, Mr. J., The Gardens, Deepdene, Dorking.
 Iggulden, Mr. W., The Gardens, Marston, Frome.
 Ker, Mr. R., The Nurseries, Liverpool.

Section C.—TUBERS AND BULBS. *Sub-section.*—POTATOES.

- Denning, Mr. W., Heathfield Nursery, Hampton.
 McIndoe, Mr. J., Hutton Hall.
 Miles, Mr. C. T., Wycombe.
 Smith, Mr. J., The Gardens, Mentmore, Leighton Buzzard.
 Veitch, Mr. P., The Nursery, Exeter.

Sub-section.—OTHER TUBERS AND BULBS.

- Dunn, Mr. M., The Gardens, Dalkeith Palace.
 Harrison, Mr. J., The Nurseries, Leicester.
 Waite, Mr. C. J., The Gardens, Glenhurst, Esher.
 Willard, Mr. J., The Gardens, Holly Lodge, Highgate.

Section D.—TAP ROOTS.

- Benary, Mr. John, Erfurt, Germany.
 Hill, Mr. E., The Gardens, Tring Park, Herts.
 Moss, Mr. A. (Wrench & Sons), King William Street, E.C.
 Ross, Mr. C., The Gardens, Welford Park, Newbury.
 Silverlock, Mr. C., Savoy Street, Strand.

Sections E and F.—SALADINGS AND MISCELLANEOUS.

- Lye, Mr. J., Market Lavington.
 Molyneux, Mr. E., The Gardens, Swanmore Park, Bishop's
 Waltham.
 Poupart, Mr. W., Twickenham.
 Wildsmith, Mr. W., The Gardens, Heckfield Place, Winchfield.
 Wythes, Mr. G., The Gardens, Syon House, Brentford.

REFEREES.

Chairman—Dr. Hogg, F.L.S.

- Douglas, Mr. J., The Gardens, Great Gearies, Ilford.
 Ingram, Mr. W., The Gardens, Belvoir Castle, Grantham.
 Laxton, Mr. T., Bedford.
 Sharman, Mr. C. H. (Carter's), 237-8 High Holborn.
 Sutton, Mr. A. W., F.L.S. (Sutton & Sons), Reading.

LIST OF EXHIBITORS.

- Buccleuch, His Grace the Duke of, Dalkeith Palace,—gardener,
 Mr. Malcolm Dunn.
 Bunyard & Co., Messrs. G., The Nurseries, Maidstone.
 Burdett-Coutts, Baroness, Holly Lodge, Highgate,—gardener,
 Mr. J. Willard.
 Burnett, Mr. J., The Deepdene Gardens, Dorking.
 Carnarvon, The Earl of, Highclere Castle, Newbury,—gardener,
 Mr. W. Pope.
 Carter & Co., Messrs. James, 237-8 High Holborn.
 Cartwright, Colonel, Eydon Hall, Byfield, Northampton,—gardener,
 Mr. J. Hughes.
 Cartwright, R. A., Esq., Edgcote, Banbury,—gardener, Mr. E.
 S. Wiles.
 Chandos-Pole Gell, H., Esq., Hopton Hall, Derby,—gardener,
 Mr. G. Bolas.
 Chettleburgh, Mr. W., Worstead House, Norwich.
 Clarke, S., Esq., Cairn Castle, Larne, Co. Antrim,—gardener,
 Mr. H. Henderson.
 Clive, Mr. R., Brynderwen, Chepstow.
 Davis, Mr. J., Bodenham, Leominster.
 Dean, Mr. R., Ranelagh Road, Ealing.
 Deverill, Mr. H., Corn Hill, Banbury.
 Dick, W. F. Hume, Esq., Thames Ditton House, Thames Ditton,—
 gardener, Mr. W. Palmer.
 Dobbie & Co., Messrs., The Nurseries, Rothsay, N.B.
 Ellesmere, Earl of, Manor House, Brackley,—gardener, Mr.
 Starke.
 Ensor, Mr. J. L., Semer, Ipswich.

- Exeter, The Marquis of, Burghley House, Stamford,—gardener,
Mr. R. Gilbert.
- Eyre, Lieutenant-Colonel, Welford Park, Newbury,—gardener,
Mr. C. Ross.
- Fletcher, Lady F., Kenward, Yalding, Maidstone,—gardener, Mr.
R. Smith.
- Fuller, Mr. N. F., Idsworth Park, Horndean, Hants.
- Gilbert, Mr. W. G., Sinnowe Hall, Guist, Norfolk.
- Hanan, Mr. H., Seedsman, 16 Bank Street, Edinburgh.
- Harrington, The Earl of, Elvaston Castle, Derby,—gardener, Mr.
J. H. Goodacre.
- Harrison & Sons, Messrs., Seedsmen, Leicester.
- Hart, Mr. C., The Nursery, Beaumont Road, Leyton.
- Hoare, E., Esq., Hackwood Park, Basingstoke,—gardener, Mr.
Bowerman.
- Hopwood, J. T., Esq., Ketton Hall, Stamford,—gardener, Mr. W.
H. Divers.
- Hughes, Mr. J., Heathfield, Bracknell.
- Lockie, Mr. T., Oakley Court, Windsor.
- Lye, Mr. J., Clyffe Hall, Market Lavington, Wilts.
- Lye, Mr. R., Sydmonton Court, Newbury.
- McIndoe, Mr. J., Hutton Hall, Guisboro', Yorks.
- Nelson, E. M., Esq., Hanger Hill House, Ealing,—gardener, Mr.
E. Chadwick.
- Nelson, G. H., Esq., Rousham Park, Oxon,—gardener, Mr. H.
Wingrove.
- Nicholas, Mr. R., Castle Hill, North Devon.
- North, Lord, Wroxton Abbey, Banbury,—gardener, Mr. T.
Doherty.
- Northumberland, The Duke of, Syon House, Brentford,—gar-
dener, Mr. G. Wythes.
- Novelty Seed Company, Newton-le-Willows, Lancashire.
- Oakshott & Millard, Messrs., Seed Merchants, Reading.
- Osman, Mr. C., South Metropolitan District Schools, Sutton,
Surrey.
- Perkins, Mr. J., Thornham Hall, Eye, Suffolk.
- Portal, W. S., Esq., Malshanger Hall, Basingstoke,—gardener,
Mr. N. Kneller.
- Poupart, Mr. W., Twickenham.
- Royal Horticultural Society, Chiswick.

- Rutley & Silverlock, Messrs., Savoy Street, Strand.
Scott, Mr. John, The Nurseries, Merriott, Somerset.
Sharpe & Co., Messrs., Seed Merchants, Sleaford, Lincoln.
Shaw-Lefevre, Hon. E. L., Heckfield Place, Winchfield,—gardener, Mr. W. Wildsmith.
Smith, Mr. J., Mentmore, Leighton Buzzard.
Sneyd, R., Esq., Keele Hall, Newcastle, Staffs.,—gardener, Mr. J. Wallis.
Southby, P., Esq., Bampton, Oxford,—gardener, Mr. G. Neal.
Stuart & Mein, Messrs., Seed Merchants, Kelso.
Talbot, C. R. M., Esq., M.P., Margam Abbey, Taibach, S. Wales,—gardener, Mr. J. Muir.
Talbot, Hon. Colonel W. P. Glenhurst, Glenhurst, Esher,—gardener, Mr. C. J. Waite.
Taylor, Mr. F., Swindon Hall, Cheltenham.
Veitch & Sons, Messrs. James, Royal Exotic Nursery, Chelsea.
Veitch & Son, Messrs. R., The Nurseries, Exeter.
Vilmorin, Andrieux & Co., 4 Quai de la Megisserie, Paris.
Waterhouse, A., Esq., Yattendon Court, Newbury,—gardener, Mr. R. Maher.
Webb & Sons, Messrs., Seed Merchants, Stourbridge.
Willis, Mr. J., Bishopsteignton, Teignmouth.
Wingfield, Colonel, Onslow Hall, Shrewsbury,—gardener, Mr. R. Maher.

STATISTICAL NOTES ON THE VEGETABLES EXHIBITED.

*Compiled from the Reports of the several Committees by
Mr. A. F. BARRON.*

A.—GREEN VEGETABLES.

I.—CABBAGES, INCLUDING COLEWORTS.

16 Exhibitors.

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) NONPAREIL SECTION. **Type**:—*Ellam's Early, Old Nonpareil.*

Heads medium size, conical. Early.

Early Heartwell Marrow, Ellam's Early, Denbies' All Heart, Denning's Early, Improved Nonpareil, Nonpareil, Oxheart Early, Paris Market, Veitch's Matchless, Wheeler's Imperial.

(b) ENFIELD MARKET SECTION. **Type**:—*Hative d'Etampes* (first early); *Offenham* (second early). Heads large, broad.

Good for main crop.

Early Rainham, Etampes (very early), Express Extra-early, Enfield Market, Harrison's Victoria, Offenham, Reading Defiance, Sutton's Imperial, Stuart & Mein's No. 1, Vanack.

(c) DRUMHEAD (or other large sort).

Christmas Drumhead, Drumhead, Early Flat White, Winnigstadt.

(d) SMALL TYPE OF COLEWORT.

Early Rennes, Hardy Green Colewort, Early York, Little Pixie, Miniature Drumhead (St. John's Day), St. John's Day, Rosette Colewort.

(e) VARIETIES NOT CLASSED.

Chou de Burghley, Couve Tronchuda, Green Glazed.

Certificates of Merit awarded to—

Ellam's Early (first early), from Mr. J. Willard.

Old Nonpareil (second early), from Messrs. Carter & Co.

Hative d'Etampes, from Messieurs Vilmorin & Cie.

Offenham, from Messrs. Harrison & Sons.

Rosette Colewort, from Messrs. J. Veitch & Sons.

Hardy Green Colewort, from Messrs. J. Veitch & Sons and Mr. W. Poupart.

Chou de Burghley, from Mr. R. Gilbert.

REMARKS.

For a really high-quality Cabbage for autumn use, there is hardly one equal to St. John's Day, which, although generally classed amongst the Drumhead section, from its shape, is of a very different and distinct character. It is broad, flat, with scarcely any stem, the head resting on the ground. The leaves are very brittle, consequently unsuitable for rough market use; should be sown in the spring. Winnigstadt is another autumn Cabbage, not so well known as its merits deserve. It is tall, conical, forming large, very firm hearts; very useful in dry, hot seasons. Couve Tronchuda should be noted as an entirely distinct variety, valued by many for its fleshy midribs, which are eaten like Seakale. This variety requires high cultivation. Gilbert's Chou de Burghley is of unique description, forming large heads, enveloping a small Broccoli, thus partaking of both characters. The old Early York deserves mention as a fine useful autumn sort. Ellam's Early, a very excellent variety for spring use, is not so well adapted for autumn. The two Coleworts—Rosette and Hardy Green—deserve special notice as two of the most useful vegetables for winter, being extremely hardy, forming small hearts of very fine quality. These Coleworts are not fully appreciated in private gardens, although grown for the London market to a very great extent. The Drumhead section, which are not adapted for garden culture, were not well represented.

II.—RED CABBAGE.

12 *Exhibitors.*

VARIETIES EXHIBITED.

Blood Red, Large Blood Red, Large Red Drumhead, Sutton's Dwarf Red, Sutton's Blood Red, Red Dutch.

SELECTIONS.

- (a) Red Dutch. (b) Large Red Drumhead.

Certificates of Merit awarded to—

- Red Dutch, from Messrs. Dobbie & Co., Rothesay.
 Large Red Drumhead as a market variety.
 Red Dutch, from Mr. Gilbert, Burghley.

REMARKS.

But little variety was observable amongst those exhibited. The Blood Red varieties were noted as rather smaller, and the Red Dutch exhibited by Messrs. Dobbie as being especially fine.

III.—SAVOYS.

14 *Exhibitors*.

CLASSIFICATION OF VARIETIES EXHIBITED.

- (a) EARLY ULM. Heads small, compact, pale green.
 Early Ulm, Early Dwarf Ulm, Early Vienna, Gilbert's Universal, Very Early Paris.
- (b) GREEN CURLED. Heads medium size, deep green.
 Dwarf Green-curved, Edinburgh Market, Victoria Green-curved.
- (c) DRUMHEAD. Heads large, flat; late.
 Drumhead, Vertus.
- (d) GOLDEN. Heads medium size, yellow.
 Golden Globe, Yellow.

Certificates of Merit awarded to—

- Early Ulm, from Messrs. J. Veitch & Sons.
 Dwarf Green-curved, from J. Veitch & Sons and W. G. Gilbert.
 Vertus, from Messrs. J. Veitch & Sons.

REMARKS.

The examples of Early Ulm, which is the best early type, were not particularly good, being too large, and approaching in character the Green-curved. Gilbert's Universal may be noted as a medium-sized variety of the Ulm type; and Victoria, a finely curled selection of the Dwarf Green-curved. The Yellow

and Golden varieties are very hardy, and of fine quality, but do not find favour on account of the colour. Vertus is a fine variety of Drumhead.

IV.—CAULIFLOWER OR BROCCOLI.

12 Exhibitors.

VARIETIES EXHIBITED.

Autumn Giant (Veitch's), Michaelmas White (Sutton's), Pearl, Walcheren, Veitch's Self-protecting.

Certificates of Merit awarded to—

Veitch's Autumn Giant, from Mr. J. Lambert.

Pearl, from Messrs. J. Veitch & Sons.

REMARKS.

Veitch's Autumn Giant is by far the best and most generally useful autumn Cauliflower in cultivation. The heads are large, and of fine quality. It is an immense improvement on the Walcheren, which up to a few years ago was the leading sort. A variety now rarely to be met with, but unsurpassed for quality, is the Purple Cape.

V.—BORECOLES OR KALE.

7 Exhibitors.

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) CURLED BORECOLE. Leaves much curled.

Chelsea Exquisite Culzean Castle, Curled Borecole, Dobbie's Selected, Dwarf German, Dwarf Green-curved, Extra Dwarf Curled, Late Curled, Tall Green-curved, Read's Hearting Borecole, Veitch's Dwarf Late Curled, Scotch Curled.

(b) BUDA KALE. Leaves plain, dark green.

Asparagus Kale, Buda Kale, Chou de Milan.

(c) COTTAGER'S KALE.

Cottager's Kale, Ragged Jack, Welsh.

Certificates of Merit awarded to—

Extra Dwarf Green-curved, from Messrs. J. Veitch & Sons.

German Kale, Dwarf Scotch, from Mr. J. Hanan.

Dobbie's Selected Scotch Kale, from Messrs. Dobbie & Co.

Cottager's Kale, from Messrs. J. Veitch & Sons.

REMARKS.

Of the Scotch Kales, those exhibited by Mr. Hanan and Messrs. Dobbie & Co. were very finely curled; but, on that account, were not considered so hardy. Cottager's Kale, where a good stock is secured, is one of the hardiest and most useful of winter greens. Buda and Asparagus Kales are very useful in severe winters, withstanding any amount of frost, and are of fine quality.

VI.—BRUSSELS SPROUTS.

8 Exhibitors.

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) SMALL FORM. **Type**:—*Paris Market*. Sprouts small, compact.

Dwarf Imported, Half-dwarf Paris Market, Veitch's Selected, Dobbie's Improved, President Carnot.

(b) LARGE FORM. **Type**:—*Wroxton*. Sprouts large, and somewhat loose.

Exhibition, Dalkeith, Aigburth, Large Imported, Paragon, Reading Exhibition, Sutton's Exhibition, Veitch's Exhibition, The Wroxton.

Certificates of Merit awarded to—

Paris Market, from Messrs. J. Veitch & Sons.

Large Wroxton, from Mr. H. Deverill.

REMARKS.

The Brussels Sprouts were mostly exhibited as plants, and were scarcely in condition, the date being rather too early for them. There is not much variety to be found beyond size, and the present fashion, it may be noted, is in favour of the large forms, which are often coarse and inferior in flavour to the smaller.

VII.—GLOBE ARTICHOKEs.

8 Exhibitors.

VARIETIES EXHIBITED.

Green Globe, Purple Globe.

Certificate of Merit awarded to—

Green Globe, from Mr. J. Lambert.

VIII.—SPINACH.

5 *Exhibitors.*

VARIETIES EXHIBITED.

Viroflay or New Prolific, New Zealand, Prickly-seeded or Winter, Round-seeded.

SELECTIONS.

For summer use, Viroflay; for winter use, Prickly-seeded.

Certificates of Merit awarded to—

Viroflay, from Mr. R. Smith.

Prickly, from Mr. W. Poupert.

REMARKS.

The Viroflay is remarkable for its very large fleshy leaves. The Prickly is generally grown for winter use, under the idea that it is more hardy than the Round-seeded; but this is not the case. One of the best winter Spinaches is the Round-seeded Flanders. The New Zealand Spinach (*Tetragona expansa*) is quite a distinct plant—a low, trailing, very free-growing annual, producing an abundance of leaves, which in dry seasons form an excellent substitute for Spinach.

B.—FRUITS AND PULSE.

I.—VEGETABLE MARROWS AND GOURDS.

15 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

A. *Marrows.* For use in summer in a green or growing state.

I. LARGE FORM.

1. *Trailing.*

(a) WHITE OR YELLOW. **Type:**—*Common Vegetable Marrow.*

Long Cream, Long White Trailing Marrow, Long Pale Yellow, Long Smooth White, Cucozille of Tripoli, Long White, Long White Ribbed Marrow, Large White Marrow, Long White Vegetable Marrow, Sutton's Long Cream Vegetable Marrow, Sutton's Vegetable Marrow, Long White Squash, Vegetable Marrow Squash.

(b) GREEN OR COLOURED.

Gooseberry Green, Italian Green-striped, Long Green, Long Green Ribbed, Long Smooth Mottled, Large Green Marrow, Prince Albert Marrow, Sutton's Improved Green-striped.

2. *Bush.**(a)* WHITE OR YELLOW.

Bush or Cluster Marrow, Long White Bush Marrow Gourd, Sutton's Improved White Bush, Long White Bush Squash.

(b) GREEN OR COLOURED.

Green Bush or Cluster Marrow.

II. SMALL FORM.

Yellow, Small, Ovate.

Anglo-Indian, Brazilian Sugar Marrow, Cork Oak-skinned, Cucurbita pixedalis, Squash Warted Marrow, Hibberd's No. 1, Moore's Vegetable Cream, Pen-y-Byd.

III. CUSTARD SQUASH.

Yellow.

Custard Marrow (yellow), Custard Marrow (white), Custard sp. American, Early Gold Bush, Golden Yellow Bush, Custard Marrow, Improved Custard Marrow, Sutton's Custard Vegetable Marrow.

B. *Gourds or Pumpkins.* For use in a ripe state during the winter season.

I. SMALL FORMS.

Bonnet du Turc (scarlet), Canada Crookneck, Elector's Cap, Geneva Bush, Marron or Chestnut, Mission, Ohio or Autumnal Marrow, Olive, Prolific (very early), Rouge de Crimée, Slate-coloured, Turban, Small China Turban, Yokohama.

II. LARGE FORMS.

Etampes Mammoth (scarlet), Large Green Pumpkin, Large Tours Pumpkin (streaked green), Large Yellow Mammoth Potiron, Patagonian Long Green, Valparaiso.

Certificates of Merit awarded to—

A. Anglo-Indian, from Mr. E. Chadwick.

Long White, from Mr. W. Palmer.

Moore's Cream, from Messrs. R. Veitch & Son.
 Hibberd's No. 1, from Royal Horticultural Society.
 Long White Bush, from Messrs. Vilmorin & Co.
 Pen-y-Byd, from Mr. J. Muir.

- B. Gourd—Large Yellow Mammoth, from Royal Horticultural Society.
 Pumpkin—Rouge de Crimée, from Royal Horticultural Society.
 Squash—Yokohama, from Messrs. Vilmorin & Co.

REMARKS.

In the first section, Marrows which are used in a young and tender condition, the typical representative is the old white Vegetable Marrow. Many variations of this exist, more or less distinct in form, size, colour, or productiveness. The larger forms find favour in market gardens, and the smaller—such as Hibberd's Marrow and Pen-y-Byd—in private establishments. These smaller forms are, moreover, of finer quality. The Custard Squashes are quite distinct in form, and very ornamental. Marrows should be used in a much younger state than they generally are; indeed, in their young state almost every one of the Gourds and Pumpkins may be used, and are so used in many parts. Of Gourds and Pumpkins intended for winter use in making soup, &c., varieties with thick flesh are most suitable. The large yellow Mammoth is a typical form, being large and fleshy. Some of the smaller forms are, however, more useful, one of the best being Yokohama, which is very solid and good.

II.—CUCUMBERS.

A. Grown under Glass.

7 *Exhibitors.*

VARIETIES EXHIBITED.

Carter's Model, Excel All, I Beat All, Lockie's Perfection, Purley Park Hero, Rollisson's Telegraph.

Certificate of Merit awarded to—

Lockie's Perfection, from Mr. T. Lockie.

B. RIDGE CUCUMBERS, grown in the open ground.

4 *Exhibitors.*

REMARKS.

The exhibits in this class presented no features worthy of note.

III.—TOMATOES.

24 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) FRUITS, LARGE, ROUND, RED, SMOOTH. **Type:**—*Perfection.*

Apple-shaped Rose, Chemin, Conference, Cardinal, Early Rose, Gilbert's Surpasse, Hathaway's Excelsior, Hackwood Park, Ham-Green Favourite, The Hovey, Lorillard, Livingstone's Perfection, The Scarlet Mikado, Mayflower, Northern Beauty, New Early, Perfection, President Cleveland, Paragon, Sutton's Maincrop, Sandwich Islands, Sutton's Perfection, Yorkshire Beauty, Waite's Seedling, Webb's Sensation.

(b) FRUITS, LARGE, RED, CORRUGATED. **Type:**—*Early Red.*

Abundance, Conqueror, Early Red, Early Large Red Smooth, Earliest of All, First Little Beauty, Hepper's Goliath, Large Red, Laxton's Open Air, Old Red, Orangefield, Trophy.

(c) SMALLER FRUITED. **Types:**—*Chiswick Red and Horsford's Prelude.*

Advancer, Chiswick Red, Eclipse, Fizzicaria, Horsford's Prelude, King Humbert, Little Gem, Ne Plus Ultra, Peach, Tennis Ball, Wiles's Prolific.

(d) FRUITS, LARGE, CRIMSON OR FLESH-COLOURED. **Type:**—*Acme.*

Acme, Dedham Model Red, Dedham Favourite, Dwarf Champion, Livingstone's Favourite, Mikado (rose), Moore's Gem, Pomegranate, Vick's Criterion.

(e) FRUITS, YELLOW. **Type:**—*Green Gage.*

Blenheim Orange, Golden Queen, Golden Nugget, Green Gage, Prince of Orange, Yellow King, Yellow Plum, Yellow Perfection.

(f) FRUITS, SMALL, ORNAMENTAL. **Types:**—*Pear-shaped and Red Currant.*

Cherry-shaped, Currant-fruited, Nisbet's Victoria, Pear-shaped, Red Cherry.

Certificates of Merit awarded to—

Chemin Rouge, from Messrs. Vilmorin & Co.

Mikado Red, from Messrs. Vilmorin & Co.

Advancer, from Royal Horticultural Society.

Golden Queen, from Royal Horticultural Society and Messrs.
J. Veitch & Sons.

Conference, from Royal Horticultural Society.

Tennis Ball, from Royal Horticultural Society.

Ham-Green Favourite, from Royal Horticultural Society,
Messrs. J. Veitch & Sons, and Mr. R. Dean.

Perfection, from Mr. W. Poupart and Mr. R. Dean.

REMARKS.

Tomatoes were well represented, and made a very satisfactory display. Most of the larger and finer examples were referrible to the Perfection type—which for size, form, and colour seems to be very near perfection. Chemin, from Messrs. Vilmorin, may be noted as apparently the same as that variety. The one originated, however, in France, the other in America, about the same time. The Scarlet Mikado, of Vilmorin, a sport from the original Mikado, is a large and promising variety. The Conference Tomato (Chiswick Hybrid) is a variety which originated in the Society's Gardens, from Horsford's Prelude \times Perfection; is remarkably free-fruited, of medium size, and well adapted for culture in the open ground. The crimson or flesh-coloured varieties, of which Acme is the type, do not find so much favour as the scarlet.

IV.—BEANS.

A. RUNNERS.

16 *Exhibitors*.

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) SCARLET SECTION. Seeds variously coloured.

Carter's Champion, Carter's Jubilee, Champion, Chelsea Giant, Chelsea White, The Czar, Girtford Giant, Ne Plus Ultra, Old Scarlet, Painted Lady, Reading Giant, Scarlet, Sutton's Scarlet Runner, Scarlet Champion, Veitch's Mammoth Scarlet, Veitch's Giant White, White Jubilee, White Runner.

(b) BUTTER BEANS.

Hungarian Butter, Early Golden Cluster, Fillbasket, Mont d'Or Butter, Sutton's Butter.

(c) PRINCESS.

B. DWARF KIDNEY BEANS.

6 *Exhibitors.*

VARIETIES EXHIBITED.

Canadian Wonder, Fulmer's Forcing, Mohawk, Ne Plus Ultra, Negro Longpod, Osborn's Forcing, Sion House, Sir J. Paxton.

Certificates of Merit awarded to—

A. Neal's Ne Plus Ultra, from Mr. G. Neal and Mr. H. Deverill.

Jubilee, from Mr. H. Deverill and Mr. C. J. Waite,

Early Golden Cluster, from Messrs. J. Veitch & Sons.

Fillbasket, from Messrs. J. Veitch & Sons.

Sutton's Butter, from Mr. R. Gilbert.

B. Canadian Wonder, from Mr. G. Wythes.

Mohawk, from Mr. G. Wythes.

REMARKS.

The number of names to so-called varieties of Scarlet Runners (eighteen) is very surprising where so little variety really exists; the chief real difference having relation to the colour of the seed—the White-seeded being equal in quality to the Scarlet. Size of pod being an important qualification, many "Giants" have been introduced of recent years; some of these are, however, extremely coarse, and not prolific. One of the best selections is Ne Plus Ultra. The Butter Beans have not found much favour in this country, chiefly on account of their colour. They are of very superior quality, however, and should be largely grown. Amongst the Dwarf Kidney Beans the Canadian Wonder—an old variety—is still one of the best.

Dried Haricots were well represented from Mr. J. Perkins, Thornham Hall, Eye, Suffolk.

V.—PEAS.

13 *Exhibitors.*

VARIETIES EXHIBITED.

Autocrat, British Queen, Champion of England, Charles the

First, Criterion, Duchess of Edinburgh, Duke of Albany, Earliest Blue, Fortyfold, Harrison's Glory, Huntsman, Ne Plus Ultra, Prodigy, Reading Giant, Stratagem, Sutton's Latest of All, Sutton's Matchless Marrowfat, Sutton's Satisfaction, Telephone, Veitch's Goldfinder, Veitch's Perfection.

Certificates of Merit awarded to—

Duke of Albany, from Mr. J. Lambert.

Telephone, from Mr. J. Lambert.

Prodigy, from Mr. J. Lambert.

Sutton's Matchless, from Mr. J. Lambert.

Ne Plus Ultra, from Mr. J. H. Goodacre.

Carter's Stratagem, from Mr. J. H. Goodacre.

REMARKS.

For so late a period in the season the display of Peas was remarkably good. Ne Plus Ultra, it may be noted, still stands forward as one of the very best. Sutton's Matchless Marrowfat, a comparatively new variety, seemed very promising. The collections exhibited by Messrs. Goodacre and Lambert were especially fresh and fine.

VI.—CAPSICUMS OR CHILLIES.

3 *Exhibitors.*

VARIETIES EXHIBITED.

Cayenne, Celestial Pepper, Long Red, Golden King, Large Bell, Improved Bull's Nose, Sweet Spanish Mammoth.

Certificates of Merit awarded to—

Golden Queen, from M. Vilmorin.

Large Bell, from M. Vilmorin.

REMARKS.

The varieties exhibited by M. Vilmorin were very large, and remarkably beautiful.

C.—TUBERS AND BULBS.

I.—POTATOES.

18 *Exhibitors.*

VARIETIES EXHIBITED.

Ashleaf (Veitch's), Ashleaf (Myatt's), Adirondack, Abundance (Sutton's), Alpha, Arizona, Beauty of Hebron, Best of All, The Blacksmith, The Bruce, Breese's Prolific, Blue Fluke, Bouncer, Beauty of Edgcote, Basford Beauty, Bedfont Purple, Blue Beard, Blue Eyes, Buffalo Bill, Bliss's Triumph, Benefactor, Chancellor, The Colonel, The Cobbler, Cetewayo, Clipper, Chiswick Favourite, Crown Jewel, The Cambridgeshire, The Canon, Councillor, Chieftain, Conference, Cardinal, Coles' Favourite, Day's Sunrise, Dean's London Hero, Delight, The Dean, The Daniels, Diamond, Debutante, Davenport's Thoroughbred, Duke of Albany, Discovery, Early American Kidney, Early Rose, Earliest of All, Early White Kidney (Sutton's), Early Market (Sutton's), Early White (Sutton's), Edgcote Purple, Edgcote Early, Early Coldstream, Early Vermont, Epicure's Delight, Early Puritan, Early White Hebron, Early Victor, Early Regent, Ellington's Prolific, Early Champion, Epicure, Fidler's Prolific, Fidler's Success, Favourite, Flounder, Fortyfold, Fidler's Reading Giant, Farish's Seedling, Friesland Beauty, General Gordon, Governor, Hughes' Purple Perfection, Hughes' Pink Perfection, Harrison's Short Top, Hebron Surprise, Holyhoke, Imperator, Improved Ashleaf, Isis, Ideal, Isla, King of the Russets, King of Crimson, King Philip, Kinver Hill, Kinver Monarch, Liliputian, Lady Truscott, Lord Tennyson, Late Rose, Laxton's Utility, Lavington Conqueror, Magnum Bonum, Mottled Beauty, Mr. Breese, Maggie, Manhattan, Myatt's Prolific, Masterpiece (Sutton's), Matchless (Sutton's), Magistrate, Murray's Seedling, Marketman, Market Favourite, Milltown' Blue, Miss Fowler, Negro, Nonesuch (Sutton's), Osborne's Pride, Prizetaker, Prolific, Pink Perfection, Purple Perfection, Perfection (Fidler's), Prince of Wales, Perfect Peach Blow, Prime Minister, President Garfield, Perkins' Snowdrop, Progress, Probationer, Plymouth Rock, Queen of the Valley, Reading Hero, Reading Giant, Reading Russet, Reading Ruby, The Rector, Red Vassan, Ross's M.P., Redskin Flourball, Radcliffe Kidney, Red Perfection, Renown, Ramona, Rural New Yorker, Red King,

Schoolmaster, Snowdrop, Sutton's Seedling, Satisfaction, Snowflake, Snow Queen, Suffolk Favourite, Stourbridge Glory, Sharpe's Victor, Stirling Beauty, Sharpe's Standard, Sterling, Seaconnet, Surprise, True Ashleaf, Trophy, Thauborn, Tacoma, Universal, Vicar of Laleham, Vitellotte, Vermont Beauty, Vermont Champion, Victory, Village Blacksmith, Vegetarian, Webb's White Beauty, White Elephant, Wiltshire Giant, Wachuset, Winnebago, Wordsley Queen, Wordsley Pride.

EIGHTEEN VARIETIES
FOR GARDEN CULTURE FOR AUTUMN OR WINTER SUPPLY
SELECTED BY THE COMMITTEE.

Abundance. Round white, great cropper.
 Adirondack. Round pale pink, bright eye.
 Beauty of Hebron. Long white, tinged pink.
 Chancellor. Long white.
 Early Puritan. Long white.
 Epicure's Delight. Long white.
 King of the Russets. Round red, rough skin.
 London Hero.
 Magnum Bonum. Long white, great cropper.
 Reading Giant.
 Reading Russet. Round red, russetty.
 Schoolmaster. Round white, rough skin.
 Snowdrop. Half-long white—very even.
 Sutton's Satisfaction.
 Sutton's Seedling. Round white, fine quality.
 Veitch's Ashleaf. Long white kidney, early.
 Vicar of Laleham. Round blue or purple, large.
 Webb's Renown. Round white.

SIX SELECTED VARIETIES
FOR SMALL GARDEN CULTURE.

Beauty of Hebron. Long even white, tinged pink; great cropper; early.
 Early Puritan. Long white, even.
 Reading Russet. Round red.
 Sutton's Seedling. Round white.
 Veitch's Ashleaf. Long white kidney.
 Vicar of Laleham. Round purple.

SIX SELECTED VARIETIES
FOR MARKET AND FIELD CULTURE FOR AUTUMN
AND WINTER SUPPLY.

Beauty of Hebron.	Reading Giant.
Chancellor. Long white.	Sutton's Satisfaction.
Magnum Bonum.	Vicar of Laleham.

Certificates of Merit awarded to—

- Adirondack, from Messrs. R. Veitch & Son.
 Beauty of Hebron, from Mr. J. Lye.
 Chancellor, from Mr. J. Lambert.
 Coles' Favourite, from Mr. J. Lambert.
 Early Puritan, from Messrs. R. Veitch & Son.
 Edgcote Beauty, from Mr. E. S. Wiles.
 Edgcote Purple, from Mr. E. S. Wiles.
 Favourite, from Mr. E. S. Wiles.
 Hughes' Perfection, from Mr. J. Hughes.
 Hughes' Pink Perfection, from Mr. J. Hughes.
 King of the Russets, from Mr. J. Lye and Messrs. J. Carter
& Co.
 London Hero, from Messrs. R. Veitch & Son and Mr. E. S.
Wiles.
 Prime Minister, from Mr. J. Lambert.
 Prolific, from Mr. E. S. Wiles.
 Reading Giant, from Mr. J. Lye, Mr. J. Hughes, and Mr. E.
S. Wiles.
 Reading Russet, from Mr. W. Wildsmith and Mr. J. Hughes.
 Renown, from Mr. E. Webb and Mr. J. Lambert.
 Reading Ruby, from Mr. J. Hughes and Mr. E. S. Wiles.
 Sutton's Seedling, from Messrs. G. Bunyard & Co. and Mr.
J. Lambert.
 Snowdrop, from Mr. E. S. Wiles.
 Sutton's Abundance, from Mr. W. Wildsmith, Mr. J. Lambert,
and Mr. J. Hughes.
 Sutton's Magnum Bonum, from Mr. E. S. Wiles.
 The Dean, from Mr. J. Lye.
 The Rector, from Mr. E. S. Wiles.
 Veitch's Improved Ashleaf, from Mr. J. Hughes.
 Vicar of Laleham, from Messrs. R. Veitch & Son.
 Wordsley Prize, from Messrs. C. Webb & Sons.

IA.—NEW VARIETIES OF POTATOES.

9 *Exhibitors.*

Mr. R. Clive :—Two Seedlings, unnamed.

Mr. R. Dean :—Blue Eyes, Conference, Cornish Standard, Fair Devonian, Governor.

Mr. J. Hughes :—Duke of Fife, Duchess of Fife, Ruby King.

Mr. T. Laxton :—Victorious.

Mr. J. Lye :—Victory.

Mr. R. Maher :—The Amateur, The Cottager, The Gentleman, The Vegetarian.

Mr. C. Ross :—Confidence, Probation, Talisman.

Messrs. Sharpe & Co. :—Frieston Seedling, Poor Man's Friend.

Mr. Wiles :—Edgcote Early.

Certificates of Merit awarded to—

Conference (flat-round, white), from Mr. R. Dean.

Cottager, The, from Mr. R. Maher.

Duchess of Fife (second early white kidney), from Mr. J. Hughes.

Edgcote Early (white kidney), from Mr. E. S. Wiles.

The Gentleman, from Mr. R. Maher.

Talisman (red-flaked kidney), from Mr. C. Ross.

Victorious (long white kidney), from Mr. T. Laxton.

Victory (long white, smooth), from Mr. J. Lye.

REMARKS.

Potatoes were well represented; the examples in most of the classes being remarkable for their clearness and evenness of form, evidences of high and careful cultivation. Specially prominent throughout most of the collections may be noted the varieties Abundance, Satisfaction, Sutton's Seedling, &c., sent out by Messrs. Sutton. Hughes's Pink Perfection may also be mentioned as exceedingly pretty. The beauty of form now attained amongst Potatoes is very conspicuous, and must be recognised. Potatoes as shown on the Exhibition table are, however, to some extent misleading, appearance being the chief and, of a necessity, almost the only point governing the selection; the quality of the variety and its cropping properties not being in evidence, are apt to be overlooked, and judgment formed from

appearance only. Bliss's American varieties as shown were somewhat coarse and rough.

II.—ARTICHOKES, JERUSALEM.

4 *Exhibitors.*

REMARKS.

There is only one variety recognised. Jerusalem Artichokes require careful selection of the tubers for planting, and liberal treatment as regards cultivation—fresh, good soil. Considerable room exists for the improvement of this tuber.

III.—LEEKS.

13 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) THE MUSSELBURGH TYPE.

Holborn Model, Musselburgh, Renton's Hybrid, The Oxonian.

(b) THE LYON TYPE.

Dobbie's Champion, Ayton Castle, Henry's Prize, Prizetaker, Renton's Monarch, The Lyon.

Certificates of Merit awarded to—

Musselburgh, from Mr. J. Lambert.

The Oxonian, from Mr. J. C. Waite.

The Lyon, from Messrs. Stuart & Mein, and Mr. J. Lambert.

Dobbie's Champion, from Messrs. Dobbie & Co.

Renton's Monarch, from Messrs. R. Veitch & Son.

REMARKS.

The first section, of which the Musselburgh is the typical example, has the foliage dark green, more upright in growth, and altogether sturdier and of a more hardy nature than the others. The second section, of which The Lyon is the typical example, is generally of a pale green colour of foliage, somewhat flabby and drooping, of free growth, generally attaining a large size; but it is somewhat tender, and apt to perish in severe winters. The examples exhibited by Messrs. Stuart & Mein, Messrs. Dobbie, and others, were remarkably fine.

IV.—ONIONS.

26 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) **FLAT.** **Type:**—*Anglo-Spanish.* Colour, yellow to brown.

Rousham Park Hero, Sutton's Improved Reading, Anglo-Spanish, Brown Spanish, Globe Danvers, White Spanish, Anglo White Spanish, Sandy Prize, Banbury, Market Favourite, Veitch's Maincrop, Nuneham Park, Strasburg, Deptford, Sulphur Yellow, Yellow Vertus, Danvers, Danvers Yellow, Giant Zittau.

(b) **GLOBE OR ROUND.** **Type:**—*Ailsa Craig.* Colour, yellow to brown.

Wroxton Improved, Ailsa Craig, Cranston's Excelsior, New Paramatta, Bedfordshire Champion, Brown Globe, Cocoa Nut, Trebon's White Globe, Golden Ball, Southport Yellow, James's Keeping, Pinesfield, Improved Pinesfield.

(c) **TRIPOLI.** Divided into two sub-sections: 1. Flat Tripoli.
2. Round or Globe Tripoli.*Sub-section 1.* **FLAT.** **Type:**—*Flat Madeira or Tripoli.*

Giant Lemon Rocca, Giant Rocca, Large Giant Rocca, St. Laurent, Giant Late White Flat Tripoli, Large Flat Madeira or Tripoli, Large Blood-red Flat Italian, Red Italian, Yellow Rocca.

Sub-section 2. **ROUND OR GLOBE.** **Type:**—*Giant Madeira or Globe.*

Advancer, Madeira, Golden Globe, Red Italian, Large Round Madeira or Globe.

(d) **WHITE OR SILVER SKIN.** Divided into two sub-sections:
1. Large. 2. Small or Pickling.*Sub-section 1.* **LARGE SILVER SKIN.**

American or Southport White Globe, White Lisbon, Selected White.

Sub-section 2. **SMALL SILVER-SKINNED.** **Type:**—*The Queen.*

Early White Naples, The Queen, Silver-skinned, Silver-skinned Pear-shaped, Carter's Silver Ball.

(e) BLOOD-RED. Divided into two sub-sections :

1. Flat. 2. Round or Globe.

Sub-section 1. FLAT.

Black Douglas, Dobbie's Red, Blood-red, Red Champion.

Sub-section 2. ROUND.

Southport Red Globe.

(f) NOT CLASSED.

Como, Welsh.

Certificates of Merit awarded to—

Advancer, from Mr. H. Deverill.

Ailsa Craig, from Mr. H. Deverill, Mr. W. Pope, Mr. W. G. Gilbert, Mr. J. Hughes, and Mr. R. Kneller.

Anglo-Spanish, from Messrs. Oakshott & Millard, Mr. W. Pope, and Mr. Wingrove.

Bedfordshire Champion, from Mr. G. Wythes.

Black Douglas, from Mr. H. Deverill and Mr. D. Murray.

Blood-red, from Messrs. Dobbie & Co.

Brown Globe, from Messrs. J. Veitch & Sons.

Brown Spanish, from Messrs. J. Veitch & Sons.

Cocoa-nut, from Mr. H. Deverill.

Deverill's Improved Wroxton, from Mr. W. Pope.

Flat Yellow or Brown Anglo-Spanish, from Mr. H. Deverill.

Giant Late White Flat Tripoli, from Vilmorin-Andrieux et Cie.

Giant Madeira, from Vilmorin-Andrieux et Cie.

Giant Zittau, from Messrs. R. Veitch & Son.

James's Keeping, from Mr. Muir, Mr. H. Deverill, and R.H.S.

Large Blood-red Flat Italian, from Vilmorin-Andrieux et Cie.

Maincrop, from Mr. Nicholas.

Pinesfield, from Mr. H. Deverill.

Queen, from Messrs. J. Veitch & Sons.

Reading, from Mr. J. Hughes.

Rousham Park Hero, from Mr. W. Pope, Mr. C. J. Waite, Mr. Bowerman, and Mr. H. Deverill.

Southport Red Globe, from Messrs. J. Veitch & Sons and R.H.S.

BEST KEEPING ONIONS.

- | | |
|---------------------------|-------------------------------------|
| (a) FLAT SECTION. | (b) GLOBE SECTION. Yellow to brown. |
| 1. Deptford or Strasburg. | 1. Brown Globe. |
| 2. Maincrop. | 2. James's Keeping. |
| 3. Rousham Park. | 3. Bedfordshire Champion. |
| 4. Giant Zittau. | 4. Wroxton. |
| 5. Anglo-Spanish. | 5. Advancer. |
| (c) TRIPOLI SECTION. | (d) BLOOD-RED SECTION. |
| 1. Red Italian. | 1. Blood-red. |
| | 2. Southport Globe. |

SEASONS OF ONIONS.

1. Tripoli section—June to September.
2. White-skinned—September to December.
3. Flat, yellow to brown—December to March.
4. Globe, yellow to brown—March to June.

These sections arrive at maturity in the order given, and will furnish a supply of sound Onions all the year round.

REMARKS.

The Onions formed one of the most remarkable features of the Conference, and attracted much attention. Those exhibited by Messrs. Vilmorin, from Paris, proved specially attractive, from the great size of some of the examples of the Tripoli varieties and their delicate colouring, to a degree never attained in this country. The English Onions exhibited by Mr. Deverill and others were equally remarkable, both for size and handsome appearance. Rousham Park and Anglo White Spanish may be specially noted as very extraordinary developments of the well-known White Spanish Onion, which have been partly secured by most careful selection for many years, and partly by excellent cultivation. Banbury would seem to be a district of the country with soil specially suited for the growth of Onions.

Messrs. Deverill sent the following note on cultivation with their exhibits:—

“ Soil: strong, heavy, dark loam, double dug in autumn, and plenty of good, fat, rotten farmyard manure worked in, top-dressed with soot in November, the beds being pointed over in March, and made firm previous to planting.

“Seeds sown in cold frames February 1, and transplanted into the beds April 22.

“During the summer the beds are mulched with spent mushroom-bed manure, and in showery weather a liberal dose of Deverill’s Onion Fertiliser, and Thomson’s Vine and Plant Manure, sown broadcast. Sulphur and a small quantity of slaked lime, mixed, is sown overhead early in the morning, to check any signs of mildew.”

V.—SHALLOTS.

5 *Exhibitors.*

Certificate of Merit awarded to—

Large Red, from Messrs. Stuart & Mein, Kelso.

REMARKS.

There are only two true varieties of Shallots grown. The common old sort, small, and of a pale colour, is the favourite variety for culinary purposes. The larger red is more showy.

VI.—GARLIC.

1 *Exhibitor.*

Certificate of Merit awarded to—

Garlic, from Mr. R. Smith.

REMARK.

A very fine sample.

VII.—GARDEN TURNIPS.

19 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) WHITE FLESHED

Early Red American Stone.

Early Snowball (White Stone section).

Early Strapleaf.

Extra Early Milan.

Green-top Stone.

Jersey Lily (Snowball section).

New Exhibition (White Stone section).

Model White Stone.

New Marble (Green-top Stone section).

Red Stone.

Snowball Perfection.

Sutton's Early Six Weeks (Snowball section).

Veitch's Red Globe.

White Dutch.

White Egg.

The White-fleshed Turnips may, for convenience, be divided thus :

- i. Early, of which the type is Early Milan.
- ii. Second early ,, ,, White Stone or Snowball.
- iii. Mid-season ,, ,, Green-top Stone.
- iv. Late ,, ,, Round Red Globe.

(b) YELLOW FLESHED.

Carter's Golden Ball (Golden Ball section).

Golden Ball.

Orange Jelly.

Petrowski (Yellow Finland section).

The Yellow-fleshed Turnips may, for convenience, be divided thus :—

- i. Globe, of which the type is Golden Ball.
- ii. Flat ,, ,, Yellow Finland.

Certificates of Merit awarded in—

(a) WHITE-FLESHED SECTION.

1. Early Flat White Sub-section, to Early Milan, from Messrs. J. Veitch & Sons.

2. Round White Sub-section, to Model White Stone, from Messrs. Dobbie & Co. White Stone, from Messrs. J. Veitch & Sons and Mr. Lambert.

3. Round Green-top Sub-section, to Early Marble, from Messrs. Harrison & Sons. Green-top Stone, from Mr. Maher.

4. Round Red-top Sub-section, to Red Globe, from Messrs. J. Veitch & Sons and Messrs. R. Veitch & Son.

(b) YELLOW-FLESHED SECTION.

To Golden Ball, from Messrs. Dobbie & Co., and Mr. J. L. Ensor.

REMARKS.

The Globe section are the best for winter use, as they keep better. The Flat section are the earliest, such as the Milan, Strapleaf, &c. Yellow-fleshed Turnips are hardier than the white-fleshed varieties, and are, on that account, well suited for cultivation in cold and late districts. In Scotland they are generally preferred.

VIII.—KOHL RABI.

3 *Exhibitors.*

VARIETIES EXHIBITED.

Early White Vienna, Green Vienna, Large Green, Purple Vienna.

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) Green-top. (b) Purple-top.

Certificates of Merit awarded to—

Early Vienna, from Messrs. Veitch & Sons, and Messrs. Carter & Co.

Purple Vienna, from Messrs. Veitch & Sons, and Mr. C. Osman.

D.—TAP ROOTS.

I.—BEET.

27 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) RED OR CRIMSON FLESH. **Types**:—(1) *Cheltenham Green Top.* (2) *Nutting's Dark Red.*

Blood-red, Cheltenham Green-top, Chelsea, Covent Garden Red, Covent Garden Perfection, Culverwell's Perfection, Dell's Crimson, Dewar's Beet, Drummond's Monarch, Edinburgh Blood-red, Frisby's Excelsior, Improved Blood-red, Improved Dwarf Deep Blood-red, Jersey No. 1, Macgregor's Favourite, Middleton Park Favourite, Nutting's Dark Red, Omega, Osborn's Select Red, Pragnell's Exhibition, Sutton's Excelsior, Veitch's Improved Black Leaf, Veitch's Dwarf Red.

(b) BLACK OR DARK FLESH. **Type** :—*Pine Apple*.

Dark Red Pyriform Strasburg, Dell's Dwarf Black, Dickson's Superb Black, Dobbie's New Purple, Improved Dark Red, Pine Apple, Queen of the Blacks, Superb Black Beet, Veitch's Selected Dark, Whyte's Extra Dark Red.

(c) TURNIP-ROOTED. **Type** :—*Egyptian Turnip-rooted*.

Bassano, Carter's Crimson Ball, New Early Round, Eclipse, Egyptian, Egyptian Turnip-rooted, Turnip-rooted.

(d) ORNAMENTAL.

Dracæna-leaved.

Certificates of Merit awarded to—

Edinburgh Blood-red, from Mr. Hugh Hanan.

Dewar's Dwarf Red, from Messrs. J. Veitch & Sons.

Eclipse, from Messrs. J. Veitch & Sons.

Dobbie's New Purple, from Messrs. Dobbie & Co.

Dracæna-leaved, from Messrs. Vilmorin et Cie.

Cheltenham Green-top, from Messrs. Harrison & Sons,
Mr. W. Poupert, Mr. F. Taylor, and Mr. G. Wythes.

Middleton Hall Favourite, from Mr. H. Deverill.

Turnip-rooted, from Messrs. Carter & Co.

REMARKS.

Beets were extensively shown, and mostly of good quality. The red or crimson-fleshed varieties are generally preferred to the dark sorts, which have usually more of an earthy taste, and are of a dull appearance when cooked. Although a bright crimson colour may be desirable, it does not at all times determine the quality. Some varieties which are very pale are sometimes of fine quality. The Cheltenham Green-top may be noted as a very excellent sort, of fine uniform size, and of good colour, the leaves almost green. The Dracæna-leaved is a very pretty leaved variety, quite ornamental, but too small for use. The Turnip-rooted Beets are valuable on account of their earliness, and for growing in shallow soils; by judicious sowing they may be had in use all the summer, and they are also of fine quality, although pale in colour. The Egyptian Turnip-rooted is the finest. Bassano is too large.

II.—CARROTS.

21 Exhibitors.

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) SHORT HORN. **Types** :—*French Horn, Guérande.*

Carrotte rouge très courte, Champion Scarlet Horn, Early French Horn, Early Gem (Guérande section), Early Dutch Horn, Early Scarlet Horn, French Forcing, Guérande, Parisian Forcing, Reading Scarlet Horn, Scarlet Model (Guérande section).

(b) INTERMEDIATE. **Types** :—*James's Intermediate, Nantes, Stump-rooted.*

Carrotte de James, Carrotte de Chantenay, Early Market (Nantes section), Early Scarlet Nantes, Half-long Scarlet Nantes, James's Scarlet, Scarlet Intermediate, Scarlet Red Intermediate, Select Stump-rooted, Summer Favourite.

(c) LONG. **Types** :—*St. Valery, Altringham.*

Altringham, Carter's Improved Green-top, Improved Altringham, Long Red Surrey, Matchless Scarlet (St. Valery section), New Red Intermediate, New Scarlet (St. Valery section), St. Valery, Scarlet Perfection (St. Valery section), Veitch's Matchless (St. Valery section), Select Intermediate (St. Valery section).

Certificates of Merit awarded to—

New Scarlet Improved, from the Novelty Company.

Early Very Short French Horn, from Messrs. Vilmorin.

Guérande, from Messrs. Vilmorin et Cie.

Long Red St. Valery, from Messrs. Vilmorin et Cie.

Sutton's Gem (Guérande section), from Mr. J. Lambert.

Sutton's Early Gem (Guérande section), from Mr. J. Lye.

Red Intermediate, from Mr. J. Lye.

Long Red Surrey, from Messrs. J. Veitch & Sons.

Scarlet Perfection (St. Valery section), from Mr. W. Chettleburgh.

REMARKS.

The Carrots were remarkably fine. Special mention must be made of the collection of six varieties exhibited by Messrs. Vilmorin, viz. :—

(1) Carrotte rouge très courte ; (2) Guérande ; (3) Half-long

Scarlet Nantes; (4) Chantenay; (5) James's Intermediate; (6) Long Red St. Valery, which very fairly represented the whole of the varieties existing.

For general cultivation the following varieties are sufficient :— (1) For forcing or frames, Rouge très courte; (2) for summer, Guérande, and the Scarlet Nantes; and (3) for winter, Long Red St. Valery. The Altringham is frequently too long. It is easily known from raising itself out of the ground several inches, which portion, becoming coloured, is useless.

III.—PARSNIPS.

14 *Exhibitors.*

VARIETIES EXHIBITED.

Dobbie's Selected, Dobbie's Selected Hollow Crown, Hollow Crown, Improved Hollow Crown, Student, Turnip-rooted.

Certificates of Merit awarded to—

Dobbie's Selected Hollow Crown, from Messrs. Dobbie & Co.
Improved Hollow Crown, from Messrs. J. Veitch & Sons.
Hollow Crown, from Mr. W. Poupart.

REMARKS.

The examples shown by Messrs. Dobbie were remarkably fine, large, and clear-skinned. But little distinction is apparent between one variety and another, excepting the Turnip-rooted, and this is not appreciated.

IV.—HORSE-RADISH.

2 *Exhibitors.*

REMARKS.

Very large and fine examples from Mr. Poupart.

V.—STACHYS TUBERIFERA.

4 *Exhibitors.*

REMARKS.

This new vegetable seems to be meeting with increased approval, both for cooking purposes and also for use in winter salads.

VI.—SALSAFY.

10 *Exhibitors.*

Certificate of Merit awarded to—
Salsafy, from Mr. R. Smith.

VII.—SCORZONERA.

5 *Exhibitors.*

Certificate of Merit awarded to—
Scorzonera, from Mr. J. Willard.

E.—SALADINGS.

I.—ENDIVE.

6 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

(a) CURLED ENDIVE.

Courte Cloche, Curled, Green-curved, Green-curved Summer, Imperial Curled, Moss-curved, Parisienne d'Été, Piepus, Ruffec (green-curved), Stag's Horn, The Garland, White-curved.

(b) BATAVIAN.

Broad-leaved Batavian, Improved Round Batavian.

Certificates of Merit awarded to—

(a) Ruffec (green-curved), from Messrs. Vilmorin et Cie.

Green-curved, from Messrs. J. Veitch & Sons.

Moss-curved, from Messrs. J. Veitch & Sons.

Parisienne d'Été, from Messrs. Vilmorin et Cie.

(b) Improved Round-leaved Batavian, from Messrs. J. Veitch & Sons.

Broad-leaved Batavian, from Messrs. Vilmorin et Cie.

REMARKS.

Amongst Endive, the fine-curved varieties are the most appreciated. They are, however, the most tender. Of the Batavian there is only one variety worthy of cultivation, viz., the Round-leaved Batavian, which forms close, well-blanchéd hearts almost naturally. This variety is termed by the French "Scarole en Cornet."

II.—LETTUCES.

1 *Exhibitor.*

VARIETIES EXHIBITED.

A couper, Parisienne, Albano, Blonde Berlin, Blonde de Versailles, Brown Marseilles, Balloon, Brown Dutch, Blonde à couper, Californian Curled, Early Ohio, Early Paris Market, Frisée d'Amérique, Frisée à couper Beauregard, Frisée à couper, Grand Admiral, Hammersmith, Lorthoïis, Marvel, Neapolitan, Paris White, Royal Albert, Stanstead Park, Sutton's Queen, Winter Passion, White Passion, White Bavarian.

CLASSIFICATION OF VARIETIES EXHIBITED.

- (a) COS LETTUCE. (1) White, *Balloon*. (2) Coloured,
 (b) CABBAGE LETTUCE. (1) Green. (2) Coloured.

Certificates of Merit awarded to—

Lorthoïis, from Messrs. J. Veitch & Sons.

Blonde Berlin, from Messrs. J. Veitch & Sons.

Albano, from Messrs. J. Veitch & Sons.

Brown Dutch, from Messrs. J. Veitch & Sons.

Frisée à couper Beauregard, from Messrs. J. Veitch & Sons.

REMARKS.

Winter Lettuce.—Best type, Winter Passion. Lettuces for cutting for small Salads.—Best variety, Frisée à couper Beauregard. The exhibits in the Cos section were not very satisfactory, it being too late in the season for this class.

III.—CELERY.

19 *Exhibitors.*

CLASSIFICATION OF VARIETIES EXHIBITED.

- (a) WHITE.

Dwarf White, Dobbie's Invincible White, Luckhurst's Giant White, Matchless White, New Yellow White Plume, Sandringham White, White Gem, White Plume, Wright's Giant White.

- (b) RED.

Aylesbury Prize Red, Covent Garden Red, Divers' Man of Kent, Dobbie's Select Red, Harrison's Early Rose, Leicester Red,

Major Clarke's Red, Pale Red, Red, Standard Bearer, Winchester Pink.

Certificates of Merit awarded to—

Wright's Giant White, from Messrs. Oakshott & Millard.

Dobbie's Invincible, from Messrs. Dobbie & Co.

Sandringham White, from Messrs. J. Veitch & Sons.

Sutton's White Gem, from Mr. J. Lye.

Aylesbury Prize Red, from Mr. H. Deverill.

Standard Bearer, from Mr. F. Taylor.

Covent Garden Red, from Mr. W. Poupart.

REMARKS.

Celery, although shown in considerable quantity, presented nothing of special interest. The varieties certificated were all of excellent character, solid and good. The White Plume may be noted as distinct, the leaves being considerably variegated, thus giving it an appearance of being much blanched. In point of quality it is inferior to the Dwarf White or Sandringham. White Celeries are, as a rule, inferior to the red varieties. A Dwarf Red Celery of the same character as the Dwarf White, which almost blanches naturally without earthing up, would be a great acquisition.

IV.—CELERIAC.

2 *Exhibitors.*

VARIETIES EXHIBITED.

Early Erfurt, Large Smooth Prague, Apple-shaped.

Certificate of Merit awarded to—

Large Smooth Prague, from Messrs. Vilmorin & Cie.

V.—SMALL SALADINGS.

1 *Exhibitor.*

(a) CRESS :—American, Curled, Plain, and Broad-leaved.

(b) WHITE MUSTARD.

(c) LARGE-ROOTED CHICORY :—Witloef.

(d) CHICORY :—French large-leaved.

(e) DANDELION :—Improved, very early Dandelion.

(f) RADISH :—Black Spanish, China Rose.

Certificate of Merit awarded to—

Witloef Chicory, from Messrs. J. Veitch & Sons.

VI.—RADISHES.

1 *Exhibitor.*

VARIETIES EXHIBITED.

Early Deep Scarlet Olive-shaped, Early Scarlet Turnip, Early White Small Turnip, Grey Round, Half-long Deep Scarlet, Long Scarlet, Long White Vienna, Purple Olive-shaped White-tipped Scarlet Olive-shaped, Scarlet Olive-shaped, White-tipped Scarlet Turnip, Early Scarlet Forcing, White Hospital, Large White Summer Turnip, White Olive-shaped, White Turnip, Yellow Summer Turnip.

Certificates of Merit awarded to—

Long Scarlet, from Messrs. Vilmorin & Cie.

Early Scarlet Forcing, from Messrs. Vilmorin & Cie.

Early White Forcing, from Messrs. Vilmorin & Cie.

REMARKS.

These were all nice clear examples of the respective varieties. They do not, however, find much favour in this country in the autumn season.

F.—MISCELLANEOUS.

I.—CARDOONS.

3 *Exhibitors.*

REMARKS.

The exhibits were all of the common smooth variety, well-grown. Cardoons are not much grown or appreciated in this country. They require a great amount of attention in regard to blanching. Although used in a very different manner, Cardoons belong to the same family as the Artichoke.

II.—LEAF BEETS.

3 *Exhibitors.*

Types:—(a) *Chilian* or *Brazilian*, *Seakale*, *Silver*.

(b) *Green*, or *Spinach*.

REMARKS.

Of these Leaf Beets (*a*) the Chilian is a very ornamental plant, producing broad fleshy leaf stalks, similar to Seakale, and which are used in the same manner. The varieties vary in colour, from silver and golden to the most glowing scarlet. (*b*) The Green, or Spinach Beet is quite a different plant, producing a quantity of green leaves in the early spring, which are used as Spinach. It is extremely hardy, and is therefore often valuable on that account.

III.—PARSLEY.

8 *Exhibitors*.

VARIETIES EXHIBITED.

Beauty of the Parterre, Carter's Champion, Curled, Dobbie's Selected, Fern-leaved, Hamburg, Improved Curled, Mote Park, Moss-curled, Moss-green, Myatt's Curled, Plain, Treble-curled, Veitch's Curled.

Certificates of Merit awarded to—

Myatt's Curled, from Mr. R. Dean.

Dobbie's Selected, from Messrs. Dobbie & Co.

IV.—FLAVOURING HERBS.

1 *Exhibitor*.

VARIETIES EXHIBITED.

Anise, Balm, Burnet, Bush Basil, Borage, Camomile, Chives, Fennel, Golden Purslane, Green Purslane, Horehound, Hyssop, Ice Plant, Lavender, Lemon Thyme, Mint, Pennyroyal, Peppermint, Pot Marjoram, Rosemary, Rue, Sage, Sorrel, Southernwood, Sweet Basil, Sweet Marjoram, Summer Savory, Tansy, Tarrygon, Thyme, Water Cress, Wormwood, Winter Savory.

REMARKS.

A most complete and interesting collection, from Messrs. J. Veitch & Sons.

V.—NEW VEGETABLES.

(*a*) ASPARAGUS CHICORY.

Exhibited by R.H.S., Messrs. J. Veitch & Sons, and Mr. J. Willard.

REMARKS.

This new vegetable resembles the common Chicory. The young tender flowering leaf-stalks are cooked like Asparagus.

(b) HUTTON HALL SPROUTS.

Exhibited by Mr. McIndoe.

REMARKS.

This is a variety of Brussels Sprouts recommended for its superior flavour. It produces very large sprouts on the stem, with a small Cabbage on the top. The Committee was of opinion that it required further selection.

(c) KALES.

Exhibited by Mr. H. Henderson, who sent the following interesting note:—

“In common with most gardeners who have to keep up an unbroken supply of vegetables, I have often felt, after a severe winter, the want of a Cabbage and Savoy that would be able to withstand the frosts and snows of winter, and sudden thaws, which are far more damaging to vegetables than frost.

“Borecole stands pre-eminent in this respect, besides being the last to run to seed. This fact led me to think that we might obtain both Savoys and Cabbages equally hardy and late, and probably a better hearting Kale, by crossing them. This idea was carried into effect at the earliest opportunity, making the Borecole the seed-bearing parent.

“I was rather surprised to find the progeny of these crosses showing more of the character of the pollen-parents (Cabbage and Savoy) than of the seed-bearing parent, only 10 per cent. or so taking after the Kale. The latter, shown in the basket, will give a fair idea of how they will heart by November.—HUGH HENDERSON, gardener to Stewart Clark, Esq., Cairn Castle, Larne, co. Antrim, Ireland.”

REMARKS.

Some of the examples very much resembled Gilbert's Chou de Burghley, and others plain-leaved Savoys. They seemed very promising, but require further selection.

(d) THE MELON PEAR (*Solanum guatemalense*).

Exhibited by Mr. N. T. Fuller and R.H.S.

Fruits ovate, from 3 to 4 inches long; skin pale orange, with

a few streaks of purple ; flesh, soft yellow, partaking somewhat of the flavour of the Cucumber and green Tomato. Not considered particularly palatable.

(c) MAIZE, OR SWEET CORN.

Exhibited by Messrs. Vilmorin & Cie.

REMARKS.

Very fine examples of Early Minnesota, Eight Round, and Stowell's Evergreen.

(f) BULBOUS LEEKS.

Exhibited by Mr. G. Bolas, and accompanied by the following note :—

“The Leeks are planted out in May by dibbling them in a foot deep, not pressing any soil round them. All flowering stems are kept cut out that put up in the autumn.

“In the following June the bulbs are formed. As the summer advances they lose their tender properties, and become hard, eventually throwing up flower stems.

“It is a very delicate vegetable when cooked in good stock, and is much appreciated by those who are fond of that excellent vegetable, the Leek.—GEORGE BOLAS, HOPTON HALL GARDENS, WINKSWORTH.”

NOTES.

The following notes, relating chiefly to the cultivation of vegetables, have been kindly sent in by the respective writers, and may prove of use and interest to some.

I.

None of the vegetables sent have been specially cultivated for exhibition. Our soil is very poor, and contains a large quantity of small limestones, and is therefore very unsuitable for vegetable culture. We always work it with the spade as deeply as possible, and give plenty of manure for all crops—such as Celery, Peas, Onions, Leeks, &c. Root crops, such as Carrots, Beet, Parsnips, &c., are grown without any special application of manure, but are sown so as to follow a crop that has been heavily manured, such as Celery for instance ; the ground is also deeply dug and well pulverised for these crops.

Broccoli are planted on firm ground, without manure; the ground is often so hard that holes for planting have to be made with an iron bar; we thus get a firmer growth, which is better qualified to stand the severe frost.

Manure from the cowyard is solely relied upon, as it has a more beneficial effect on this soil than mineral manures; but if we required to manure Potatoes or other root crops, mineral manures would be used, because, if judiciously mixed and applied, they encourage root growth more than the farmyard manure.—
W. H. DIVERS, Ketton Hall, Stamford.

II.

The vegetable gardens here, extending to about eleven acres for crops, divided into breaks averaging an eighth of an acre by lines of fruit trees and bushes, are situated three miles south of the Firth of Forth, at an altitude of 160 to 200 feet, with a south-by-east exposure, and well sheltered. The natural soil is a light sandy loam, not rich, about 1 foot deep, but it has been increased in the gardens to a depth of about $2\frac{1}{2}$ feet, resting on an open gravelly subsoil. With abundance of manure (well-made farmyard manure is best) and high cultivation, it produces excellent crops, of fine quality, of most kinds of vegetables, especially those partial to a light warm soil and a sheltered situation.

The supply of vegetables for the family during winter, spring, and summer is the chief object, and every useful kind of vegetable is grown in the open, in cold frames, or forced, to meet the demands of a large establishment during these seasons. Autumn vegetables are not in demand with us, and consequently the varieties sent to the Conference are more illustrative of the other seasons. The *set* of Cauliflower (Walcheren and Veitch's Autumn Giant) and Broccoli (Snow's Winter White, Veitch's Spring White, Dilcock's Bride, Wilcove Improved, and Veitch's Model) are those which supply us with a constant succession (in the order they are named) of first-rate "heads" all the year round. Walcheren Cauliflower is sown in the open in the middle of August, picked out in cold frames for protection in winter, planted out as early as safe in spring, and comes into use before the middle of June. Successional sowings in spring (the first under glass) keep up the supply; and the same with Autumn Giant, but all in the open air. Broccoli, several sowings in the open air

of "Snows" and "Models" lengthen their season, but have no perceptible effect on the length of season of the other varieties of Broccoli grown. All Broccoli, and other vegetable plants, are "pricked out," and afterwards planted out in the breaks for crop. Broccoli are laid over, with heads to north and stems covered with earth, in November, and are seldom injured in our severest winters, heads of "Snows" being regularly cut from under a covering of snow. As a rule, the ground is not manured for a crop of Broccoli, as rich manure is liable to give it a strong flavour, and cause a rank growth much more susceptible to frost than when grown in unmanured soil.

The Brussels Sprouts exhibited are the well-known "Dalkeith" variety, which is largely grown in the district, and suits admirably. It is of a sturdy habit of growth, thickly set with firm, medium-sized sprouts; does not soon run to seed, and stands our severest winters uninjured. It delights in plenty of manure and high cultivation.

The Vanack Cabbage exhibited is the most useful garden Cabbage we have, and furnishes a supply of excellent little Cabbages all the year round. Sown in July, it usually forms nice heads in the end of January and onwards, if the season is not too severe to prevent all growth. It is one of the hardiest of Cabbages, and very prolific in giving a second crop of nice heads, which are special favourites with French cooks. Its flavour and quality are of the finest.

The Leeks—Musselburgh, Ayton Castle, and The Lyon—are the favourite strains with market gardeners, private gardeners, and exhibitors. Musselburgh is the hardiest, and preferred by most people for the main crop. It is largely grown in the district for market. Ayton Castle is a large, paler coloured, and softer variety, a favourite in gardens as producing fine large early Leeks of rather milder flavour than the Musselburgh, although that is not always considered an improvement by connoisseurs of Leek soup.

The Potatoes exhibited comprise several popular new varieties raised in Scotland: The Bruce, The Maggie, and The Cobbler. All are very productive in rich garden soil, which, however, spoils the quality of all but the earliest varieties of Potatoes. Ashleaf Kidney (Veitch's) and Sutton's Early Regent are first-class, both crop and quality, in the same soil.

The *Stachys tuberifera* has not had a long trial, but it promises fairly well, and produces a numerous crop of small tubers, which make a nice dish for the table. It should be grown in well-loosened soil, as the roots run to some distance from the plant, and bear the tubers at the points.

Generally speaking, carefully chosen kinds and properly calculated quantities of vegetable seeds, combined with high cultivation and a well-regulated succession of crops, will furnish a full supply of the best vegetables in season at all periods of the year.—MALCOLM DUNN, The Palace Gardens, Dalkeith, N.B.

III.

There has been no special method of cultivation in the production of the Potatoes sent further than that the ground was well worked by being forked several times during winter and early spring. No manure was used, the ground having been well manured for the previous crop. They were planted on April 17-18. The soil is light and shallow, resting on a bed of rock.—J. HUGHES, gardener to Colonel Cartwright, Eydon Hall, Northamptonshire.

IV.

The two varieties of Ridge Cucumber, Laxton's Open Air and Laxton's Excelsior, were sown in drills on the level, on strong cold land at Bedford, the former on the 16th and the latter on the 15th May, and have been grown entirely without any protection whatever.

The fruits of Laxton's Open-air Tomato are from plants put out in May last, between early Potatoes, and have been ripened entirely in the open.

The Sandy Prize Onions exhibited are from seed sown broadcast at Bedford on January 18, and have had no artificial treatment.—THOMAS LAXTON, Bedford.

V.

Our land is a sandy loam. For Potatoes I give the soil a liberal coating of farmyard manure in November, and dig it in a half-spit deep, and let the ground lie all the winter in a rough state, and the first week in March fork it over to get the soil as fine as possible. I generally plant in the end of March in drills

about 28 inches from row to row, and 20 inches from set to set, giving a moderate dressing of fish manure. I then cover the sets with a hoe, leaving a ridge over them. This method shields the sets from the frost, and keeps them in a healthy state. I make about three earthings after the Potato grows, leaving the ridges when finished about 15 inches high. By this system I find hardly any sets fail to grow, and there is very little disease.

Celery is sown the last week in February or the first in March. When large enough to handle it is pricked off into boxes, and towards the middle of May it is planted in trenches about 4 inches deep. I like to dig my trench a month before planting, so as to get the soil mellow. I give it about three earthings, the first one being but a very slight one.

Carrots: The soil is dug early in autumn a spit and a half deep, and manured at the same time with good well-decomposed farm-yard manure. The land is forked over again in March to make it as fine as possible, and the seed sown about the third week in April in rows 15 to 18 inches from row to row, according to variety.

Beet is treated about the same as Carrots.—JAMES LYE, The Gardens, Clyffe Hall, Market Lavington, Wilts.

VI.

The Tomatoes sent were all grown out of doors, some on a south wall, but the bulk of them in the open, in shallow trenches. No stimulant whatever has been used, with the exception of a small quantity of old mushroom-bed soil, used at planting-time.

The Peas were sown on June 18, which I have found to be a safe date on which to sow late Peas in the counties of Berkshire and Kent for latest crop. I always use Marrowfats of the British Queen and Ne Plus Ultra type. I have sent a small dish, as a curiosity, of Sutton's Earliest Blue, sown on July 25; but such late sowing is not advisable. Ne Plus Ultra and British Queen here grow 8 and 9 feet high; the manure principally used for them is the product of dry-earth closets.

The Seedling Potatoes are the result of a cross between Covent Garden Perfection and Reading Russet.—ROBERT MAHER, The Gardens, Yattendon Court, near Newbury, Berks.

VII.

Tomatoes are grown here on open walls, and kept to one stem, all the fruits being kept well exposed to light and air all through the growing season. Farmyard manure is applied under the roots before planting. After the first set of bloom, the plants are heavily mulched with good farmyard manure. This season only two waterings have been given. The variety shown is Hathaway's Excelsior.

Celery is grown in the ordinary way in trenches, a quantity of farmyard manure being used in the trenches and some mixed with the subsoil. The plants are in a single row, and are kept well supplied with water when the weather is dry. Celery maggot has this season been very prevalent. Early Celery is bleached with brown paper, which is put on like bandages, and tied securely.

Onions: Rousham Park Hero is the best Onion here in all respects, giving good useful-sized bulbs, with quite ordinary cultivation.

Carrots: Sutton's New Intermediate proves the best for the main crop. It is of large size, and of good colour and flavour.

Beetroot: I find Pragnell's Exhibition is the best and most useful. The roots are of good colour and size, and of excellent flavour.

Cabbage: St. John's Day we find the best for autumn use; it has such good flavour for a cabbage, and is such a nice size for table.—ROBERT SMITH, The Gardens, Kenward, Yalding, Maidstone, Kent.

VIII.

The soil is a heavy yellow loam from 18 inches to 2 feet in depth, and can only be worked at certain times. The subsoil is red rock. The aspect is very low and damp, catching both early and late frosts.

In cultivating Potatoes we have the ground well dug in the autumn and let it lie until it is well dried, and then, on a fine day, fork it over, and repeat this process as many times as convenient. When planting time comes we never dibble the tubers in, but nick the soil out with a spade, then lay the tubers in the proper distance from set to set. This is then forked over until the width you want to plant the next row is reached, then the spade again, &c., &c.—E. S. WILES, The Gardens, Edgcote, Banbury.

IX.

We always let our Potatoes follow a crop of Peas, Onions, or winter Greens. For these crops we give a heavy dressing of stable manure, with soot, in the growing season. In spring the ground is worked twice over, with a good dressing of lime and fine charcoal. The drills then drawn out 2 feet 6 inches apart, and the Potatoes planted 18 inches apart in the line.

To Shallots we give a heavy dressing of soot and a little lime (Onions the same) in the growing season. Ours is a strong loam on the shillet rock.—JOSEPH WILLIS, Hollowmead Lodge, Bishopsteignton, Teignmouth, Devon.

CHRYSANTHEMUM CONFERENCE.

CHISWICK.

NOVEMBER 5TH AND 6TH.

President—Mr. T. B. HAYWOOD, F.R.H.S.

THE President, who was suffering from a severe cold and sore throat, requested the Secretary, the Rev. W. Wilks, to be kind enough to read the Opening Address in his stead.

OPENING ADDRESS.

So great is the inconsistency of human nature—and, whatever tender-hearted young ladies may say of us regarding our barbaric treatment of slugs and snails, of mealy-bug and scale and aphid, we gardeners after all *are* human—so great is the inconsistency of human nature, that if I give you what is called an “Opening Address,” you will probably be muttering inwardly, “Bother the old fellow! I wish he’d let us get on to something interesting and practical”; and if I do not give such an opening, some of you will be saying, “Well, I think he might have given us an address.” I shall therefore endeavour, if possible, to hit off the happy medium, and say a few words to you, but they shall be but few.

We have met together to-day to celebrate the Centenary of the introduction of the Chrysanthemum to Europe and this country.

A hundred years! If measured by the life-history of man, a hundred years is indeed a long space of time. A hundred years ago, and Wellington and Bonaparte were young fellows of twenty and one-and-twenty only; Nelson was but just married to Mrs. Nesbitt, and had not yet seen Lady Hamilton; and Byron was still in long clothes. A hundred years ago to-day, and I suppose my grandfather and yours were little toddling fellows just beginning to walk, or lads of eight or ten years at most; and since that time, our fathers have come and gone, and we are fast following in their steps.

But a hundred years, measured by the life-history of a plant in

its natural state, is absolutely nothing. It is scarce long enough to develop, much less to fix, any trifling natural variation from the type that may occur. And yet, look at the flowers we see around us here to-day, and compare them with the pictures, drawings, or descriptions of the flowers as introduced a hundred years ago! Compare them with the flowers of fifty, aye of twenty years ago! Now, how can we account for this marvellous development, this appearance of new and different types and classes, this almost *embarras de richesse* in varieties of the Chrysanthemum, produced and fixed in comparatively so short a space in natural plant-life history?

It appears to me to be simply and solely the result of the intelligence, diligence, and careful practical observation of gardeners, whether English or French, Japanese or Chinese. All plants, I take it, have inherent in themselves, as part of the dowry with which a good and wise God dowered them in the beginning, a marvellous capacity for development, improvement, and variation—a capacity which would in a natural state develop itself very, very slowly, taking centuries, and perhaps ages upon ages, to complete; and even then, probably, by far the great majority of variations and developments would never live to become established and fixed forms, but would perish in the great natural struggle for existence—the strong and coarse varieties overshadowing and stifling out the weaker growers, and the lower and more easily reproduced forms crowding out those of higher organisation and comparatively slower reproductive powers. But when once man takes a kindly interest in any plant, and bestows upon it his patient, watchful care, and his intelligence, the pace of development is vastly—immeasurably—hastened; and what would have taken ages and ages to appear in nature, and perhaps then would have failed to last, is accomplished by man in comparatively a few years, and is securely and permanently fixed and established for just so long as he chooses to continue and extend his beneficent guardianship and protection.

For though I recognise most fully the great and all-pervading natural laws expressed by the terms, “The struggle for existence,” and “The survival of the fittest,” yet I cannot but think that those laws, true as they no doubt are for all plants and animals and insects in a natural state, have no place, or

very little place, and very limited application, wherever and whenever man's truest intelligence is brought in as a factor. Certainly we shall all agree that these natural laws should find no place where man is dealing with his fellow-man. A struggle for existence with the powers and forces of the natural world we must all ever have, since work, labour, struggle—call it which you will—is a condition—a happy condition as I think—of our being ; but an internecine struggle for existence, as between man and man, should never find a place, and can never find a place, where man's truest intelligence, and man's highest capacities of kindness, long-suffering, and self-sacrifice are allowed to have free play. These higher capabilities will neutralise, and more than neutralise, the natural law of "struggle for existence," and will lead man—or Christian man at least—to desire, and to use his utmost endeavour to secure, the survival and wellbeing of *all* his fellow-men, instead of the fittest only ; and the happiness of all others besides—nay, even above and beyond—his own.

And as it ever should be—and to a great extent is—in the relation of man with man, so also, it appears to me, in his dealings with plants and animals, this same counter-balancing force is introduced as soon as ever, and whenever, the intelligence of man is brought to bear upon the point. He no longer permits the stronger to bear down the weaker, or the lower and more prolific forms to elbow out the higher ; and so, I think, it comes to pass that we have to-day all these wonderfully beautiful and various forms of the Chrysanthemum evolved, in so comparatively short a time, from the forms originally introduced. They are due to the kindly intelligence of gardeners, helping on the naturally existing law of and capacity for development, and counteracting that other natural law of "struggle for existence" which would otherwise have stifled, almost at birth, many and many a lovely, but less robust or less prolific, variety.

And therefore I think that, in looking round upon the multitude of lovely Chrysanthemums we have to-day, we gardeners may well be encouraged to go forward, not only with this same genus, but also with many another, being confident that, if the same observation, care, and kindly intelligence and love of plants be bestowed on them, we may, in years to come, reap a somewhat similar reward as that which crowns our hundredth anniversary to-day.

To human progress generally I do not believe that there is any limit whatsoever ; and I am not one of those who think that the human race was ever better, either as individuals or collectively, than it is at the present time. Although certain limited parts of it may perhaps deteriorate, yet I believe most fully that, speaking generally, the world as it grows older, grows better and happier also ; and I venture to prophesy most confidently that the men and women of a hundred years to come will be at least as great improvements on ourselves, as I firmly believe we are on those of a hundred years gone by. But as you will have noticed, if you have been kind enough to listen to these few remarks, I consider man to be absolutely distinct from and superior to plants and animals ; and though no doubt many natural laws are common both to us and them, yet some which apply to them do not touch us, and some which apply to us do not touch them. For instance, I cannot help thinking that there is a limit to the capacity of plants for development and improvement ; or, at all events, that there is a limit to the amount of improvement possible in any one given period. I mean that plants may, by natural selection or by human skill, advance step by step, and hand over hand (sometimes most rapidly), up to a certain point, and then there comes either a halt or a pause. They have either reached the utmost limit of their capacity for improvement, or they have, as it were, tired themselves out by a too quick march, and need a rest for years—it may be for centuries—before they are ready again for another period of advancement. This is but a theory of my own, but it is worth thinking over, and perhaps some day it will be acknowledged as a natural law. And I venture, simply as an illustration of this, to suggest to you whether such flowers, for instance, as the Carnation, the Begonia, the Dahlia, the Auricula, and perhaps—may I venture even to suggest it?—the Chrysanthemum, have not possibly already reached, or nearly reached, such pause or limit, *as far as the beauty of the flowers is concerned* ? But, even were it so, there remains still ample room for the gardener and skilful hybridist to exercise their intelligence and patience in improving the vigour, constitution, and habit of the plants, without losing or impairing by one jot or tittle anything of the really marvellous standard of beauty in the flowers which has been already reached. That there is ample scope for improvement in the habit, for instance,

of the *Chrysanthemum* no one will, I think, deny. Shorter, sturdier growth—something that brings the flower more naturally within the vision of the human eye, without the necessity of either steps to climb up to the heights, or of placing the pots as it were down in the cellar. Here is abundant scope for the skill of the most enthusiastic for, I venture to say, many, many years to come.

I should be glad also if some of you would turn your attention a little more to the production of a few more hardy garden sorts—sorts that can better withstand our slight November frosts and our by no means slight November damps and fogs. Anyone who will, as our American cousins say, “prospect” in this direction will earn the thanks of those thousands and thousands who are every year getting to love and appreciate flowers more and more, but who have not the means to erect glass-houses in which to grow or bloom them, and whose cottages and houses are consequently at this time of year bare, or almost bare, of the brightening, cheering presence of a nosegay, and destitute of that refining, elevating, purifying influence which we gardeners at least believe all flowers exert.

Many of you, I know, will not agree with the only other point that I shall mention; still, if I have to say anything, I do like to say just what I think; and that is, that in the cultivation of the *Chrysanthemum* too much stress is nowadays laid on size—mere size. You would not surely dream of determining the beauty of a woman by her size or weight! Much less should you do so with flowers. A monster potato, or a monster onion, or a gigantic vegetable of any other sort, may have some merit in the cook's eyes, as giving her less trouble to wash and peel,—but in her eyes alone, for never did you find anyone who did not think that one of more moderate, or even of actually small size, was vastly superior in flavour. I don't think I shall ever forget how, when I was gazing last year in rapt astonishment at some of the mighty *Chrysanthemums* at the Aquarium, a countryman, pointing at one of the huge incurved blooms, said to his wife, “Did ye ever see such a big un now? Why it looks for all the world, missus, like one o' your gert (great) big apple-doomplins.” A too big flower, believe me, is far less beautiful than a too small one; you can place two together, but you cannot conveniently cut one in halves.

Ladies and gentlemen, I thank you for so kindly listening to these few remarks, very hastily thrown together ; and, if I have wearied you by being so uninteresting, you must kindly put it down to my great anxiety not to trench in any way on any of the subjects which the readers of papers have already so kindly appropriated as their own ; for otherwise I should but have forestalled their knowledge by my own simplicity. And if I have been too long, you must remember that it is just as difficult sometimes for a layman, as it is proverbial for a parson, to be brief.

THE WILD PROGENITORS OF THE CHRYSANTHEMUM.

By MR. W. BOTTING HEMSLEY, F.R.S., A.L.S., Assistant for
India in the Herbarium, Kew.

DRIED specimens of a wild Chrysanthemum sent by Dr. A. Henry from Central China to Kew have thrown a new light on the parentage of the cultivated Chrysanthemums. As long ago as 1792 a Mr. Ramatuelle, when recording the introduction of the Old Purple, figured in the *Botanical Magazine* for 1796, plate 327, defined and described it as a species distinct from *Chrysanthemum indicum*, Linnæus, and gave it a specific name under the three genera Anthemis, Matricaria, and Chrysanthemum, in order to meet the diverse views of botanists on generic limits. Under Chrysanthemum he gave it the name of *morifolium*, a fact overlooked by Sabine and subsequent botanists.

Concerning the wild parent of *C. indicum* there has been no difference of opinion. Some of the cultivated forms are easily connected with it, while others, such as the "Chusan Daisy," may belong to this species, or may be of hybrid origin.

With regard to the wild parent of *C. morifolium* (*C. sinense*) there has been less certainty. Maximowicz took the slender plant which I have here named *gracile*—and I, in the "Index Floræ Sinensis," accepting this view without investigation, described the very different looking plant collected by Dr. Henry as a doubtful variety, under the name *vestitum*. At Mr. Dyer's request, I selected a number of sheets of dried specimens of

Chrysanthemum from the collection at Kew for exhibition at the Congress, and in doing this I saw that this supposed variety was much more like the large Chinese cultivated Chrysanthemum than is the slender plant from the North of China and Japan. Without careful comparison the slender specimens from North China and Japan might be regarded as a different species from Dr. Henry's plant, but I am of the opinion that they represent a slender northern variety of the same species. The Chinese specimens I have seen are all glabrous, or nearly so, whereas the Japanese specimens have thicker more or less tomentose leaves and outer involucral bracts.

I append a copy of the synonymy and bibliography of the two species, as prepared for the *Gardeners' Chronicle*, from which I have omitted references to many of the old writers, who merely copied from others and added nothing that was new.

1. CHRYSANTHEMUM INDICUM, Linnæus, *Species Plantarum*, ed. i. (1753), p. 889, excl. syn.; Sabine in *Transactions of the Horticultural Society of London*, iv. (1821), p. 326, tt. 12 et 13, et in *Transactions of the Linnean Society*, xiv. (1823), p. 144; Lindley in *Botanical Register* (1829), t. 1287; Roxburgh *Flora Indica* (1832), iii. p. 436, Clarke's Reprint, p. 604; Bretschneider, *Early European Researches into the Flora of China* (1881), p. 158; Hemsley in *Journal of the Linnean Society*, xxiii. (1888), p. 437.

Matricaria japonica flore minore, Breyne, *Prodromus fasciculi rariorum plantarum secundus, exhibens catalogum plantarum rariorum anno 1688 in hortis celeberrimis Hollandiæ observatarum*, p. 66.

Tsjetti-pu, Rheede, *Hortus Indicus Malabaricus*, x. (1690), p. 87, t. 44.

Matricaria maderaspatana, Petiver, *Musei, Petiveriani* (1695), centuria viii. p. 76, saltem pro parte.

Chrysanthemum maderaspatanum, &c. Plukenet, *Almagestum Botanicum* (1696), p. 101, t. 160, fig. 6.

Matricaria Chusan, &c., Petiver in *Philosophical Transactions of the Royal Society of London*, xxiii. (1703), p. 1421; Bretschneider, *Early European Researches into the Flora of China* (1881), pp. 56 et 158.

- Matricaria sinensis, minore flore, &c.*, Plukenet, Amaltheum Botanicum (1705), p. 142, t. 430, fig. 3.
- Matricaria sinensis, &c.*, Vaillant, Act. (1720), p. 285, ex Sabine.
- Matricaria zeylanica hortensis, &c.*, Linnæus, Flora Zeylanica (1747), p. 198.
- Chrysanthemum procumbens*, Loureiro, Flora Cochinchinensis (1790), p. 499, ex Maximowicz.
- Matricaria indica*, Ramatuelle in Journal d'Histoire Naturelle, ii. (1792), p. 240.
- Pyrethrum indicum*, Cassini in Dictionnaire des Sciences Naturelles, xlv. (1826), p. 149; De Candolle, Prodrômus Systematis Naturalis Regni Vegetabilis vi. (1837), p. 62; Maximowicz in Mélanges Biologiques, viii. (1872), p. 516 (excl. *β. plenum?*); Franchet et Savatier, Enumeratio Plantarum Japonicarum, i. (1875), p. 235; Franchet, Plantæ Davidianæ ex sinarum imperio, i. (1884), p. 167 (var. *lavandulæfolium*); icones in libris japonicis Phonzou Zoufou (1828), xiii. tt. 7-9; et So Mokou Zoussetz (1856), xvii. t. 22 (19).
- Chrysanthemum tripartitum*, Sweet, British Flower Garden, ii. (1827), t. 193.
- Chrysanthemum Sabini*, Lindley in Botanical Register, xv. (1829), sub tab. 1287.
2. CHRYSANTHEMUM MORIFOLIUM, Ramatuelle in Journal d'Histoire Naturelle, ii. (1792), p. 240.
- Matricaria japonica maxima*, Breyne, Prodrômus fasciculorum rariorum plantarum secundus, exhibens catalogum plantarum rariorum anno 1688 in hortis celeberrimis Hollandiæ observatarum, p. 66.
- Matricaria japonica maxima flore roseo*, Plukenet, Alma-geſtum Botanicum (1696), p. 243.
- Matricaria hortensis, &c.*, Kämpfer, Amœnitatum Exoticarum (1712), pp. 875-877.
- Matricaria sinensis*, Rumpf, Herbarium Amboinense, v. (1747), p. 259, t. 91, fig. 1?
- Matricaria indica*, Miller, Gardeners' Dictionary, ed. 8, (1768), quoad specimen in herbario Musei Britannici conſervatum.
- Chrysanthemum indicum*, Thunberg, Flora Japonica (1784),

- p. 320, nec Linnæus; Loureiro, Flora Cochinchinensis (1790), p. 499, excl. synonym.
- Anthemis grandiflora*, Ramatuelle in Journal d'Histoire Naturelle, ii. (1792), p. 234.
- Matricaria morifolia*, Ramatuelle in Journal d'Histoire Naturelle, ii. (1792), p. 240.
- Chrysanthemum indicum*, Botanical Magazine, x. (1796), t. 327; xlv. (1819), t. 2042.
- Anthemis artemisiæfolia*, Willdenow, Species Plantarum, iii. (1800), p. 2184.
- Anthemis stipulacea*, Moench, Supplementum ad Methodum Plantarum (1802), p. 258.
- Chrysanthemum purpureum*, Persoon, Synopsis Plantarum, ii. (1807), p. 461.
- Chrysanthemum indicum*, Botanical Register, i. (1815), t. 4; vi. (1820), t. 455; viii. (1822), t. 616.
- Chinese Chrysanthemum*, Sabine in Transactions of the Horticultural Society of London, iv. (1821), pp. 330-354, t. 14; v. (1822), pp. 149-162, t. 3, and pp. 412-428, tt. 17 & 17* (1824); vi. (1826), pp. 322-359, tt. 2 & 3; Transactions of the Linnean Society, xiii. (1822), pp. 561-578.
- Chrysanthemum sinense*, Sabine in Transactions of the Linnean Society, xiv. (1823), pp. 142-147; Sweet, British Flower Garden, i. (1838), tt. 7 & 14; Hemsley in Journal of the Linnean Society, xxiii. (1888), p. 439, var. *vestitum*.
- Pyrethrum sinense*, De Candolle, Prodromus Systematis Naturalis Regni Vegetabilis, vi. (1837), p. 62; Steetz in Seemann's Botany of the Voyage of the "Herald" (1857), p. 391; Maximowicz in Mélanges Biologiques, viii. (1872), p. 517; Franchet et Savatier, Enumeratio Plantarum Japonicarum, i. (1875), p. 235; Franchet, Plantæ Davidianæ ex sinarum imperio, i. (1884), p. 167; Phonzo Zoufou, Japonorum (1828), xiii. tt. 2-9, absque nominibus latinis.
- Pyrethrum chinense*, Ynouma Tsiodjoun, So Mokou Zoussetz, xvii. (1856), figs. 18 & 19 (15 & 16).

2A. CHRYSANTHEMUM MORIFOLIUM, Ramatuelle, var. *gracile*, Hemsley.

Pyrethrum sinense, Maximowicz, α *sinense* et β *japonicum* in Mélanges Biologiques, viii. (1872), pp. 517, 518.

A BRIEF HISTORY OF THE CHRYSANTHEMUM.

By Mr. C. HARMAN PAYNE, F.R.H.S.

WRITERS on China and Japan for many years past have concurred in assigning to the Chrysanthemum an origin of remote antiquity ; but, after much research, it is unsatisfactory to note that not one has endeavoured to fix, with any degree of certainty, the date when this popular flower became first cultivated as a florist's flower in those far-distant countries. The time allotted to the reading of this paper precludes anything like an explanation of the course pursued to ascertain some definite knowledge on this subject, and it must suffice for present purposes to say that the Chrysanthemum has in all probability been grown in China for upwards of two thousand years.

There is no doubt that this flower is indigenous to China, that it is a cultivated form of some wild plant long since lost or impossible to recognise now, and that, after it had acquired a worthy reputation in the Celestial Empire, it became introduced into the islands of Japan, there to obtain a measure of admiration equalling, if not surpassing, that bestowed upon it in its native land.

The earliest known reference in Chinese literature to the Autumn Queen occurs in the " Li-Ki " of Confucius, who lived, if we can trust the evidence of Chinese chronology, about five hundred years before Christ. In that work the celebrated Chinese philosopher makes distinct mention of the flower to which we pay our homage this day.

To come to somewhat recent times, we learn that one T'ao-ming-yang was a cultivator of no inconsiderable repute, and that in consequence of his successful cultivation the name of the city in which he lived was thenceforth known as Chrysanthemum City. I have used the expression " somewhat recent times " in the Chinese historical sense, for at the period when T'ao-ming-yang lived and grew Chrysanthemums our forefathers were under the dominion of the Romans.

What kind of flowers they were in those far-off times we cannot tell, but there is good reason for supposing they bore some affinity to the varieties introduced from China a hundred years

ago. Indeed, T'ao-ming-yang subsequently had many admirers and successors, five of whom published catalogues of their floral favourites, in one case over one hundred and sixty varieties being mentioned. Thus it may be assumed that the Chrysanthemums known then were flowers of some little importance and worthy of the designation of florist's flowers.

In Japan from time immemorial this plant has always been held in honour. A single variety in heraldic form is used as the national arms and official seal. The most popular *fête* is Chrysanthemum Day, and the people throw petals of the flower into their *saki* before drinking, in the belief that it is a potent charm against evil.

Both in China and Japan the Chrysanthemum appears profusely illustrated, and in the twelfth century of our era the swords of the reigning Mikado were decorated with designs of the flower. To those interested in the artistic features of the Chrysanthemum, the Oriental collections of pottery and paintings at the British Museum and South Kensington Museum offer ample opportunities.

Among the European botanical writers, Dr. Jacob Breynius in 1689 first described, in his "Prodromus Plantarum Rariorum," the object of our delight to-day. He called it *Matricaria japonica maxima*, giving a list of six varieties which were stated to be growing in Holland at the time he wrote. It is on this account that some people consider the year 1889 as the bi-centenary of the Chrysanthemum; but it is a matter of curiosity that the varieties mentioned by Breynius soon passed out of existence, and that when the event which is the cause of this meeting occurred, the Dutch gardeners were absolutely in ignorance as to anything concerning them.

Other authors of repute, such as Rheede, Plukenet, Kæmpfer, Rumphius, Thunberg, Loureiro, and many more besides, unite in testifying to the beauty of the Chrysanthemum. They differed materially in the name, and do not in any case allude to it other than as a foreign flower which they had heard of or seen in their travels. Breynius, therefore, up to this point is the only one who describes it as being in cultivation in Europe.

Mr. Sabine, the Secretary of this Society sixty years ago, has left behind him much interesting historical information. We learn from him that in the year 1764 a small-flowering

variety was growing in the garden of the Apothecaries' Company at Chelsea, under the name of *Matricaria indica*. It is extremely doubtful whether this was really a *Chrysanthemum*, for the description in Mr. Philip Miller's dictionary, and the dried specimen preserved, do not tally. Whatever it was, it soon perished, and the fact remains indisputable that, until the year 1789, nothing like a large-flowering *Chrysanthemum* is known to have been cultivated in Europe without intermission.

In that year, notorious for many events in the history of France, a M. Blancard (usually called Blanchard, an error for which French writers are mainly responsible) introduced from the Far East into Marseilles, his native town, three plants of a flower that was destined to play an important part in the annals of horticulture. They were not at that time recognised as *Chrysanthemums*, but regarded as large-flowering Camomiles. Only one, however, survived, and this became subsequently known as the old purple *Chrysanthemum*. M. Ramatuelle in the *Journal d'Histoire Naturelle*, wrote a very exhaustive account of the new-comer, and contributed to spread it abroad to a great extent, as he had formed a high opinion of its value as a late autumn-blooming flower.

The following year M. Cels, a celebrated Parisian nurseryman, and afterwards a foreign corresponding member of this Society, sent plants to the Gardens at Kew. We hear but little of it until Curtis, in the *Botanical Magazine* for 1796, figured and described it as having flowered the previous November at Colvill's nursery at Chelsea. He, like some of the French botanists, called it *C. indicum*, and by this name it was botanically known for many years.

English horticulturists were not slow to appreciate its value. Within a few years of its introduction here further importations were made, and Mr. John Reeves, the Society's agent at Canton, sent over some new kinds. Mr. John Dampier Parks, a traveller employed on their behalf, also augmented the list to a considerable extent. At Chiswick, in the Horticultural Gardens, there were twenty-seven varieties cultivated in 1824, and two years later the number appears to have grown to forty-eight.

The style of nomenclature in vogue at this period bore little resemblance to that of the present. The flowers were distin-

guished by names denoting peculiarity of form and colours; thus such appellations as "the starry purple," "the quilled pink," "the expanded purple," "the clustered yellow," were deemed sufficient. The Chrysanthemum fancier, in the days of the "First gentleman of Europe," found it impossible to adopt translations of the original Chinese names, as they were often too quaint and difficult. We need only cite a few examples for our purpose, as "dragon's brains," "yellow Buddha's head," "full heaven of stars," and "the heavenly interview" Chrysanthemum, the latter being evidently a progenitor of some of our tall-growing varieties, like Mme. Clemence Audiguier.

After a splendid exhibition of Chrysanthemums in the Chiswick Gardens, where upwards of 700 plants in full bloom were shown, much interest appears to have resulted. The Society, desirous of extending the culture of the now favourite flower, distributed plants and cuttings among the nurserymen living in the vicinity of the metropolis, and thus the Chrysanthemum became speedily spread abroad. In a short time after, complaints seem to have been prevalent as to the impossibility of propagating the flower by seed. Indeed, the ripening of seed has, owing to climatic influences, always been a subject of deep regret to the English enthusiast, and the difficulties are not likely, perhaps, to be lessened. The first efforts in Europe were purely accidental. In 1826 M. Bernet, a retired lieutenant in the French infantry, who lived at Toulouse, discovered on some plants of his growing that the withered flowers bore seeds. These he sowed in the following year, and was rewarded for his labours by the addition of some new varieties to his then limited collection. M. Bernet continued the work for many years, and to this present day the amateurs of Toulouse regard him as the father of the Chrysanthemum in France, and in the hall of the local horticultural society a large oil-painting of the retired soldier is hung in grateful admiration.

In England we were not long behind the French. Mr. Isaac Wheeler, of Oxford, raised a few seedlings in 1832, and exhibited them at a meeting of this Society in December of that year. He received in recognition of his flowers, which were poor insignificant things compared with those we see to-day, a Silver Bank-sian Medal. A little later Mr. Short and Mr. Freestone in Norfolk devoted attention to this interesting method of cultiva-

tion, and an historical point of no little importance is that Nonpareil, an incurved variety often met with now, is attributed to Mr. Freestone.

Concurrently with the extension and popularisation of our favourite, a German horticulturist published in 1833 the first-known treatise on its history and culture. It must also be recorded that several attempts at classifying the kinds then known occurred about this time, the principal one being that drawn up by Mr. A. H. Haworth. The year 1834 began with fifty-three varieties being known, but the number was soon to be increased to a large extent. An amateur in Jersey raised a number of seedlings about 1835, which were purchased by Mr. Chandler, of Vauxhall, and upon their appearance the superior qualities of the Jersey novelties were much appreciated, and at the meetings of this Society Mr. Chandler became a frequent exhibitor with a long-continued run of success.

So far as can be learned from contemporary literature *Chrysanthemum* shows in the present sense of the word had not been instituted. The earliest record is that one was held in December 1836, at Swansea, and another at Birmingham in the same month and year. At the latter place a specimen plant with eighteen branches and over eighty flowers attracted some attention, and a silver cup was awarded to its exhibitor. It was the variety called the Golden Lotus-flowered *Chrysanthemum*, a name curiously enough borne by a variety cultivated in China fifty years before, with which it was probably identical.

We must pass over the occurrences during Mr. Salter's residence in France between 1838 and 1848 with but a few words. He obtained a complete collection of the best kinds then grown both in England and France, to which were added the most valuable of the Jersey varieties, and devoted himself to the improvement of the *Chrysanthemum* in a way not necessary to be recounted before a meeting like this.

The year 1846 was the beginning of a new epoch in our subject. Mr. Robert Fortune had been sent to China at the instance of this Society on a botanical expedition, and during his absence he despatched to this country many horticultural rarities. The flora of the Celestial Empire was not then so familiar to us as now, and among the treasures he obtained were two small-flowering varieties of *Chrysanthemums* grown

and held in great esteem by the florists of the island of Chusan. Towards the close of the year one of these new flowers, called the Chusan Daisy, was staged at the Society's rooms, but the attention it attracted was of no account until it got properly into the hands of the Continental florists. Then such men as Lebois, Miellez, and Pélé proved what it was capable of, and they annually contributed vast numbers of the new species, to which was given the name of Pompon. The labours, too, of Mme. Lebois, who for some years after her husband's decease eagerly devoted her attention to the raising of new seedling Pompoms ought not to be forgotten.

Many and frequent are the lamentations that the *Chrysanthemum* did not bloom earlier than the end of October or middle of November. We find no evidence of anything blooming at an earlier time of the year until somewhere about the year 1850. The summer-flowering varieties for many years appear to have been confined to the Pompon section, and made but little progress in the estimation of the public until ten or twelve years ago.

Towards the close of the fifties a fresh impetus to *Chrysanthemum* raising was given in the Channel Islands, Charles Smith being the pioneer in the work. In his footsteps shortly followed growers whose names are still famous, such as Thomas Pethers, James Davis, and Alexander Clark. Many of their productions were purchased and distributed by Mr. John Salter and Mr. Bird, of Stoke Newington renown. A marked improvement had already taken place in the form and build of the show *Chrysanthemum*, and the Incurved bloom had been by competent authorities recognised as the standard of perfection. Large numbers of the Guernsey seedlings were varieties of that section, although among them were found Anemone, Reflexed, and Pompon flowers of the highest merit, many of which still retain a leading position on the showboards of our foremost exhibitors in this Centenary year. Time prohibits even the briefest enumeration of their gains, but I cannot refrain from observing that, out of all the numerous sports obtained these past ten years, by far the larger proportion have originated from these Guernsey seedlings. So, from 1858 to 1868 were halcyon days for the lover of Incurves, and numerous societies whose special object was the cultivation and exhibition of the *Chrysanthemum* sprang into existence with surpassing rapidity.

The dawn of a new era, the chief, according to my opinion, in the history of the Chrysanthemum, occurred in 1861. Mr. Fortune during his second visit to the Far East sent home seven varieties of new Japanese Chrysanthemums to Mr. Standish, of Bagshot. They were exhibited at the Royal Horticultural Society in the autumn of that year, without, however, finding very great favour in the eyes of the growers. Their season of flowering was rather later than those of the same kind now, and for a time they gave no signs of increasing in numbers to any appreciable extent. Eleven years after their introduction, according to Mr. Adam Forsyth's catalogue, there were but thirty-five sorts obtainable, a striking contrast to the lists of 1889. What surprises are in store for us in the near future no one can tell, but I venture to predict there will be many, for the remarkable extension of Chrysanthemum-growing in all parts of the globe must inevitably lead to much that we can scarcely conceive. In America vast strides are annually being made, and already growers like Dr. H. P. Walcott, Mr. Thorpe, Mr. Spaulding, Mr. Fewkes, Mr. Waterer, and others have become famous by either importing or raising new and varied sorts. In Belgium the famous flower has been taken up with great enthusiasm, the movement having been led in the first instance by the Royal Agricultural and Botanical Society of Ghent three years ago. France, with men like Simon Delaux, Louis Lacroix, Dr. Audiguier, M. de Reydellet, M. Boucharlat, and many other raisers of recent date, has long been foremost as the native country of more than half of our leading exhibition flowers, and now even her great rival, the German Empire, is beginning to feel the throes of Chrysanthemum excitement.

It would not be just to conclude a paper of this description without making a passing mention of English raisers. They have as yet taken but a few steps upon the road, but the results are promising in the highest degree; Messrs. Cannell, Laing, and Stevens have so recently as the last three or four years given us a foretaste of many floral joys to come.

NEW VARIETIES OF CHRYSANTHEMUMS.

By Mr. E. MOLYNEUX, F.R.H.S.

MUCH attention is naturally given to the introduction and development of Chrysanthemums, and rightly so, for if the supply of new varieties were to cease, the great and increasing interest in what is justly styled the Queen of the Autumn would not be sustained. I do not mean to say that a lesser number of plants would be cultivated, because the demand for flowers for various purposes would have to be met; but few persons will deny that the intense interest now displayed in the Chrysanthemum is largely attributable to the introduction of new forms. While old friends of proved worth are greatly valued, new are sought for, in the hope of finding distinct features in them, and new points of merit, yearly. There is nowadays such a craving after novelties that sterling new kinds are sure to meet with their just reward at the hands of the public. Of one thing I am positive, and it is this. If those persons who are responsible for the description of new varieties were to be more careful in setting forth their distinct qualities, and adopt a more simple and exact method of describing their colours, they would add much to the interest which is already felt in the introduction of new forms in any section of this extensive family. I have not come to that conclusion without good reason. The colours in the case of many sorts are so glowingly depicted, hence complicated, that it is much too difficult a matter to find them in the flowers.

I do not suggest that the new varieties sent out annually, and which, unfortunately, in some instances are merely reproductions under new names, are wilfully overpraised, but I do think that, with a better system of proving accurately whether a variety is really new, distinct, and good, before being distributed, more confidence would be felt in new varieties and the demand for them largely increase.

It is annoying, after spending money and time in cultivating what was thought to be not only new, but improvement upon existing varieties, to find they are neither one nor the other. Such experience as that creates mistrust and a relaxation of interest in kinds of which nothing is known beyond catalogue

descriptions. I will mention one example of disappointment of the nature indicated. A variety in the incurved section has been grown for trial this season under the name of Belle Poitevire, described in several catalogues thus, "incurved, large, flowers pure white, reverse slightly rose as it declines." After ten months' care bestowed upon the plants the blooms prove this so-called novelty to be none other than our old friend Mrs. G. Rundle, which usually assumes a slight rose colour when the petals lose their freshness. I now pass on to notice some varieties of recent introduction that I think are worthy of being called improvements, either in form or colour, on their predecessors.

Taking the incurved section first, I find that during the last ten years only fourteen varieties have been added which are likely to retain their position; this is a slow rate of progress certainly. With two exceptions, Jeanne d'Arc and Mr. Brunlees, they are sports, and because of this the additions reveal no new character except in two instances, and these of a slight nature only—Lord Alcester and Mr. Bunn; the former is a sport from Golden Empress of India, and perhaps the finest type of an incurved Chrysanthemum, owing to the superior general "build" of the blooms over that of its parent and all others; and the latter variety by the better formation of its petals over its parent, Golden Beverley. By the introduction of new varieties we gain additional colours, which enable us to retain in cultivation only those which are good in form as incurved flowers, hence raising the general standard of quality all through a collection, provided we banish the inferior in colour or quality. The variety which has produced the largest number latterly of sports is Princess Teck, viz., Mrs. Norman Davis, rich golden-yellow, which sported from the type in 1886, and in time produced the deep bronze-red, centre cinnamon, named Charles Gibson; Lord Eversley, a pure white variety from the original type, followed; and, lastly, Lady Dorothy, paler in colour than Charles Gibson. Although these may be termed new, the parent is quite equal in every respect, if not superior, to any of the progeny. Princess of Wales and her offspring Mrs. Heales have lately produced two splendid varieties, Violet Tomlin and Miss M. A. Haggas, the former purple-violet and the latter a light golden-yellow; the form of each is quite of the best, and they are valuable additions. With the exception of Bronze Queen of England, introduced three years since, no new

variety has been obtained from the Queen family, although two or three supposed new sorts are said to be distinct, but they need further trial to warrant their admission. I have here grouped the new varieties in the incurved section in two grades of merit.

First-class sorts that are likely to wear well.—Violet Tomlin, Miss M. A. Haggas, Mrs. Norman Davis, Charles Gibson, Lady Dorothy, Lord Eversley, Lord Alcester, Lord Wolseley, Mr. Brunlees, and Jeanne d'Arc.

Second-class sorts, useful but likely to be superseded.—Bronze Queen of England, Mr. Bunn, Mabel Ward, and Alfred Lynes.

The Japanese section is much more productive of new distinct and improved varieties entitling them to a leading position in the lists. Whereas the incurved section produced only fourteen good varieties in ten years, as many as fifty possessing good qualities have been introduced in the same time in the Japanese section. Edwin Molyneux is distinct in type and new in colour, therefore desirable. Elaine forms a type in which Avalanche is a decided improvement; indeed, it is not too much to say that this variety is the finest white Japanese Chrysanthemum in cultivation. Mlle. Louise Leroy, introduced last year, is of the same character, white with a faint tinge of blush, and of excellent quality. Eynsford White, a variety of this year, comes under the same category, being of first-rate quality, and so does Mrs. J. Wright, snow-white and of pleasing form.

Sunflower belongs to Jackson's Duchess of Albany type, and is an advance upon that variety. In fact I have no hesitation in saying that it is the finest of yellow Japanese varieties; the colour is a rich orange-yellow, the florets are long and droop gracefully. Mons. Bernard is similar in character, violet-amaranth in colour. Stanstead Surprise is a purple-magenta, somewhat after the same form of flower.

Mrs. Falconer Jameson, grown for the first time last year, is of the Triomphe du Nord character, but a decided improvement on that variety in the size and solidity of its blooms. The colour is a peculiar mixture of chestnut, bronze, and yellow, with the under side of the florets pale gold. In habit of growth it is dwarf, producing very fine blooms at a height of 3 feet only.

Florence Percy is new in character; the florets pure white,

each being split or forked at its point, somewhat resembling blanched moss-curl'd Endive.

Puritan, a new American variety, peach colour, changing to white, belongs to the Belle Paule type. It has pure white blooms; these, however, from early and late buds being quite different in character, which gives it a great range in variety.

Etoile de Lyon displays another character; the blooms are of extra large size; the florets in the early blooms being both fluted and quill-formed, gives it a coarse appearance. The colour is lilac-rose, shaded silver. George Daniels and Condor are distinct from others by the formation of their florets, which are extra broad and semi-drooping; the colour of both may be termed white, with a faint tinge of pink.

Mrs. T. H. Spaulding has pure white broad florets, recurved slightly at the points. This is likely to be a sterling variety.

Sokoto is a clear canary yellow, of the character of Grandiflorum, and so also is L'Or du Japon.

Mrs. Andrew Carnegie is entirely new in colour—a dark velvety crimson—belonging to the semi-incurred class.

Mme. John Laing, introduced in 1885, is a new type, having flat florets of a pointed character, those in the centre being erect. From this variety sported during 1887 another named Sarah Owen, colour golden-bronze, shaded rose, the florets tipped with gold.

Mrs. Frank Thompson and W. G. Drover are synonymous; the former, I believe, is the correct name. It is of American origin, and is entirely new in character. The blooms being of huge size, the florets deeply and irregularly notched at the points, white striped purplish-lilac, the colours being indistinct, coupled with its rough appearance, this variety will no doubt be superseded by others.

Thomas Stephenson is a sport from Criterion, retaining the form of that well-established variety; the colour, orange-red, is pleasing. Here, again, I have grouped the kinds according to their order of merit, in a similar manner to the incurved varieties.

First-class Sorts.—Edwin Molyneux, Avalanche, Mlle. Louise Leroy, Eynsford White, Sunflower, Mons. Bernard, Mrs. Falconer Jameson, Ralph Brocklebank, Florence Percy, Puritan, Etoile de Lyon, Mrs. T. H. Spaulding, Condor, Mme. John

Laing, Sarah Owen, Thomas Stephenson, Lady Lawrence, Mrs. H. Cannell, Mme. Bacco, Hamlet, Carew Underwood, and Mr. H. Cannell.

Second-class Sorts.—Mrs. J. Wright, Stanstead Surprise, George Daniels, Sokoto, Mrs. Frank Thompson, Lady Cave, Mrs. C. Orchard, Alpha, Bertha Flight, Fimbriatum, Mr. Garner, and Maggie Mitchell.

Varieties which do not fulfil expectations.—Edouard Audiguier, Albert Victor, Eclipse, Good Tidings, and The Intended.

Reflexed varieties receive but few additions. With the exception of Cullingfordii, which was introduced in 1883, and Elsie three years later, and Putney George in 1887, we have no others which call for comment.

The large or show Anemone varieties have been recently supplemented by several kinds likely to maintain their reputation, Mons. Pankoucke and Nelson being the latest additions. The former is a bold flower, combining both a good disc and guard florets; the colour is more peculiar than pretty, being a deep brownish-red. The latter a dull rose colour, but of good quality.

Sabine, as far as its colour—a soft yellow, or deep primrose—goes, is a welcome addition to a class with so little range in colour.

Mrs. J. H. Taylor is similar to Nelson in form, but differs in the colour, being rosy-lilac.

George Hawkins is a sport of this year from Georges Sand, which promises to be a capital addition to the large Anemone class. The disc is deep yellow, while the guard florets are lemon colour.

Miss Annie Lowe sported from Lady Margaret three years since. The guard florets are bright yellow, the disc lighter; quite a first-class variety.

J. Thorpe, junior, is one year older, but on account of its rich orange-yellow colour should be classed as one of the best new introductions.

The Japanese Anemone class has produced several new sorts of late, which add much to the usefulness of this section, as it rather lacked variety in colour.

James Weston is the most interesting new variety of this year. The long outer guard petals are pure white and droop gracefully; the centre, or disc, is canary yellow.

Souvenir de Mme. Blandinières is deep rosy-crimson, tipped with gold in the centre of the disc, which is full; the guard florets drooping.

Jeanne Marty, although introduced in 1886, did not become generally known until last season. It is, perhaps, the finest variety in this section in point of quality, having an especially large lilac disc; the drooping guard florets are blush-white.

Single varieties have largely increased during the last three or four years, so that now there are a goodly number, in shades of colour from snowy-white to purple-red. Jane, or Snowflake, is perhaps the finest white variety; America, blush; David Windsor, chestnut-red; Admiral Sir T. Symonds, deep orange-yellow; Mrs. A. Le Mout, amaranth-crimson; and Souvenir de Londres, rich crimson, are some of the most noteworthy of newcomers. Mary Anderson being exquisitely formed, the flowers white with a faint tinge of blush.

Pompons and Anemone Pompons call for little comment; nothing very startling has been added to these of late, if I except Mlle. Elise Dordan (in the former section), which is generally admired for its neat form of flower and pleasing colour—soft lilac-pink.

JUDGING CHRYSANTHEMUMS: MEN AND METHODS.

By Mr. J. WRIGHT, F.R.H.S.

SEEING that as much depends on men as on methods in the discharge of the duties in question, I will endeavour to give a little consideration to both, commencing with the former.

A season seldom, if ever, passes without the qualifications of persons who are appointed to officiate as judges at the chief Chrysanthemum shows being questioned by writers in the gardening press. To that I presume they have not the slightest objection. Honest criticism is wholesome in taking conceit out of men, and putting them on their mettle in the work they undertake.

One of the favourite grounds of complaint against certain judges is, that they are not "growers" of the plants and blooms the relative merits of which they are called on to determine.

I will endeavour to go to the root of this matter. First, who are the objectors, and what is their experience? Secondly, who

are the judges, and what are their credentials? And thirdly, who are those who make the appointments, and what are *their* qualifications? This last is a very important question, as we shall see.

As I am not a rigid adherent to the principle that "he who drives fat oxen must himself be fat," I will endeavour to touch on each question on its merits.

First, then, who are the objectors? Some, though very few indeed, who appear to acquiesce in the soundness of the above curious dictum, may be actual and excellent cultivators, but the majority are not. One of my friends frankly told me he thought only growers of Chrysanthemums should act as judges. Now, mark, this candid friend of mine never had any training in gardening, and never unaided grew a Chrysanthemum, yet he had a few plants under which he claimed as a "grower," and asked me to mention him favourably as a judge when I could not accept invitations in consequence of prior engagements. It is clear, then, that one at least of the objectors to appointed judges was not a judge and wanted to be one. He failed to get an appointment, but I think found relief "through the press," for editors are compassionate beings when a racily written paragraph comes in their way.

Next, what are the credentials of those men who are the most in demand for officiating in the chief classes of Chrysanthemum shows in various parts of the country, and who are engaged nearly a year in advance? Some of them are still cultivators and occasional exhibitors; others have been engaged in growing the plants for perhaps a quarter of a century, and have had opportunities of inspecting the best work of the best men in the greatest possible number of shows in widely separated districts. Or, in other words, long experience in the garden has been supplemented by that of the exhibition hall, and they ought to have gained knowledge by the splendid object lessons provided there. Yet some of these men are alluded to as non-growers, and suggested on that account as not the most competent to judge the work of others; but all the same, if the principle on which the objectors base their argument is sound, an ex-collegian is not fit to be a lecturer on subjects for which he has gained honours; an old schoolmaster is not fit to be an examiner of schools because he has passed through them; or an old cricketer is not fit to be an umpire.

But who selects the judges of Chrysanthemum shows ? Committees of Chrysanthemum societies. And of whom do these committees consist ? Of the leading growers and the best business officials. When it is proved that the aggregate capacity of these growers and officials is inferior to that of some individual who objects to their selections, he will be in a very strong position, and not till then. He is only strong when they are weak, and therefore, conversely, he must be weak when they are strong ; and, to go a step further, can only be right when they are wrong, for on them rests the responsibility of the appointments.

And now, why are certain judges chosen to act at exhibitions and in classes of national importance ? Men are selected because of their past experience, not as cultivators only, but as judges—men whose awards in keen competition have been tested by experts, in cases of protest, and whose verdicts have never been overturned. It is only natural that should be so, and it is well known that the more experienced the judges the fewer the protests. It may, perhaps, be thought that these observations imply that only old hands should be employed in the work, and young and fresh men systematically excluded. That is very far from being in accordance with my views. I think young men possessing knowledge should, wherever it is possible, be appointed to act with those of wider experience, and so become qualified to carry on the work as well or better in the future than it has been done in the past.

But apart from technical knowledge, a judge, old or young, must be absolutely without sympathy at a critical moment. Whether he knows to whom the plants or blooms belong or not, he must seal his soul against all feeling in favour of a particular man. If there is one point against the products of his friend or neighbour, he must give it against him as if he were an enemy. Judges have nothing whatever to do with exhibitors, but only with exhibits. This is one of the hardest lessons that local judges at local shows have to learn. Besides, they are often placed in delicate positions through their friendship, or the reverse, with exhibitors whose produce they recognise, and in awarding the prizes are liable to be charged with favouritism on the one hand or vindictiveness on the other. Moreover, experience proves how difficult it is for a person to see things as they are when he is, as the mesmerists say, “ under influence.” Men who

are entrusted with the important work in question should be quite independent of all local influences ; they must be men of intelligence and high character ; of the strictest probity, absolute impartiality, and who can completely banish from their minds all thought of individuals, and concentrate their whole attention on the produce before them, with the object of doing strict justice to all. They must be prepared to incur displeasure, and even abuse ; but if they act honestly, and make few or no mistakes, the opposition of disappointed men will be lightly regarded, and, instead of its having a weakening, will have a strengthening effect on them as adjudicators.

So much for men, and we now come to methods of judging. Generally speaking, and for practical purposes, there are three distinct forms of exhibits in a Chrysanthemum show :

1. Groups of plants arranged for effect.
2. Trained specimen plants.
3. Cut blooms arranged in stands.

No strict lines of guidance can be laid down for judging groups. It is stated in many schedules that "quality and general effect (or taste in arrangement) shall be the leading features." Undoubtedly they must, for they are the only features that can render a group meritorious. But in some groups high quality of blooms predominates over tasteful association, and in others skill in arrangement predominates over superiority of blooms. Where are we then ? In a dilemma, and we look for means of escape by searching for faults, in the hope of finding more of them in one exhibit than in another. In a group superiority of blooms would lose weight in the summing up of the plants, and especially if those near the margin were to a large extent denuded of the foliage, or if the leaves were small and discoloured. These are distinct drawbacks, and mar the effect of an arrangement, however good the blooms may be, as also do naked obtrusive stems. These are much too prevalent, and there is the less excuse for them since dwarf plants, with large deep-green foliage down to the pots, and at the same time bearing good blooms, can be had by selecting plants for cutting down in May, and raising others from cuttings from well-chosen stems between April and August. Excellent marginal plants can thus be provided, and no pots need be visible except in the front row, and these, if clean and small, are

not offensive. Good foliage, then, must be combined with good blooms, while a well-finished margin is essential for rendering a group the most pleasing in appearance and generally effective.

The huddling of the plants together, making a smooth flat face of colour, and staking the blooms upright with unsightly sticks, imparting a stiff, formal, bristly appearance, are defects ; and a group so presented, though it contained the best blooms, lost the first prize in an important competition last year. With much shorter stakes, and a continuance in length of bending wire, the blooms could have been displayed to the best advantage, and the group would have won the position it lost. The blooms should be so disposed that their individual beauty is displayed, and the almost natural corollary of this is a certain relief, or freedom, that appeals to the judgment of persons of taste. Clear and decided colours are more effective than a conglomeration of neutral tints.

Freshness is an important feature, and large fading blooms, with the accompanying exhausted foliage, cannot be so highly regarded as blooms somewhat smaller yet bright and clean, with foliage fresher and greener ; but it must never be forgotten that plants which do not represent good culture, no matter how dexterously they may be grouped for the hiding of defects, nor how well the colours may be associated, cannot be relied on for winning a high position. A few well-grown incurved varieties give weight to a group, the Japanese sorts imparting elegance and richness of colour.

High quality blooms, fresh bold foliage, no unsightly stakes and stems, with freedom in arrangement, and pot exposure reduced to a minimum, are the chief factors in a first-rate group of Chrysanthemums, and in proportion as they are represented so will the prizes be awarded.

We next pass to trained specimen plants, and in no other form is high culture, with skilful manipulation, better displayed than in the production of the best examples. I wish to state very emphatically that, in my opinion, the large "stretched out" specimens which occasionally astonish the multitude do not of necessity represent excellence in production. They more frequently represent artificiality and distortion. Regard should be paid to the natural habit of Chrysanthemums in training them for exhibition. They are not trailing plants, yet the

method of tying down the stems, and lacing them over each other, forming a sort of network, with the ends turned up to the extent of 2 or 3 inches for showing the blooms, would almost appear as if not a few exhibitors thought they were of procumbent habit, and therefore endeavoured to improve on nature in finishing the plants. Such exhibits are violations of nature, and are never produced by the best growers of specimen plants.

The natural habit of the *Chrysanthemum* is upright and branching, and this character should be preserved in trained plants, not obliterated. For presenting them in the most approved form the length of the stems must often be apparently reduced, and so disposed that the blooms are the most effectively displayed in the aggregate, and the stem on which each is borne should be quite straight for a foot or more, with the foliage in its exact natural position. Though the stems may, and in certain cases must, be depressed, the bent parts should not be visible, but hidden by a wealth of luxuriant leaves, which at once manifest high culture and enhance the beauty of the blooms.

Travelling and judging in various parts of the kingdom, I find the majority of the trained specimen plants are not of that character, nor such as it is a pleasure to honour with prizes. Some of the best are staged at Birmingham, Southampton, and the surrounding districts, and creditable examples have been seen at Kingston, Walton-on-Thames, Brixton, and in the Westminster Aquarium. The mention of Brixton compels a pause, and I am sure all who were acquainted with the late Mr. W. Hall would, if they could, scatter over his grave a few of the flowers which he loved and grew so well. His grave is in the deep waters, but his gentleness of spirit, kindness of heart, devotedness to his calling, and skill as a grower of specimen *Chrysanthemums*, will not die while those who knew him best, and the excellence of his work, live to labour in the floral world. When he exhibited a few years ago his were model plants—not widely spread out as if to say, “Look how big I am!” but massive in stems, leaves, and blooms—compact without being huddled, and in which art and nature were so merged that there was no visible line of conflict between them. Not a twisted stem could be seen in those beautiful specimens, about 2 feet high, and bearing from eighteen to two dozen or more blooms equalling those in first prize stands,

and a mass of dark leaves hanging like thick drapery all round, half hiding the pots. Those are the specimens to which judges award silver cups, and the nearer plants approach them in excellence the greater is the pleasure in granting them the awards they merit.

The training is simple. The stems when bent are coiled at the base, instead of near the tips, and several weeks before the blooms develop instead of just before a show. The former is the right method, the latter the wrong, and judges honour the right as far as they can, as it is represented in pleasing symmetry of outline, luxuriance of foliage, and massiveness, with richness and freshness of blooms rising up boldly as if each stem came from the centre of the plant without a twist or curve.

Pompons may be more dwarfed yet gracefully rounded (except in the case of pyramids), but the pancake style is hideous, and glaring twisted stems unsightly ; so they are in standards, and the better the foliage the easier they are to mask, especially if the training is not deferred too long.

In this paper the common order of things is reversed in giving priority to the points of merit in plants and their arrangement for winning prizes, and if their merits entitle them to this honour they will be in the best condition for home decoration. Plants, dwarf, well trained, in the best leafage, and each bearing a dozen or more of high-class blooms, afford greater evidence of skill in culture than is displayed in those that produce only two or three blooms on tall stems for cutting and arranging in stands. Moreover, there is more room for improvement in the former than the latter. Specimen plants have degenerated, and many recently arranged groups have been defective ; therefore I have dwelt on the weak points in Chrysanthemum culture with the view to their being strengthened by cultivators, so that judges may be better employed than they have been of late in meting out the awards in the classes in question.

A little must now be said on cut blooms. The advance in these during the last fifteen years has been marvellous. The best stands of incurved and Japanese varieties even a dozen years ago would not have the remotest chance of winning third prizes now in the best competition. Exhibitors have increased in equal ratio, and at no period in the history of the Chrysanthemum has the standard of excellence as represented in stands of cut

blooms been so high as it is now. And not only so, but there is a marked approach to equality in the products of the best exhibitors. This compels judges to exercise the greatest discrimination and adopt the best methods known to them in placing the competing stands in their right positions. Judging in great mixed classes in which trophies and prizes of a value not dreamt about half a generation ago, with the floral world waiting for the issues, is no light task. The work appears easy enough when it is done, and it is certainly easy enough to find fault with, but it taxes the resources of most men who have to do it in keen competition.

Judging by guesswork will not do nowadays in large close contests. A few years ago I heard a famous gardener proclaiming loudly against recording "points of merit." Intuition, he said, would always lead able men to a right conclusion after a general survey. I lived long enough to see that same man completely bewildered in a large class, and never saw anyone so ready to be extricated, as he undoubtedly was extricated, by the plan he condemned before he understood it. No judges would be so foolish as to waste time in recording the value of blooms in figures if the distinctions in the merits of collections could, as is the case with the majority, be perceived by a general broad comparison.

But there must be no jumping at conclusions. Nothing is so humiliating or so damaging to the reputation of an adjudicator as to see his verdict proved wrong by figures that he cannot disprove. Unless the differences in value are obvious to every judge, pointing should be resorted to. Let me give an instance of its necessity. In one of the most important of contests the loser and a few of his friends were taken by surprise. He entered a protest on the ground that the judging had not been done by points, and assuredly if these had not been produced, the whole work must have been done over again in a surging crowd. It is, of course, open for anyone to say, "You may be wrong in your points, and other judges would find a different total." True; but if a man know the varieties and the value of the blooms, there is no other way by which possible errors can be so well prevented. In the case in question three sets of judges pointed the blooms independently, with the result that out of a possible 576 points in the collections, there was only a

difference of two, one set counting one more, and the other one less than the responsible officials. That was perhaps the best piece of work Mr. G. Gordon and myself ever engaged in, and we do not expect to beat the record. The dispute was settled to the satisfaction of all but the loser, and by no other method could the accuracy of the verdict have been so clearly demonstrated.

It has been said that when the competition is so close that there is only a shade, so to say, or point of difference, equal prizes should be given, on the ground that one man gets so much more money than the other with such a trifling margin of merit. Judges have absolutely nothing to do with the "amount" of the prize money. Their duty is to accord to the exhibitor who "wins" the Honour of the position, and the closer the contest the greater the honour to him, also to the next in merit for running him so closely. Giving equal prizes is no doubt an easy way out of a difficulty, but almost always unjust to one of the exhibitors. I remember being with the late Mr. Charles Turner judging Dahlias at a great provincial show. The contest was close, and one of the adjudicators proposed to settle it in the manner indicated. "No, no," replied the great florist, "the boy there could give equals, but depend upon it there is a difference, and we must find it," and it was found. When a silver cup is provided, it is either won or lost. There is no dividing. When a prize is offered for the champion bloom in a show it is found. There cannot be a draw in such a case and the honour divided between two blooms. If a mark of superiority can be found in one bloom, surely it can be in a second and a third, and so on. That ought to settle the matter. It may be a question of trifles, but to disregard them is no trifle, for it is the aggregation of trifles that culminates in great results.

When I commenced judging, the work was done by three points. After sundry trials I found them insufficient, and proposed four as an advance, then six, as small differences in merit could be the better recorded. The six standard is now almost general, but in extremely close contests it is scarcely satisfactory. Times out of number I have known judges hesitate between giving six points or five, but they would give five and a half readily. I then made two columns for the figures, as in shillings and pence, placing the five points as 5*s.* and the half point as 6*d.* This was

again often divided and set down as 3*d.* or 9*d.*, as the case demanded, and the columns added together gave the result. It is as easy as A, B, C, and the acute florist, Mr. Ben Simonite, said it was the best system he had ever seen. Though I know there is no other in which the virtues of the blooms can be so accurately determined and tabulated, I force it on no one, and in nineteen cases out of twenty the subdivision can be dispensed with. If anyone wishes to see a practical example of it they can find it in the "Chrysanthemum Annual" for 1888.

Time is an element in judging, especially when that great blot of exhibitions, late staging, is allowed, and the quickest way even in pointing has had to be sought for. I think Mr. James Douglas has found it. Instead of taking the rows in a twenty-four bloom stand from left to right and setting down the value of each, he takes them from back to front in threes—says 6, 5, 4 points (mentally)—total 15, and so on with the eight cross rows, then adding up. That saves figures; and if what may be termed half points are recognised—thus, 5½, 5, 3½, as may be determined, we have 14 points to set down. I believe then we should be practically free from errors, and justice would be done in the shortest possible time.

Do you ask what kind of blooms score the most points? I answer, not necessarily the largest in the incurved section if they are loose, flat, rough, or stale; they must possess depth in proportion with width, firmness, freshness, brightness, clearness, and smartness. There is the difference, to use a familiar simile, between the well-formed, well-groomed, fine upstanding hunter, and the rough, shaggy, burly, slouching carthorse. How to produce and present the blooms in the best form is a question for cultivators. I cannot dwell on that. Time does not permit. I have gone on too long, but I hope you will remember that in writing, judging, growing, criticising, though we may each and all do our best honestly, and I hope pleasantly—all striving for the same goal, excellence—yet after all, and the best that all can do, this we must never forget, that "to err is human."

PROGRESS IN CHRYSANTHEMUMS.

By Mr. SHIRLEY HIBBERD, F.R.H.S.

It appears that the subject I am appointed to discourse upon is partly historical and partly biological, for the progress seen in the development of the *Chrysanthemum* corresponds with the progress of taste in selection, and illustrates the capabilities of the flower to respond to the demands of taste operating through time, with definite ends in view. By the term "taste" may be understood, in this connection, all that we might otherwise call science, art, or technical floriculture, for we employ the means at our command for the production of flowers of certain types and styles, and it is the taste, whether true or false, that influences our endeavours from first to last.

In the development of the flower from its earliest forms, as it came into the hands of Europeans, to the splendour in which it appears at this time, the florists have been the principal agents; but, happily, they have not been all of one mind as a party, bound by severe laws and obligations, but of very diverse tastes, and often operating in contrary ways; in many instances earnestly labouring and succeeding in obtaining forms that in other instances would have been, and actually were, regarded as undesirable, and even objectionable. As an example of the advantage to society in establishing a diversity of forms of a particular flower, the London florists objected without hesitation to the fantastic and often eminently beautiful forms of the so-called Japanese varieties that a school of florists in the South of France may be said to have doated on; while Frenchmen, on their part, cared but little for the sumptuous incurved flowers that were as emblems of all possible perfection to the florists on this side. But the men were better than the schools that owned them, and they soon perceived in each other's favourites beauties that should be recognised and qualities that should be encouraged.

I shall have to touch the history, but I will endeavour to keep clear of the connected story told by Mr. C. Harman Payne. And I shall have to touch on the raising of seedlings, and I will endeavour to keep clear of the ground that we hope and expect

will be admirably covered by Mr. F. W. Burbidge in his essay on that part of the business.

For the historical part of my argument I am bound to direct attention to the earliest flowers that were cultivated, and more especially those that became established between 1790 and 1820. It must be observed of these in a general way, to speak in the language of the exhibition, they were a very rough lot. The first that reached us was the veritable *Kiku*, which has become a most famous flower as figured in the *Botanical Magazine*, t. 327. It was a showy reflexed flower, so far attractive as to be likened to Dr. Sharpe of the present day, a few of our friends believing them to be identical. Not sharing in the belief, I am prepared to believe that Dr. Sharpe is many degrees superior in make and shape, but probably is of no better colour than its gay prototype.

If we may regard the *Kiku* as the first of the reflexed group, the question will arise, when did the first of the incurved appear? I submit to you that the variety *involutum*, figured in Sweet's "British Flower Garden," vol. i. plate 7, published 1823, is the first of the series in the historical view, and of true incurved character, although, in common with other early flowers, rough. It may be proper to keep in mind that with a little dressing, *involutum*, in a well-developed form, might be worthy of a place on the show table even now. It is enough for my purpose, however, to establish that at this early date we had the pattern of the incurved to serve as a guide in selecting and raising. In this department the English cultivators have had a great tide of good fortune, for this glorious group is almost wholly of home manufacture. We will call this the prototype of Prince Alfred, and hurry on to avoid having to encounter close comparisons.

We will now look for the earliest of the Japs. I find it in the series figured in Mr. Sabine's paper, published in the "Horticultural Transactions," 1822, and it is called the *Quilled Flamed Yellow*. If this came to us new this day we should class it as Japanese, and we might say that in character it comes near to Gold Thread or *Gloriosum*.

Prophetic patterns of three great groups being before us, we fail to find good examples of Anemone-flowered or of globular pompons, such as *Trevenna* or *Duruflet* of early date, but

examples abound that come near to them. The double *Chrysanthemum indicum*, figured by Sabine in the "Horticultural Transactions," 1822, may be regarded as the precursor of the pretty Drin Drin, while the *Small Yellow* of "Horticultural Transactions," 1824, may stand for Aigle d'Or or some such.

Of Anemone flowers any number may be found lacking the final finish of Lady Margaret, Gluck, or Queen of Anemones. In "Horticultural Transactions" of 1824 and 1826 Mr. Sabine presents figures that may fill us with delight even now, and that, at any rate, prepare the way historically for the Anemones and the single Japs by means of brilliant examples. The *Two-coloured Red* is a grand single with large disc and ray florets of a rich glowing crimson colour. The *Semi-double Quilled Pink* and the *Semi-double Quilled Orange* are such as we now class as single Japs of fine fantastic quality, from which we might hope to obtain Jap Anemones of the grandest pattern.

An observation of some importance appears to be necessary at this point. In the making of the Chrysanthemum we certainly did not begin with raw material. The majority of varieties introduced were obtained from the gardens of China and Japan; they came to us with much of man's work in them already, and, above all things, with that disposition to vary beyond all known limit which appears to become a characteristic of certain plants that have been long under cultivation. It cannot be averred that cultivation develops the initial impulse to variation, but it is certain that cultivation encourages it, for we all select for perpetuation the flowers that please us best, and in the end they represent our taste almost as much—sometimes perhaps more than as much—as they represent the species out of which they originated. Between the more characteristic of Chinese and Japanese Chrysanthemums the differences are great, but they represent the diverse tastes of the people much more than the diverse conditions of production. Forms that assimilate with the Japanese have unquestionably been introduced from China, but they are not specially characteristic of Chinese taste. The change in form and fashion may be traced from the North-west Provinces eastward through the Corea to Japan, where finally the reflexed and incurved groups are but poorly represented, while in place of them we have the magnificent absurdities that in the eyes of our public threaten to outshine the incurved, but

in the eyes of true florists only enhance, by the contrast of their grotesque and extravagant characters, the exquisite beauty and refinement of the incurved flowers.

We begin, then, with types of all the forms ready made, and not a few of the types of good quality, though for the most part rough. It will be seen in the sequel that the florists have not created any new form, but have improved all, and to those more especially favoured for exhibition purposes have imparted qualities that place our best *Chrysanthemums* as works of art in advance of all known florist's flowers. In power of expression, distinctness of character, in forms of beauty no less cheering to the heart than delightful to the eye, a beauty that is unique and the embodiment of the highest harmonies of plastic form, the *Chrysanthemum* surpasses all other flowers, not even the Rose, the Tulip, or the Dahlia being excepted.

If we ask for explanation of this, undoubtedly the initial form is the first to be considered. It is that of any ordinary Aster, a central circular table filled with tubular hermaphrodite florets for the disc of the single flower; and a circle of ligulate female florets for a boundary, a defence, a range of external attractions to lure to the fertile florets in the centre the insects required to effect fertilisation. The circle is the most perfect of all figures, and the source of all beauty of form and proportion; and related circles are inexhaustible in variations, as they are also in creative power in the production of curvilinear forms without end. We lose a grand primary feature when we have sterilised a flower by converting the tubular into ligulate florets; and, from the æsthetic point of view, the double Starwort is less beautiful than the single. But the loss of the disc which gives such a fine character to the *Anemone Chrysanthemums*, and in a less striking degree to all the single flowers, is compensated by the enlargement of the ligulate florets, and by the repetition over the entire periphery of their elegant ribbon or wire-drawn forms; moreover, their curvatures bring into the field circles, segments of circles, and modifications of circles without end, giving the imagination the task of leading where the eye cannot follow, and in the incurved flower displaying the regularity of an example of engine-turning, expressed in the delicate material and translucent colouring of the living flower. Nature has worked with this primary pattern in *Asters*, *Helianths*, *Pyrethrums*, and *Chrysanthemums* as though a mere

circle to begin with would suffice for her to fill the universe with varieties of beautiful forms, each having in itself the power to generate an infinity of other forms; and yet the simple circle should be the foundation from first to last—the Divine idea of the pattern of the orbs in space as well as the flowers that adorn them. You say all flowers are not composites, and not all are of regular form, but the circle underlies them all, and, like the world itself, each may be said to revolve upon a centre.

Geographical influences, probably, have been peculiarly operative in the development of the Chrysanthemum. Its range of territory in the Far East is greater than it has in the whole of Europe, and the peninsula of the Corea appears to have been especially favourable to the transition from the compact form originating in North-western China to the diffuse form prevalent in Japan.

The Corea is a cold mountainous country, and cold favours the doubling of the Chrysanthemum by suppressing fertility, for the tubular florets more readily change to the ligulate form when no longer capable of producing pollen in juxtaposition with active stigmas. Atmospheric humidity is about equally operative with cold in suppressing the reproductive power, and this again tends to the encouragement of doubling. Thus the Japanese, who obtained their Chrysanthemums through the Corea, have formed a race of flowers characterised by a profusion of ligulate florets of extravagant proportions and irregular forms; and our friends in the South of France, having a warm and dry climate, have been enabled to restore fertility by producing single and Anemone forms, the overplus of their seed-beds running to Japanese forms of infertility. Incurved flowers have prospered in this cold country, which is not only, to speak in a general way, too cold to ripen seed, but too cold for the production of the pollen that must precede the process. The names of the Anemone forms tell us whence they came, and the lesson of the story as thus viewed appears to be, that the first step towards obtaining Chrysanthemum seed will be to make a climate expressly for the purpose, and to encourage in that climate the production of tubular florets, for so long as you disbud and feed high, and repudiate discs, you may whistle for seed and grow weary of whistling.

In all the early forms of the flower it may be said there is suspicion of singleness. Observe the beautiful *Pink Quilled*, as

figured in the *Botanical Register*, 1822, t. 616. Here you have an extremely beautiful flower, with narrow rosy florets which incurve slightly, showing their silvery undersides at the points, and in the centre appears a half-concealed button, suggestive of a disc, in a state of transition, having become sterile possibly, but not yet having completed the doubling process. It is described as "remarkable for the incurved form of its florets, which shorten regularly and gradually towards the centre, forming a brilliantly pink full flower of about four inches in diameter." Sabine's *indicum* has a distinct disc which appears to consist of aborted tubular florets. Sweet's *tripartitum* of "British Flower Garden," vol. ii. plate 193, is a single *indicum* differing but little from Sabine's type. The *Kiku* of 1789 shows a centre likely to be fertile. The six beautiful flowers figured by Sabine in "Horticultural Transactions," 1822, include four singles, while the other two, though figured as doubles, would probably prove to have fertile centres could we but examine them as we do the flowers on the show table.

It is of the greatest interest to observe that, while we have in our system of selection co-operated with our cold damp climate in sterilising this flower, nature has not been utterly thwarted in her passion for multiplying varieties. The additions that have been made from year to year to our collections have comprised a large proportion of sports, these representing, probably, an initial power derivable from the seed, and possibly indicating that the pollen parent was of a different colour to the seed parent, for the stigmas of composites are not of necessity fertilised by pollen produced in the selfsame disc. This suggestion does not meet the case of any more than two forms of one variety, but as we have four Christines we shall want four pollen parents, unless we stretch the imagination to a case of the conjoint influence of two or more pollen grains from diverse sources.

Passing from the occult to the practical, we have to note that while on the one hand we sterilise the flower, and so reduce the probability of seed production, the plant, no longer having to prepare for that business, devotes its energies to the production of ligulate florets in profusion, and in what we may term gigantic proportions. Could we have an incurved flower with a fertile disc it would be but a poor thing, for the absorption of energy by the tubular florets would effectually check the develop-

ment of the ligulate florets, and so keep down, from the exhibition point of view, the quality of the flower. It follows, therefore, that we must go back for seed while we go forward for exhibition quality. But for the most striking and splendid decorative features to select the noblest incurved or tassel flowers for stud purposes will be a grave mistake. We must rather keep in mind how double Stocks and China Asters are obtained, for when these are completely sterilised there will be an end of them. While we make a climate for the work, we must find fertile forms for the climate; or, by a combination of roasting and starving, and allowing the plant to mature all its flowers, force the doubles back upon the single forms out of which they originated, that they may be fertile again and useful as seed producers.

Having thus studied the business anew, we shall look forward for results; and the question arises, have we anything to hope for in the way of new forms or new colours? May we expect to obtain a blue or scarlet Chrysanthemum? May we expect to substitute for the odour that now pleases few and offends many one that shall give universal pleasure, like that of the Violet or the Rose?

And here the question arises, is the blue Chrysanthemum of the Eastern pottery a fiction or a fact? You may find examples easily wherever works of art of Chinese or Japanese origin are in any plenty. One example shall suffice for my purpose, and I invite attention to what is undoubtedly intended for a blue Chrysanthemum on a beautiful jar of Japanese Cloisonné. It is a reflexed flower with rigid florets of a full blue colour, all defined with golden lines of Cloisonné work. The leaves that accompany the flower are clumsily drawn, but they do not suggest that any other flower is intended. On this same jar is a blue Pæony, which we may class with the Chrysanthemum as presenting at least a parallel problem.

Now it is a matter of some interest that the Japanese profess to have this flower and to keep it as a sacred secret. The love of the people for the flower is perhaps best embodied in the Festival of Happiness which occurs in the ninth month of the year, when the flower is in bloom, and is called *Kiku-dzuki*, when the Chrysanthemum enters largely, as the emblem of happiness, into all the ceremonies of the day. But the blue flower does not appear in this festival; it is reserved for religious uses; it is

jealously guarded against inquisitive vulgar eyes, and will only be seen by Europeans when the safeguards against intrusion are broken down by artifice, bribery, or treachery. So far as to the Japanese theory of the blue Chrysanthemum. It will profit nothing to multiply examples; but I will refer to one amongst many in the "Ceramic Arts of Japan," the valuable work of Messrs. Audsley and Bowes. In plate 15 of that work, representing pheasants and flowers, occurs a cluster of blue Chrysanthemums that have a more natural appearance than the average of examples. They are certainly reflexed flowers, and possibly were pompons of large size. Near them are some incurved Japs of a colour approaching scarlet. I cannot be wrong in describing these as blue, and yet the colour is of a tone that we may really hope to attain, for it is removed from the full deep azure of the example of the Cloisonné jar, and is sufficiently touched with rosy hues to permit the description of it as rosy lavender blue. I submit that a colour of this kind may be hoped for, as in accordance with the range of variation in the direction of blue already witnessed, as a fact. And I submit further that a fanciful artist, with a flower of this kind before him, might be tempted to suppress the red tone and intensify the blue tone without being over-fanciful in his picturing.

The flowers occasionally met with in Japanese art are the Chrysanthemum, Pæony, Wistaria, Lily, Hydrangea, Iris, Carnation, Convolvulus, and Water Lily. But the *Kiku* stands before all, and attains to the highest degree of artistic importance when conventionalised after the fashion of a star, with a definite number of rays for every special signification.

The Imperial Crest, termed the *Kiku-mon*, is a Chrysanthemum of the flat star pattern with sixteen rays or florets. And the question may now be put—if the flower is conventionalised in form, may it not also be falsified in colour?

Possibly we talk too freely of the fidelity to nature of the artists of Japan. They are human and inventive, equally capable of serious truth and boisterous fun, and in burlesque inexhaustible. What are their dragons that wind around their bowls but magnificent nightmares that carry the facts of nature into the region of the impossible, and justify any doubt we may entertain as to the *bona fides* of their painted flowers?

A chronological study of garden varieties will of necessity

throw some light on the nature and rapidity of progress in the development of floral qualities. Valuable aid in such a study may be derived from the catalogue of large Chrysanthemums, given in the "Garden Oracle" for 1889. This catalogue contains the names of about 1,760 varieties, with names of raisers, dates of distribution, class, and colour of flower, the whole arranged in alphabetical order for convenience of reference. With this before me, I take a list of the incurved varieties that are now in favour, and I make comparisons. It happens that incurved varieties at this time generally recognised as worthy of cultivation do not exceed a hundred in number; but while I deal with certainties, apart from doubts and speculations, I cannot extend the list beyond eighty. We will now consider how they rank in order of time.

The very first note to be made is in the nature of a startler. It is that Queen of England, still unsurpassed for beauty, the universal favourite as a model of form, and in all other respects worthy of its name, heads the list as the oldest of the series, and dating from the year 1847, when the first Chrysanthemum Society was but newly born and had almost everything to learn in the way of business, for in the same year it held its first exhibition. Shall we venture to say we have in this flower an embodiment of the highest floral qualities, and that in a run of forty years we have obtained nothing to surpass it? I will not venture on a declaration that can have no basis, in fact, apart from individual opinion. It is enough now to say that the late John Salter raised this true queen of queenly flowers, and that it exercised a potent influence on English taste which may be said to have culminated in the formal adoption in the year 1851 of the incurved form as the official form, or say the form that should have precedence of all others on the show table.

In the brief review I am now attempting the Queen stands alone. I find no other flower amongst modern favourites of earlier date than the year 1852, which claims *Beauty* and *Arigena*. The year 1856 gives us *Alfred Salter*, which has no companion in the list of modern favourites. We meet with nothing in the two years that follow, but 1859 gives us *Barbara*, *Golden Queen of England*, *Jardin des Plantes*, and *Yellow Perfection*. From this time the successive years are somewhat uniformly represented, as thus: 1860, *Novelty*; 1861, *Lady Hardinge*; 1862, *Empress*

of India, or *White Queen*, *White Globe* (of which there are two, one Smith's, the other Salter's), *General Slade*, *Nil Desperandum*; 1863, *Abbé Passaglia*, *Beverley*, *Golden Eagle*, *General Bainbrigge*, *Princess of Wales*, *Venus*, *Prince Alfred*; 1864, *Lady Slade*, *Mr. Brunlees*, *Mrs. Haliburton*, *Rev. J. Dix*, *Sir Stafford Carey*; 1865, *Empress Eugenic*, *Eve*, *Hercules*, *Lady Carey*, *Prince of Wales*; 1866, *Golden Beverley*, *Gloria Mundi*, *Hereward*, *John Salter*, *Mr. Gladstone*; 1867, *Faust*, *Hetty Barker*, *Isabella Bott*, *Lady Talfourd*, *Mrs. Heale*; 1868, *Bronze Jardin*, *Baron Beust*, *Enamel*, *Guernsey Nugget*, *Le Grand*, *Mrs. G. Rundle*, *Mrs. E. Sharpe*, *Miss Marechaux*, *Princess Teck*, *Princess Beatrice*; 1869, *Barbara*, *Blonde Beauty*, *Golden John Salter*, *Pink Perfection*, *St. Patrick*; 1870, *Miss Hope*; 1871, *Duchess of Roxburgh*, *Ensign*; 1872 was a bad year for everything, and it makes no figure in the present summary; 1873, *Hero of Stoke Newington*, *Refulgence*; 1874, *Emily Dale*; 1875, nothing; 1876, nothing; 1877, *Golden Empress*; 1878, *Mrs. Shipman*, *Rev. C. Boys*; 1879, nothing; 1880, nothing; 1881, *Angelina*, *Mr. Bunn*; 1882, *Jeanne d'Arc*, *Lord Alcester*, *Mabel Ward*, *White Venus*; 1883, *Lord Wolseley*, *Mrs. J. Crossfield*, *Sir B. Seymour*; 1884, *Duke of Teck*, *Mrs. Weston*; 1885, nothing; 1886, *Bronze Queen*, *Yellow Globe*; 1887, *Fingal*.

The dry list is, like many a dry tree, full of useful material. It points to some interesting, perhaps I may be permitted to say curious, conclusions. It shows by the list to which I subject the chronology of the incurved, the best varieties were produced from 1847 to 1871, since when the lists have been refreshed by sports chiefly, and the true seedlings have been secured through happy accidents rather than as the result of systematic effort, as in the case of those produced by Smith and Salter. In plain truth the incurved pattern was used-up in the course of twenty to twenty-five years, a result attributable not to the niggardliness of Nature, who can bestow new countenances on her children *ad infinitum*, but through the systematic sterilisation of the flower for the attainment of floral perfection. When it is clearly understood that to grow for the show-table and to grow for new varieties are ends incompatible, we may hope for a new era of variation in the incurved group, and the Chrysanthemum will enter upon a greater and grander phase of development than has been witnessed hitherto. Looking back from this point to

the collapse in 1871, I will ask you, where should we have been in this particular region of the floral world had not the new tide of Japs from the South of France arrived to keep us floating? In all probability we should not be here to-day to celebrate the Centenary; and so, however devoted we may be to the civilised beauties that stand for the highest range of perfection, let us not forget the services rendered by the savages that are so weak in artistic finish, but so strong in expression and the vigour that speaks of enduring vitality.

Imported incurved flowers may date from 1820, when *involutum* was obtained from China, but the first home-raised incurved date from 1836, when an amateur of Jersey originated several, of the history of which but little is known beyond the fact that they passed into the hands of Mr. Chandler, of Vauxhall, and, through him, were distributed. Concurrently, Mr. Freestone, of Norwich, raised many new seedlings, amongst them some that were incurved, and these, with the Jersey seedlings, were secured by Salter when he established himself at Versailles in 1838, and entered upon the career that has placed his name in a high rank in our floral Walhalla. Our business is not with the history except in so far as it teaches something of the principles of progression. Well, the raisers have generally kept their secrets, but Freestone has divulged that he selected semi-double flowers for seed production, and forced them into early bloom to increase his chances of success. In this way he secured fertility and a suitable climate.

The future of the Chrysanthemum may be predicated to this extent, that when distinctive forms no longer appear, it will have passed the meridian of its fame. It is not likely to "pass into nothingness," but the appearance of new forms from time to time will alone advance or sustain its popularity. But in the evolution of the flower many new features or modifications that will have the merit of novelty may reasonably be expected. If we do not see promise of blue or scarlet flowers, we may perhaps find comfort in the consideration that they are not wanted. If you will take a good stand of twelve or twenty-four, and having removed one flower, fill its place with a bunch of scarlet Pelargoniums, you will need no further persuasion that positive colours are not to be desired. It produces but one pure positive

colour, and that is yellow—a colour needing to be employed with caution in all decorative works.

In grouping these flowers it will be found that while rosy tones may predominate, an unpleasant effect is the certain consequence of a predominance of yellow. We have a parallel case in Roses, and nature has taken some care that the golden colour shall not spoil the Rose-garden or the exhibition table, by making rosy Roses plentiful, and yellow Roses few. We are less in need of further developments of the yellow tones than of the reds and purples in the Chrysanthemum, and we see in Progne and Julie Lagravère material of a promising nature for newer and richer tones of red.

Perhaps more than anything, the odour of the Chrysanthemum needs improving. There are varieties that are said to emit the odour of the Violet, the Rose, and the Musk; but the senses of all are not equal to the discovery of them. Considering that the composites are often highly aromatic, and that our flower inclines to the manufacture of a Camomile odour, there is some ground for hope that varieties, possessed of an agreeable fragrance may be secured, and if these appear with flowers of less than the highest merit, they should be preserved for the inauguration of a new feature that in time may become characterised by the highest floral qualities.

DISCUSSION.

Dr. MASTERS, F.R.S., in proposing a vote of thanks to the Chairman and to the readers of papers, said: The whole Exhibition and Conference to-day have been a triumph of the evolutionary theory. If Darwin, Herbert Spencer, or any of the modern apostles of the doctrine of evolution, had been here to-day, they would have been delighted at the exposition of their principles which we have just heard. We have heard also a great deal as to the survival of the fittest. But what is the fittest? I am sure you will all agree with me in saying that in our Chairman to-day we have an illustration of such survival. I must say also that we have another example in this grand old Society, which the papers read to us to-day show to have taken such a leading part in introducing, and to have since done so much towards establishing the growth of the Chrysanthemum in this country. Wonderful things has the old Society done in the past,

and wonderful things it is trying to do in the present, and I trust it may survive for very, very many years to come to be the pioneer of horticulture in this country. I refrain from touching upon subjects which have been so ably treated of already this afternoon, but I may say, as an illustration of what might probably be done in the development of the Chrysanthemum, that 500 varieties are known to botanists, but of these only two or three have as yet been utilised by the hybridist and gardener.

WEDNESDAY, NOVEMBER 6.

Mr. SHIRLEY HIBBERD, F.R.H.S., in the Chair.

THE QUEEN OF AUTUMN; OR, CHRYSANTHEMUM SEEDS AND SEEDING.

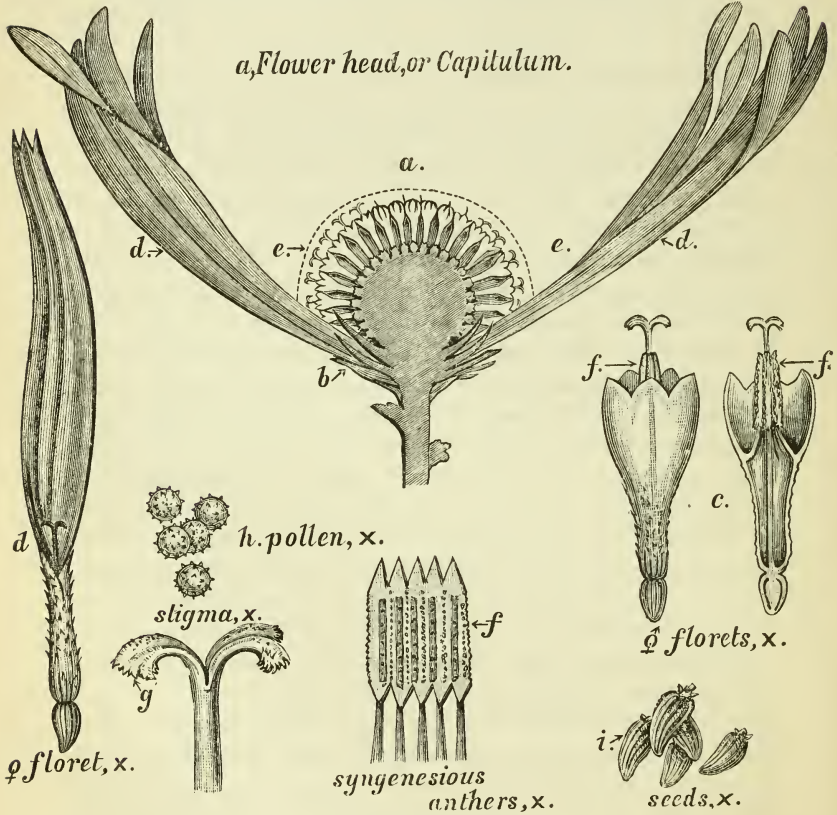
By Mr. F. W. BURBIDGE, F.R.H.S., F.L.S., &c., Curator of the University (Trinity College) Botanical Gardens, Dublin.

THE Chinese are a peculiar people, and in many ways different to the gardeners of the West. They are more insulated and self-contained. Less than a century ago China was the whole world to the Chinese. Although they live much nearer to the tropics than we do, they have not felt that soul-hunger for the plants of other and warmer lands than their own, which is such a characteristic feature in our horticulture of to-day. The mandarins, or nobles of China, allow the aristocratic Orchid to sway and flutter neglected on its native bough; but the one thing they do admire and value is their native Chrysanthemum, a flower which, with their neighbours the Japanese, they cultivate to perfection. It is the national flower of a great and powerful people, and not only of the conservative Chinese themselves, but of the more liberal Japanese, and also of the people of Siam. But what at the beginning of this paper I am anxious to emphasise is the broad central fact that the Chinese gardeners have gone out to their own waysides and hedges, and have brought into cultivation their own wild flowers. The Tree-Pæony, the Camellia, the Azalea, the Rose, and, above all, the Chrysanthemum, are a few only of their favourites, which may serve to illustrate what I mean. Mr. Fortune told us, after his second return from China, that the Celestial gardeners did not care for any of the plants he took out with him from England, except for the scarlet Zonal Pelargonium; and certainly the faith and persistence with which these people have improved their own wildings is very remarkable, and I have sometimes thought that therein lies, by implication, the moral lesson to our British gardeners, "Go thou and do likewise." I am afraid, however, we are too fond of jumping to conclusions, too fond of rapid results, to take up the culture of our native Corn Marigold (*Chrysanthemum segetum*), or our

great Ox-eye Daisy (*Chrysanthemum leucanthemum*), with anything like the long-suffering faith that must have prompted and animated the Chinese gardeners who first began the culture of the wild *Chrysanthemum* centuries upon centuries ago. It is not only possible, but extremely probable, that the *Chrysanthemum* was a popular garden flower in China when Egypt was in its prime, and in the future it is likely to remain the national floral emblem of a people who will either, as friends, help us to keep our foothold in the East, or, as foes, they may possibly eat up the Russian Bear, and then reserve the Eastern half of the world's loaf for themselves.

We have now to consider the flower itself. I have reasons for believing that the small single yellow *Chrysanthemum indicum* (commonly cultivated in India, although only wild in Corea, China, and Japan) is the original wild type from which natural variation and culture have evolved all larger-growing and more highly coloured forms. All the botanists, from Linnæus and De Candolle to Messrs. Forbes and Hemsley (*Jour. Linn. Soc.*, vol. xxiii., p. 437-8), have considered *C. indicum* and *C. morifolium* (= *sinense*) as two distinct species. I only believe in one species—the so-called *C. indicum* (of which *C. morifolium* (*C. sinense*) is, as I take it, a mere geographical variety), since I find that nearly every batch of seedlings exhibits a tendency to revert to this, as the primitive yellow-flowered type, although all sorts and sizes, and conditions and colours, are obtainable from seeds gathered from the same capitule, be the seed-bearer pompon (*C. indicum*) or large-flowered (*C. morifolium-sinense*). When the weird forms, now known to have been of Japanese garden origin, were introduced by Mr. Fortune in 1862, we were very nearly led to believe in a third species (*C. japonicum*), so distinct and different were these flowers to those previously known in Britain. Even supposing that there originally were two wild species of *Chrysanthemum* in China or Corea (a view from which I dissent), the result, as above stated, would tend to show that they must have intercrossed freely with each other; but all my observations go to prove that the weedy little single yellow Pompons, which so often come from the seeds saved from the finest and most modern of the large-flowered kinds, really imply reversion to first principles (ativism), and not the unmixing of two distinct wild plants naturally or artificially cross-fertilised.

Botanically the Chrysanthemum is a glorified Ox-eye Daisy, trying hard to raise itself from a herbaceous perennial into an evergreen shrub. It belongs to the great natural family of the Daisy Flowers (*Compositæ*), and what we as gardeners call a "flower" or a "bloom" is really a flower-head or capitulum (*a*) made up of a hundred or more separate individual flowers, all neatly arranged into a bouquet-like group, and held in their places by a cup-shaped common calyx or involucre, as shown in this diagram (*b*). In fact, composite flowers are made up on



THE CHRYSANTHEMUM.

- a.* Diagram showing arrangement and analysis of flower-head, or capitulum.
- b.* Involucral bracts.
- c.* Hermaphrodite florets.
- d, d, d.* Female florets, or ray.
- e, e.* Disc of the capitulum.
- f, f, f.* Syngenesious anthers.
- g.* Bifurcate stigma.
- h.* Pollen grains.
- i.* Seeds.

what I may call the paint-brush principle, the florets representing the hair or bristles, and the involucre replaces the supports by which the hairs or component portions are held together, as here shown (*b*). The florets (*c* and *d*) are generally of two kinds, the outer or ray flowers being more or less ligulate (*d*), while the central or disc florets are tubular, as here shown (*c*). The outer or ray florets are female flowers having styles only, and no stamens, but the central or disc florets are hermaphrodite, being furnished with pollen-yielding anthers as well as with pollen-receiving bifid styles (*e*). The anthers (*f*) of the Chrysanthemum, as of all the members of the composite order, are coherent by their margins, or syngenesious, and they are, moreover, proterandrous—that is to say, the pollen is ripe and ready some days before the stigmas of the same flowers are fit for fertilisation. In a word, the Chrysanthemum had ages ago become naturally adapted for cross-fertilisation, and to that fact no doubt is due its variability in nature and in our gardens.

Our finest and best Japanese Chrysanthemums of to-day are raised by M. Délaux, Dr. Ed. Audiguier, M. D. Pertuzes, and other raisers of Toulouse; M. Reydellet of Valence, M. Boucharlet, aîné, and M. Rozain Boucharlet of Lyons, and Major Charles Le M. Carey of Guernsey; but the American growers, although much later in the field, are already sufficiently successful to become formidable rivals in the future.

ENGLAND AND IRELAND.—And now comes the question what shall we do in England? Shall we rest contented with the varieties our friends in France, the Channel Islands, and in America rear and send to us year after year, or shall we rear home-grown seed and seedlings for ourselves?

Chrysanthemum seeds were successfully harvested in England fifty or sixty years ago, and they are ripened here to-day by Mr. Alfred Salter, Mr. Cullingford, Mr. Teesdale, Mr. Piercy, and other growers. Mr. Hartland ripened seeds at Cork, cutting the flowers, which were pompons, as the seed approached maturity, after which the flowers were dried in a hot air press. Seeds thus ripened were given to Mr. Cullingford, who raised from them Hartland's "Marguerite," a small single-flowered white, and from this last-named variety Mr. Piercy has raised in the second generation several superior early-flowering kinds, including Miss P. Broughton, Clara, White Lady, Goldsmith, Dodo, and others.

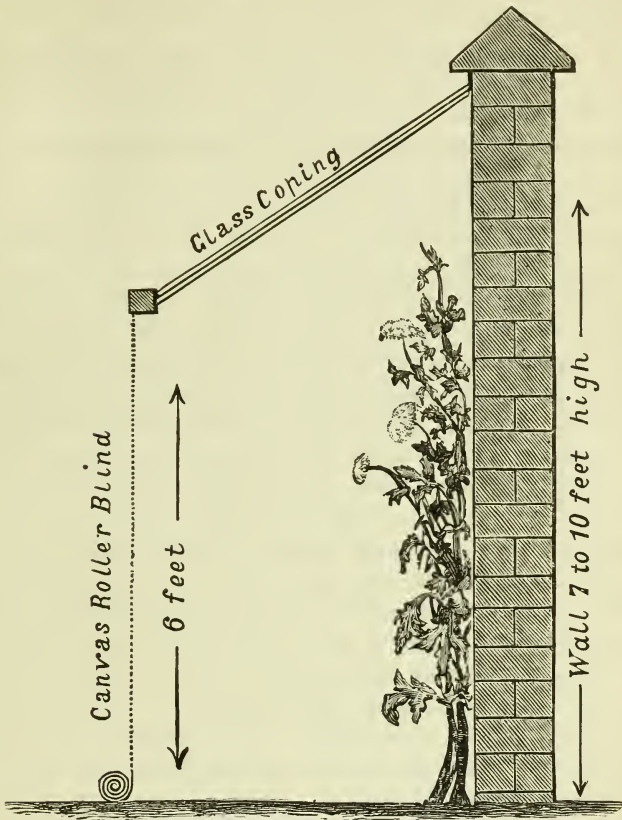
Jacintha was reared from home-saved seeds of Salter's Early Blush, the flies having no doubt carried pollen to its stigmas from other single or semi-double varieties. The best early yellow Pompon, viz., Golden Shah, originated from this seed, as also did the lovely white Duchess of Fife.

When we come to consider the harvesting of Chrysanthemum seed in the garden, we of course find that the question of nutrition is at the bottom of the whole thing.

Being, as we have said, naturally a sub-shrubby plant, the more woody it is the better it seeds. Our plan of cutting down the plants every winter, and growing on young plants from the succulent young growths in rich soil by the aid of stimulants, is quite opposed to the possibility of seeds being saved. All other things, such as heat and light, being equal, *rich soils* and much moisture or manurial stimulants conduce to the production of vegetative growth, and the development of the female floral organs, such as ray florets and styles. On the contrary, *poor soils* and drought are highly conducive to the growth of the andræcial whorl, or the anthers and their golden harvest of pollen, and also to the production of seed. Heat and drought = ♂ fls. Cold and moisture = ♀ or neuter flowers. Do we not see this result every year of our lives in the garden? After a hot dry summer and autumn (which, as the gardeners say, ripens the wood) we get good fruit and seed crops the succeeding year, but after a dull wet cold season we know the reverse is generally the rule. We must apply these broad and simple principles to the Chrysanthemum, and good seed will be attained in England quite as readily as large blooms.

But there must be no manurial stimulants, none of the syringing, and but little of the watering so necessary in the culture of large and showy flower-heads for decoration or exhibition. The Chrysanthemum seeds best as planted out in the open air in a high and dry position, and when the flowers show colour they should be protected by a glass coping, with a roller-blind of stout canvas to let down in front of the plants to protect them from rain and frost. The thin, late and shabby blooms seed best, and the greatest drawback to the seed ripening is wet, or even a damp atmosphere. As a rule, the large and early flowers of the Chrysanthemum are erect; but the later axillary flowers are drooping, and not so liable to suffer from

rain or dew and fogs as are the large full flowers. The whole secret in the harvesting of Chrysanthemum seed is to place the plants in a very dry, warm (55° F.), and airy atmosphere when in



bloom. Even in the dry and sunny winter climate of Guernsey, the first seed was obtained by a baker (Mr. Webb), who trained his seed-producing plants on a warm wall at the back of his oven, thus securing the two great essentials of warmth and dryness so necessary to seed and pollen production. Again, a good deal of patience is required, for the seeds swell and ripen slowly long after the florets have withered away. The decayed florets should be carefully cut away, or there is great danger of damp ruining the crop. As is shown later on, Mr. John Thorpe cuts off the

female florets before he fertilises or pollinises the stigmas. Very good keen eyesight, and some practical knowledge of what *Chrysanthemum* seed is really like when ripe, is also necessary, for there are numerous instances of good seed having been overlooked or thrown away by the unconscious grower. M. Reydellet, of Valence, was led to become a raiser of seedling *Chrysanthemums* by finding a self-sown seedling growing in one of his *Geranium* pots. On its flowering, it proved to be a distinct variety, a fact which led him to make further experiments; and to-day, as a raiser, he ranks second only to M. Délaux. I have here a small packet of *Chrysanthemum* seed, which anyone may inspect if they care to do so. This seed is very plump and good and clean; but as originally mixed up with dried bracts and the *débris* of the old flowers which produced it, one might easily pass it over unnoticed. So far, I believe, but little artificial cross-breeding has been resorted to by the raisers of *Chrysanthemum* seedlings. It has been done, but not so much as is desirable. Most old raisers seem to have trusted to insect aid, or to chance, in the matter. It is, however, quite easy to take the pollen from one flower on a dry and sunny day when it is ripe, and to apply it to the out-curling stigmas of another capitulum. A camel's-hair brush moistened in the honey of a *Fuchsia* flower is best for removing and applying the pollen. As a rule the incurved varieties are deficient in pollen, most of the florets being ♀ or ○, and to this fact is mainly due the extra difficulty in rearing these kinds. Late flowers from old and hard-grown plants sometimes contain a few disc florets from which pollen is procurable. All the single and Anemone-centred kinds seed freely; and so do the Japanese when grown naturally as above indicated.

At a meeting of the Floral Committee of this Society held on April 1, 1884, a very interesting specimen of *Berberis japonica* was exhibited. It appeared that the specimen, a flowering shoot, had been cut from and placed in a vessel of water, where it continued to expand its flowers for several weeks, and eventually ripened a number of berries which, when examined carefully, were found to contain perfect seeds. This was considered more remarkable seeing that this shrub, although flowering freely, rarely produces ripe seeds. Now comes the interesting part of the story. In connection with this fact Mr. Alfred Salter informed the Committee that nearly all the *Chrysanthemum* seed from

which he and his father, Mr. John Salter, raised the many varieties of Chrysanthemums for which they became famous *was ripened by them* on carefully crossed flower-heads *cut from the plants*, and placed in jars of water, where they often took three months to ripen their seed, but that in almost every instance they did ripen it perfectly and thoroughly, a circumstance which could not be depended on if the flower-heads were left on the plants, where they usually damped off without ripening any seeds. (W. E. G. in *Garden*, vol. v., p. 304.) I have written to Mr. Alfred Salter, who kindly replied corroborating in the main the facts as above given. "It is quite true," he writes, "that I ripened seed from gathered flowers at Versailles Nursery, Hammersmith, W. They were Japanese varieties, and it was done in the following manner. It had been a warm autumn, and some varieties had flowered early. The flower-heads of these were taken off with about six inches of stem attached, and were then placed in bottles of water on a shelf in a warm house, where they remained for nearly two months, and I was rewarded by a nice lot of plump seed, one of which produced the well-known James Salter."

It seems probable that the first seedlings were raised in England a year or two later than in France. Salter, at p. 9 of "The Chrysanthemum," tells us that "in 1830 seed was first saved in the South of France." Chevalier Bernet, of Toulouse, has generally been credited as having been the first raiser of seedling Chrysanthemums in Europe in (?) 1826; but if he really was the first in the field with *bonâ fide* seedlings, he must have been very closely followed by Mr. Isaac Wheeler, gardener at Magdalen Hall (now Hertford College), Oxford, who is also said to have reared seedlings from home-saved seed in 1830, or in the following year. Mr. Haworth tells us in his "New Arrangement of the Double-flowered Chrysanthemum," published in 1833, that Mr. Wheeler's seedlings were chiefly obtained from the Early Blush, the Early Crimson, and the Two-coloured Red, all originally imported from China. His eldest son, Mr. Rowland Wheeler, tells me that he was too young at the time to know anything of his father's process; but what he does remember is "the fact of his having *dried the various flowers* in order to procure the seed." I want you to notice this fact of the seed-bearing flowers having been dried—a point of importance to which I shall again return.

On December 2, 1832, Mr. Wheeler is said to have exhibited some of his seedlings in London before the Society, and it is recorded that he received a silver Banksian Medal for them as being the earliest seedling Chrysanthemums raised in England.

Mr. Wheeler's success was very soon followed by at least two Chrysanthemum growers in Norfolk, about the year 1835, when Mr. Short and Mr. Freestone reared some fine incurved kinds. Norfolk Hero, Nonpareil, and Prince of Wales (of Freestone, not of Davis!) were amongst the pioneers. This last-named variety was, as Mr. Alfred Salter informs me, a very remarkable two-coloured, or red and yellow flower, that would be highly esteemed to-day were it not lost to cultivation.

FRANCE.—In 1838 the late Mr. John Salter settled as a nurseryman at Versailles, and, finding the climate suitable, he imported many of the best kinds as then grown in England, and set himself about their further improvement. Seedlings began to be reared at Versailles in 1843, and, at a later date, others appeared at the Versailles Nursery at Hammersmith, W., and one of my pleasantest memories as a gardener is of a visit I made in 1868 to that classical ground, where I saw Mr. Salter himself, and heard him discourse on the best new Chrysanthemums of that year. Mr. Salter may fairly be called the "Father of the Chrysanthemum" in England, since he not only reared many fine varieties himself, but he bought up the finest and best of the seedlings of his time, as then reared by Webb, Smith, Clark, Davis, Pethers, and others in the Channel Islands, where the tradition still lingers that neither Mr. Salter nor Mr. Bird of Stoke Newington would look at any seedlings except incurved, or now and then a superior new pompon.

The following is a list of Chrysanthemums actually reared from seed by the late Mr. John Salter, or by his son, Mr. Alfred Salter, who is, happily, still spared to us as an enthusiastic amateur, and as a distinguished raiser of seedlings of our popular flower :

*Annie Salter (1844)
 *Alfred Salter (1856)
 Adrastus
 Andromeda
 Arthur Wortley
 Chang
 *Cloth of Gold (1850)
 Comet

Countess Granville
 Cossack (A. Salter)
 *Crimson King, or King of the
 Crimsons (1847)
 Daimio
 Diamant of Versailles
 Duchess of Edinburgh
 Emperor of China

Fleur de Marie (1846)	Marquis of Lorne (A. Salter)
Garnet	Meg Merrilies (1871)
Golden Hermione	Nancy de Sermet
*Golden Queen of England (1859)	Purple King
*James Salter (1869)	*Queen of England (1849)
Jane Salter	Queen of the Isles (1860)
Jenny Lind	Rex Rubrorum (A. Salter)
John Bunyan (1862)	Scarlet Gem (1857)
*John Salter (1866)	Snowball (1862)
Kæmpfer (A. Salter)	Tisiphone (single red), (A. Salter)
King of Anemones (1857)	*Venus (1855)
*Lady Talfourd (1867)	*Versailles Defiance (1852)
*Madame Poggi (1844)	

* Perhaps those marked with an asterisk are Mr. John Salter's best seedlings.

The way Mr. Salter managed his seed-bearing plants at Versailles was to plant the early kinds at the foot of a south wall, and in the autumn a coping of glass was placed just above the flowers to keep the blossoms dry. They were also protected in front by a blind or other shelter during severe frost. The seed takes a long time to mature, and was seldom ready for gathering before February or March. Seed-saving was found by Mr. Salter to be a more difficult matter in England, particularly with the incurved varieties, the rains and, worse still, the London fogs of November rendering it nearly impossible, so that one might almost be tempted to say that the seed gained was not worth the trouble. The only way found successful was to grow the plants quite naturally in pots (48's), and to flower them as early as possible, keeping the flowers *quite dry*, but in the open air, in a warm sheltered situation, until the flowers were quite over, after which they were placed in a warm greenhouse, with a free current of air passing through it, and the result was a little seed.

CHANNEL ISLANDS.—Mr. Charles Smith, of Guernsey, who has raised some of the very best of incurved varieties, tells me that he grew his seed-bearing plants, and saved the seed, in the open air, against sunny walls. One season he raised three thousand seedlings, out of which some sixty or so were sold to Mr. Salter and to Mr. Bird, of Stoke Newington. Mr. Smith says a warm, sheltered, high and dry garden are the necessary conditions for securing seeds, a result very difficult to attain in low, damp, and foggy localities.

One feature insisted on by Mr. Smith, who reared incurved and pompon varieties only, is that the seedlings from the same

seed-head yield flowers of all colours, and he feels convinced that many of the Guernsey seedlings of twenty or thirty years ago, and then discarded as not fulfilling the conditions required, would, if they existed now, be placed in the so-called Japanese section. In those days they failed to "fill the bill" of the florist's ideal, and were thrown away as "rags."

A very celebrated amateur cultivator in Guernsey, to whom I wrote concerning the rearing of seedlings, kindly replied as follows: "As to saving seeds, we always try to do so every season, but *in damp autumns* it is most difficult. We have no secrets about the subject, merely choosing the finest kinds and placing them near to each other so as to secure cross-fertilisation by means of the flies. We then *very carefully dry* the heads of seeds, sowing them as soon as ripe, and blooming them the same autumn. All our seed is now saved in a dry, warm, and airy greenhouse, but we have had a splendid harvest during dry seasons from plants outside on a wall covered by a glass coping and protected by a blind in wet cold weather."

Very few growers in Guernsey now save seeds as compared with those of twenty or thirty years ago, when incurved varieties or pompons only were all the rage. Major Carey's gardener (M. N. Priaulx), however, still harvests seeds, as I am told, under glass. Major Carey, to whom I wrote in 1885, very kindly gave me the following list of varieties, as raised by himself to that date:—

Beaumont	Ethel
Belle of Japan	Sarnia
Yokohama Orange	Bijou of Guernsey
Diamond	Peter the Great
Sir Isaac Brock	The Czar
Emperor Nicholas	Hackney Holmes
Red Gauntlet	Victoria
The Khedive	Mrs. Charles Carey

Another notable raiser in Guernsey is Mr. James Downton (gardener to Saumerez Carey, Esq., of The Grange), who will long be remembered as the raiser of that "snowy-breasted pearl," Elaine, and her scarcely less popular foster-sister, Fair Maid of Guernsey. As I have shown, James Salter was raised by Mr. Alfred Salter, from cut flower-heads in water, in 1869, and it is interesting to know that this variety bore the seed from which these twin varieties were raised. Mr. Downton, at my request, was good enough to tell me the history of the

birth of Elaine, and no words of mine could tell the story better.

“About seventeen or eighteen years ago,” says Mr. Downton, “I sent for a plant of James Salter, a new Japanese variety, to grow for conservatory decoration. I flowered it in a south house, and having given up raising seed I thought no more about it until one day my friend, Mr. C. Smith, the raiser of so many fine kinds, went into the house and noticed its dried and withered blooms, and set me looking at the seed-heads, when I noticed for the first time some seed. I sowed it the same spring, producing Fair Maid of Guernsey and Elaine. The plant of James Salter was the only Japanese variety in the house, all the rest being incurved and reflexed kinds. The Japanese varieties were very little thought of a few years previous, and I have known hundreds of single and half-double flowers consigned to the rubbish-heap, which were certainly superior by far to many of the kinds now common.”

PORTUGAL.—In Portugal, where, as Consul Crawford tells us, the Japanese varieties were introduced and grown long before they were imported to England, seed is produced with tolerable facility. An amateur Chrysanthemum grower in Oporto kindly tells me that James Salter, Fair Maid of Guernsey, and other so-called Japanese kinds, produce seed in his garden in the open air. He also corroborates what Mr. Forsyth, of Stoke Newington, told us long ago in the *Gardeners' Magazine* (April 20, 1872), viz.: that the earliest and finest of the flower-heads produce no seed, but that the poor and straggling pendulous flowers, which are borne on weak axillary branches at the end of the season, or in February or March, do so pretty plentifully if kept dry. In Oporto cross-fertilisation is effected by a small drone fly, and also by small beetles. In America, also, where Dr. H. P. Walcott and Mr. John Thorpe were the pioneers in saving seed, I am told that the flies are found to be useful in crossing the various seed-bearing varieties.

SOUTHERN FRANCE.—Of all modern seedling raisers the place of honour must perforce be accorded to M. Simon Délaux, of St. Martin du Touch, près Toulouse. In 1864 he first obtained some of the then new importations introduced by Mr. Fortune from Japan in 1862, and in 1866 he from these obtained his first crop of seed. During 1872 and 1873 he sold to M. Boucharlet several

distinct seedlings, such as Gloire de Toulouse, Miron, Ornament de la Nature, Soleil d'Or, Carnot, and Madame Délaux. No other raiser has been so successful, and, if he continues his labours of skilful cross-fertilisation and selection, one can scarcely predict the point where his triumphs may end. M. Délaux has kindly informed me that he grows his seed-bearing plants in pots in the open air, but removes them into the houses on the approach of damp weather in October, or into special structures wherein the flowers can be kept perfectly dry, and air admitted freely during fine weather. As will have been gathered by references throughout this paper, atmospheric drought is the essential factor in seed saving, and this is a point M. Délaux particularly emphasises in his letter to me.

A SELECTION OF THE CHRYSANTHEMUM SEEDLINGS RAISED BY
M. SIMON DÉLAUX.

Bouquet Fait	Madame John Laing
Fanny Bouchalet	„ Bertier Rendatler
Fernand Féral	M. Tarin
Flamme de Punch	Mr. W. Holmes
Hiver Fleuri	M. Garnier
Japonais	Dr. Macary
L'Île des Plaisirs	M. John Laing
Margot	L'Adorable
M. Astorg	Madame de Sevin

M. Délaux issues every year a descriptive catalogue (illustrated) of his new seedlings, which, together with his general Chrysanthemum catalogue, should be in the hands of all admirers of this flower. Beautiful and distinct as some of the Continental seedlings are, there can be no doubt that the selection of varieties might have been more rigid, seeing the weeding-out which purchasers in this country have had to do for themselves after paying high prices for delicate or worthless novelties. The new seedling varieties of the past two seasons were, generally speaking, below our average standards of to-day, and are not to be compared with the best English seedlings reared from Continental seed by Mr. Cannell (Avalanche), Mr. J. Laing (Stanstead White), or Mr. Stevens, a success that is most encouraging.

AMERICA.—In America the Chrysanthemum has been a favourite winter flower for the past eight or ten years, and Dr. H. P. Walcott began to rear seedlings about the year 1879, he

being very closely followed by Mr. John Thorpe, and the results are every year becoming more and more important. Mr. John Thorpe kindly informs me that, although single and half-double Japanese kinds seed spontaneously in some cases, the progeny is as a rule poor, and that the best of seed is only to be gained by careful pollenisation. "Before attempting to cross the flower-heads I always shear or clip off the florets nearly as low as the protruding styles, and then apply pollen to the stigmas. But few of these perfect seed, but the little obtainable under these conditions generally yields some good varieties. For seeding I generally grow the plants in six-inch pots, each plant bearing only two or three flower-heads."

Some varieties have been refined so much that when well grown they are sterile and yield no pollen, and such kinds must be starved back into fertility. Seeds from the best forms cross-fertilised with each other may be small in quantity, but the quality of the resultant seedlings is in inverse proportion, and from 50 per cent. to 100 per cent. of really good seedlings may be obtained. Mr. Wm. Falconer has also, at my request, given me the following account of the seeding and the seedlings of this flower in America :—

Chrysanthemums set seeds very freely in this country, and we have no trouble whatever in getting all the seed we want either with or without artificial pollenation. Indeed, on benches where Chrysanthemums have stood and ripened their crop of blooms we often have lots of little seedlings come up from seeds self-dropped from the plants. I grow a large number of Chrysanthemums out of doors altogether, and in long open Novembers, when the flowers open early and mature themselves, we, next spring, find lots of little seedlings come up around the old plants; but in cold, raw, wet Novembers seeds do not set well and seldom ripen on our outdoor plants.

Seed-saving is a little business of itself, and several florists find it as profitable to raise seed as sell the flowers. They plant out their plants in the open ground early in May, lift and pot them early in September, and bring them into a light greenhouse. Feeding the plants and thinning the flower-buds are well attended to. When the flowers begin to open, the house is kept cool and airy, and the atmosphere dry. This gains stocky plants, stiff stems, and perfect flowers. As the flowers open wide the petals are clipped off short with a shears. This gives a good chance to the generative organs to perfect themselves, and admits of natural aid, as flies or wind, to disseminate the pollen. But we don't wait for nature all the time; every fine

sunny forenoon we brush the flowers with a camel's-hair brush to spread the powder. Clipped flowers set far more seeds than do unclipped ones—that is in the case of full doubles; of course, in the case of singles, clipping makes very little difference. Clipped flowers don't damp off as do unclipped ones.

In saving Zinnia seed you may also observe the great value of clipping in the petals as a guard against damping off; also to permit air and insects to fertilise the flowers.

It's no use talking to us folk in America about imported Chrysanthemum seed. We don't believe in it. The American-saved article is in large demand and commands a big price, but imported seed is in bad odour.

The following list of the best American kinds is compiled by Mr. John Thorpe, who is the father of the Chrysanthemum in America.

LIST OF THE BEST CHRYSANTHEMUMS AS REARED FROM SEEDS
(MOSTLY HOME-MADE) IN THE UNITED STATES OF AMERICA.

Mrs. A. Carnegie	Mrs. Judge Benedict (finè anemone)
Mrs. W. K. Harris	Wm. Dewar
John Thorpe	Colossal
Mrs. L. Canning	Mrs. E. W. Clark
Mabel Douglas	Thorpe Junior (anemone)
Mrs. John Wanamaker	Puritan
Mrs. J. C. Price	Grace Attick (very early Japanese)
President Hyde	Sam. Henshaw
Coronet	Shasta
We-Wa	Robert Walcott

NOTE.—Mrs. Alpheus Hardy was introduced direct to New York from Japan, and is not a seedling raised in America, as some have supposed.

Very often when I have recommended the raising of Chrysanthemum seed I have been met with the reply, "Oh! it's no good: our climate is not suitable for that kind of work"; and it has not always mended matters when I have pointed out the fact that we have in England perhaps the finest and most varied area of glass-roofed climate in the world. Of course, I know that men worried by business and routine have not the time to devote to careful hybridising or cross-breeding and seed-saving; but is it too much to expect that some few amateurs in such a wealthy country as is ours should take to the saving and rearing of Chrysanthemum seeds, not for profit, but as a useful and pleasant hobby, having some of the exciting attractions of racing and of whist and chess combined? As a matter of fact, seeds have been saved in England over and over again, and I believe far more seeds have been thrown away unconsciously than have

been seen and preserved for sowing. I have saved seeds in Ireland from the golden pompon St. Michael as trained to a sunny wall, and have now and then found good seeds in the heads of Japanese varieties, which had ripened as they lay on the rubbish-heap after having been cut from the plants.

When once good seed is secured, the rest is easy. Sown in March in a gentle bottom heat of 65° to 70° F. it germinates as freely as Cress seed, and in a few weeks from sowing the plants are large enough for pricking out in boxes or pans. Their after-culture is similar to that of cuttings, and, as a rule, all the seedlings flower the same year in which they are sown, *i.e.*, in about eight or nine months from seed sowing.

The main good points raisers everywhere should strive to obtain may be grouped under the following heads:—

1. *Constitutional Vigour*.—That best of all hardy kinds, old Emperor of China, is the type of vigour and hardihood desirable in new seedling Chrysanthemums. Hardy outdoor kinds are most desirable.

2. *Habit*.—May vary, but dwarf and bushy habited kinds fulfil the desires of the majority of growers, and a dwarf free-flowering habit is a point worth striving for, even although by adopting the “cutting-down” and other cultural methods, we can render even the tallest kinds dwarfer than they naturally are.

3. *Quality and Size of Blooms*.—It ought to be more generally recognised that mere size is by no means an element in beauty. Blooms of 9 to 12 inches in diameter are now not very uncommon, and such blooms of good and refined quality are quite large enough. Some of the smallest of Roses and Chrysanthemums are the most exquisite after all.

4. *Shape or Form of Flower*.—This again may be as variable as size, and new forms are, of course, always to be welcomed, seeing that variety is proverbially charming. Incurved flowers, showing the backs of the florets, will never equal the reflexed or Japanese varieties in colour, as in these the face of the florets is shown. All forms are welcome. We want more quaint flowers of the Belle Paule, Fabian de Mediana, and Sœur Dorothée Souille type—the so-called Japanese Anemone-flowered race. In a word, let us emancipate ourselves from the dogma of the old globe and circle school, and take our feast of beauty as nature and art can best develop it to our hands. Beauty is not definable

by the compass or by the rule ; the artist, the amateur, and the decorator must be pleased, as well as the true and high-bred florist so-called. The best of all beauty is perfect fitness for a perfect use, and is not to be bounded by either circles or globes.

5. *Texture of the Florets*.—So far, as a rule, the florets of all *Chrysanthemums* have been smooth, but Mrs. Alpheus Hardy, one of the most remarkable varieties ever sent from Japan, and exhibited here to-day for the first time, opens up a vista of textural possibilities and potentialities undreamed of before its introduction to Europe. This variety, with Phœbus, a heavy yellow, ought to be welcomed by the seed-raiser as a new departure indeed. We must try for a new raise of *Chrysanthemums* having hairy or fringed florets—a result that is now foreshadowed and sure to come.

6. *Colour*.—Our present range of colour is not so vast as to preclude the hope of more variety. From yellow and white, through pink and rose tints to orange and red (very brilliant in Tokio), and crimsons of varying shades to purple, is at present the range. So far we have no blue *Chrysanthemum*, and, indeed, blue-flowered composites generally are rare. Our native Chicory plant is an exception to the rule. But twenty years ago nobody ever expected to see a blue Chinese *Primula*, and yet to-day it is very nearly obtained ; and I think our *Chrysanthemum* raisers should try for a seedling blue *Chrysanthemum*. They may not succeed for a generation or two, but it is a result sure to come sooner or later ; and although people now alive may never reach the end of the journey, what lovely varieties will crop up by the way !

7. *Perfume*.—Belonging as does the *Chrysanthemum* to that section of the composites (*Anthemidæ*) which includes the Yarrows, Camomiles, Tansy and Wormwoods, it is at once remarkable as being the most agreeably fragrant of them all. The *Chrysanthemum* flower is very often agreeably perfumed, and the single white varieties as a class are the sweetest. Nearly all the single-flowered kinds are more or less scented, and *Progne* and *Odorata* are quite remarkable as deliciously perfumed flowers, and a plant named St. Leonard in the Society's collection at Chiswick has also a Violet-like fragrance. The scent of the *Chrysanthemum* is said to be of that sweet and healthful character that has a good moral in it, and it is very different to

the luscious and demoralising sweetness of the Gardenia or the Tuberose. Even the leaves and young shoots of the Chrysanthemum are agreeably aromatic when pressed in the fingers. By carefully selecting the sweetest varieties and judicious cross-breeding much may be gained in this direction.

8. *Time of Flowering.*—This is important, as we want any quantity of good early-flowering kinds of the Madame Desgrange and Wm. Holmes types, as also vivid and free-blooming pompons like Golden Shah. Chrysanthemums that are sure to flower well during September, October, and November will add a wealth of colour to our parks and gardens everywhere. I shall say no more on this head because our friend Mr. Piercy has made this branch of the subject peculiarly his own, and is waiting to tell you about them.

As to very late kinds, so far they have not proved so useful. Meg Merrilies, Fleur de Marie, and the old Grandiflorum often flower well into January, as do Roseum superbum and other varieties after being cut down early in June. Late blooms are easily obtained by well-known cultural means of retarding the growth and buds, but the early-blooming kinds must have precocity inbred in them, and there are enormous potentialities in this way yet to be developed.

Even the best of raisers in France, in England, in America, anywhere in the whole world, so far as we at present know, have never yet equalled the natives of Japan in their culture of this flower from seed. The names of three or four Japanese seedlings occur to me that are unique in their way, viz., Comte de Germiny, Edwin Molyneux, Mrs. Alpheus Hardy, Thunberg, and some few others, and, from these and other known results, Japan seems worth ransacking for varieties from one end to the other. We may not find the "true blue" variety, but we should at least be able to gather many new and beautiful forms in their native land, and we might also establish a trade in the best and choicest of Chrysanthemum seed with the natives of that interesting country.

Nomenclature.—Not only should the final selection of seedlings be a rigid one, but their names should be as short and euphonious as possible, and should in all cases be authenticated by the name of the raiser. As things are, much time and labour is wasted in writing long names, and as several popular names

are represented by two or more different varieties, the result is often a matter of annoyance and confusion.

SUMMARY.

From the foregoing information it appears that the early or summer-flowering Chrysanthemums produce seed more freely than the late kinds, but that all kinds produce seeds from the latest or starved blooms in a warm, dry, and airy atmosphere. Single-flowered kinds seed most plentifully, and are also as a rule more fragrant than the double kinds, while the incurved varieties produce seed most sparingly of all the sections, because deficient in pollen. The fact of good seed having been ripened on flower-heads cut from the plants and preserved in vessels of water in a dry, warm, and airy greenhouse is very interesting, and would be a method worth resorting to during damp and foggy seasons. I am also perfectly convinced that if half the keen observation and ability displayed by the growers of large show blooms was devoted to the practice of careful cross-breeding and seed-production, we should soon equal any raisers in the world in the production of new varieties. Even in Portugal and Spain, and in the warm Southern States of America, where the Chrysanthemum seeds spontaneously, there are many other climatic drawbacks that neutralise success. Incurved varieties, for example, cannot be grown in America, where a *Peronospora* attacks their leaves and kills them off, and in Southern France the climate also spoils them.

After all, no natural climate in the world can equal, all things considered, our glass-house climate in many parts of England, where the plants are absolutely under our control. I am sure we are all free-traders, inasmuch as we gladly take the best seedlings from America or France, or whencesoever they may chance to come, but at the same time I think we should also do our own best to originate more Chrysanthemums than we now do. I believe it is a well-proved axiom that the plants best suited to our gardens are the plants we raise from seeds grown and sown under the climatic conditions in which they have to live and thrive. People used to say we could not grow seedling Roses in England, but it has been done, and our English seedling Roses are equal to those of any other land. We must not blame our climate as an excuse for our own shortcomings, and I will go

so far as to say that any plants which cannot be reared from seeds in English gardens equal to the varieties from other countries are in the main unworthy of our culture.

In conclusion, I hope most sincerely that some amateurs, with time and a love for this flower, will take up this phase of Chrysanthemum culture as a speciality; and, if they exhibit some varieties with novel features or extra good qualities before this Society, I feel sure that they will be rewarded as was Mr. Wheeler half a century ago.

APPENDIX.

Dates and Authorities in reference to the Chrysanthemum.

1688. Breynius, Jakob (b. 1637, d. 1697), (? as cultivated in Holland 1688-9).
1690. Van Rheede, tot Draakestein, Hortus Malabaricus (1678-1703), t. 44, vol. x.
1712. Kæmpfer, Amoenitates Exoticæ.
1750. Rumphius, Herbarium Amboinense (1741-55), t. 1, vol. v.
1753. Linnæus, Species Plantarum (*C. sinense*, white flowers, large, and *C. indicum*, single white, and double small yellow), rep. by Willd. 1764.
1764. Chelsea Bot. Gard., introd. 1754 and flowered previous to 1764. See Royal Society's specimen (= Miller's specimens, No. 2,112, in British Museum).
1784. Thunberg, Flora Japonica (as *Matricaria*).
1789. Introduced into France by Ramatuelle, and cultivated by M. Cels, then a celebrated nursery gardener of Paris, who in 1790 sent the "Old Purple" (*Bot. Mag.* t. 327) to Kew.
1790. Loureiro, Flora Cochinchinensis.
1790. Introduced into England by M. Cels from France, and first flowered in Colvill's Nursery, King's Road, Chelsea, in 1795.
1792. Ramatuelle (as *C. morifolium*), Jour. d'Hist. Nat. vol. ii. (Paris). See Hemsley, *ante*, p. 111.
1794. Moench, Method. Pl. 1794. Suppl. 1802.
1796. Curtis, *Bot. Mag.* t. 327. (The first large-flowered Chrysanthemum bloomed in England. The variety was called the "Old Purple," and closely resembles the more modern variety known as "Dr. Sharpe" to-day.)
1797. Willdenow, Species Plantarum (1797-1810).

1802. First "sports" appeared in England. The first was also the first white Chrysanthemum in English gardens, and called "The Changeable White," or "Tasselled White." It was a "sport" from the "Old or Tasselled Purple" as first introduced, and resembled it in all points save colour. (Haworth.) First "sport" white from "Old Purple," and a pale pink "sport" from the "Changeable Buff."
1809. Desfontaines, *Hist. des arbres*, etc., vol. i. p. 316.
1813. Aiton, *Hortus Kewiensis*, ed. 2, vol. v.
1821. Wells, *First Essay on Cult.*, *Trans. R.H.S.* vol. iv. p. 572. Redleaf, near Tunbridge, Dec. 2, 1821. (This essay struck the keynote of all subsequent culture.)
- 1823-4. *Chrysanthemum involutum*. First "incurved" var. Sweet's *Brit. Fl. Gard.* vol. i.
- 1824-6. Sabine, *Hort. Trans.* 1821-1826, p. 326, etc.; 1824, vol. vi. p. 412; 1826, p. 322. (Twenty-seven introduced varieties from China, including "sports" appearing in English gardens, were cultivated at Chiswick up to 1824.) (Sabine.)
1825. First Chrysanthemum exhibition at Chiswick (700 pots).
1826. First French seedlings by M. Bernet.
1830. First English seedlings by Mr. Wheeler, for which a Banksian Medal was awarded by the Royal Horticultural Society, December 4, 1832. First Chrysanthemum show held at Norwich.
1832. Forty-nine varieties of Chrysanthemums grown at Chiswick for the Royal Horticultural Society. First arrangement of varieties into sections suggested by Mr. Douglas Munro, F.L.S., and published in *Hort. Trans.* vol. i. (2nd series).
1833. Haworth, *Loudon's Gard. Mag.* vol. ix. p. 218, rep. Jan. 1833. (The first good classification, etc., and mention of the first English seedlings, "sports," etc.).
1845. Small-flowered or Pompon Chrysanthemum introduced by Mr. Fortune, viz. "Chusan Daisy" and Chinese "minimum."
1846. First competitive Chrysanthemum show for *cut blooms* held in England, at Stoke Newington.
1862. Japanese Chrysanthemums introduced by Mr. Fortune (seven varieties).
1865. Salter, "The Chrysanthemum."
- 1884-5. Burbidge, "The Chrysanthemum - its History and Culture."

1888. Forbes and Hemsley, Jour. Linn. Soc. vol. xxiii. p. 437, and p. 438-9, Synonymy and Distribution in a Wild State.
1889. Hemsley, W. Botting, *Gardeners' Chronicle*, third series, vol. vi. History, amended Synonymy, and Distribution. The Synonymy is repeated in this volume, *ante*, p. 111.

DISCUSSION.

Mr. W. B. HEMSLEY drew attention to a selection of dried specimens of wild and cultivated Chrysanthemums from the Kew Herbarium, exhibited by the Director of the Royal Gardens, Kew, and observed that Mr. Burbidge had said that all the races of cultivated Chrysanthemums had descended from one wild species, namely, *C. indicum*. The botanical idea of species was somewhat different from that of horticulturists, but botanists endeavoured to make useful limits. He was not prepared to say that Mr. Burbidge was wrong in his opinion, but would point out the characteristics of the wild forms believed to be concerned in the parentage of the cultivated races. *Chrysanthemum indicum* in the wild state was usually a plant of moderate stature, with relatively thin, much cut leaves, and numerous small wholly yellow flower-heads. It ranged from Peking to Hong Kong, and in the southern part of the area the flower-heads were larger and less numerous. Possibly some of these specimens might have been cultivated, hence their greater luxuriance. Double-flowered *C. indicum* was cultivated throughout India, as well as in China, and was, he believed, invariably yellow.

Mr. MAXIMOWICZ, who had travelled widely in China and Japan, was of opinion that the cultivated Chrysanthemums had descended, variously blended, from two distinct wild species, namely, *C. indicum*, and another from North China and Japan, which he (Maximowicz) regarded as *C. sinense (morifolium)*. This was a very slender plant, with small, almost or quite glabrous leaves and moderate-sized flower-heads, with a yellow disc and bright rose-coloured ray. Mr. Hemsley, however, did not consider it probable that this form, which he had named *C. morifolium*, var. *gracile*, had been directly concerned in the parentage of cultivated Chrysanthemums, and pointed out specimens of a very different plant, recently collected in Central China by Dr. A. Henry. This was a very robust plant, with

thick, leathery leaves, very variable in shape and degree of cutting, and densely clothed with a white tomentum on the under surface. The flower-heads were large, with thick woolly bracts, a yellow disc, and a white ray. A similar plant, with very rounded lobes to the leaves, had long previously been collected in the Loo-Choo Islands. These plants Mr. Hemsley regarded as typical *C. morifolium* (*sinense*), and their almost exact counterparts in foliage and involucre bracts were pointed out in the double-flowered varieties exhibited. The three wild forms exhibited could not, with practical utility, be united as varieties of one species. In botanical matters they could not fix varieties in the same way that florists did. They had to deal with the wild material, and name it in the most convenient way they could—usually from dried specimens; and he was convinced that to throw these three forms together would not make what he had called a useful or intelligible species.

DWARFING AND GROUPING CHRYSANTHEMUMS.

By Mr. C. ORCHARD.

IN advocating the practice of cutting down, thereby dwarfing the Chrysanthemum plant, I am encouraged by the many excellent examples that it has been my pleasure to see in various parts of the country this season. Compared with what was generally seen a few years ago, these show a marked improvement in the strength of the plant and the substance of the flower; and I doubt not that many more will eventually be induced to try the system, to obtain suitable plants for conservatory and other home decorations, or for competitive groups at exhibitions.

There has been much diversity of opinion amongst growers as to the merits or demerits of the cutting-down system as compared with the right-away or natural system, but I must again say there is but little analogy between the two; and in advocating the cutting-down system, I have never contended that it should supersede the orthodox way of growing the large exhibition blooms that have been produced by the natural system of our leading exhibitors; but I do contend that many of the plants that produce these large blooms are very unsightly, and that dwarf plants with good healthy dark-green foliage can be grown

to produce flowers of large size and substance, without coarseness, in their true character and colour, and that such plants are more ornamental and have much to recommend them. There is an advantage in their not requiring the same amount of staking and supporting through the summer months, neither do they require so much head-room when housed in the autumn. They can be flowered in a low-pitched vinery or peach-house, or on the stage of a greenhouse, previously to being arranged in the conservatory if required. There is also this advantage, which to the professional gardener, who cultivates a large collection of Chrysanthemums, is important: there is a fortnight's relief after the plants have been cut down, when they require but very little attention. The potting-up being delayed for that period, more time can be given to bedding-out, grape-thinning, or the thousand and one things which claim the gardener's attention at a very busy time of the year. I can understand cultivators keeping aloof from the system at first. It is totally opposed to the orthodox way of growing the plant, and it would appear a grievous sacrifice of a fine stock of plants to cut them to the ground at a time when they seem to be repaying you for your attention during the spring. I must say, if we had had more varieties of the type and habit of *Avalanche*, *Mrs. Falconer Jameson*, and *Monsieur Freeman*, the system would not have been so forced on me, but exhibitors generally will encourage any variety that produces large flowers, no matter how tall and ugly the habit of the plant may be.

Details of striking the cuttings, potting-up, air-giving, soils and manures, are purposely avoided in this paper. Much has been written on the subject, and, although it is very important that these details should be attended to, success depends much more on the close attention given to plants from day to day. Many young beginners imagine that if they could only find out the proper soil or the proper manure, or if they only had the conveniences their neighbours have, their success would be assured. But it is not so. A few days' neglect will undo the work of a whole season, no matter how closely the other details have been adhered to; so I would impress upon my hearers the importance of doing what appears to them to be the proper thing at the proper time, and make a note of the same, but yet not to expect that they will command complete success the first season,

for it is by experience that we gain practical knowledge. Although I avoid the details alluded to, cultivation must come in, for after all the dwarfing system is but another phase in the cultivation which shows the adaptability of the plant to all circumstances. To achieve the greatest success it is absolutely necessary to have a good start with strong healthy cuttings, struck in single pots, and repotted on in the usual manner into 4-inch or 6-inch pots. By the month of May these should be standing out of doors in an open position, either on boards, tiles, or a good bed of cinder ashes, with plenty of room between them—strong, sturdy plants, with their pots full of roots. While in small pots, whether before the first or second shift, or as soon as the roots have reached the sides of the pots, they should be watered at every watering with weak liquid manure; some of the grossest feeders will require it twice on some days. The pots being full of roots, the wood becomes solidified, and the liquid manure keeps them strong and robust, giving plenty of root action, which constitutes the driving-power that is necessary to produce the new wood and foliage, and subsequently the flower-bud, in the three months that follow after having been cut down. Water should not be withheld for any length of time either before or after the cutting down; if kept dry the root action would be too much checked. One day is sufficient before the operation, and they may be sprinkled or syringed the day after, and so on every day until they break, when they will require more water.

Before cutting down one must have the object in view for which he is aiming; be it for conservatory grouping, the height of the background from which he intends to form the group should be considered, and some left taller accordingly; if for competitive grouping at exhibitions, the number of dwarf plants required for the front, and the medium height and taller plants for the body of the group, must be taken into consideration. But let me observe that, if the whole collection were cut right down, there is such a diversity in their habits that with the one break you would get plants ranging from 1 foot 6 inches to 6 feet in height. But if this were put into practice, it would bring the sections and varieties too close together in the group, which is neither desirable or necessary.

From the 1st to the 14th of June is my time for cutting down.

The plants should then be in the following stages of growth: the earliest varieties, such as Mr. Bunn, Beverley, Prince Alfred, and Lord Wolseley, will have made their first natural break, ranging in length from 3 inches to 9 inches. The Queens and other medium varieties, and also the later ones, such as Boule d'Or, Grandiflorum, Golden Dragon, Meg Merrilies, Princess Teck, and others of that type, will be in various stages ranging from 1-inch to 6-inch breaks. I commence about the 1st of June with Boule d'Or, Golden Dragon, Meg Merrilies, Pelican, Princess Teck, and other late varieties, to cut them down to within 2 inches, 4 inches, or 9 inches from the pot, leaving the foliage on them. For the convenience of watering, I place them together as they are cut down. At the interval of two or three days I cut down another batch, and so on periodically, finishing with the earliest varieties. With careful attention to syringing and watering, they soon break into strong shoots, mostly from the stem, but sometimes throwing up strongly from the base. When the shoots are from 1 inch to 2 inches long, I thin out the weakest, leaving three, four, or five of the strongest. After a few days, when the young breaks are from 3 to 6 inches long, they should be repotted into their flowering pots. I find 7-inch or 9-inch pots the most convenient sizes for grouping, and, by judicious feeding, good plants and blooms can be grown in the sizes mentioned. A few of the back-row plants may, however, be put into 10-inch pots. I would just say a good rich loamy soil should be used, but I prefer unfermented leaf-mould from the woods, if procurable, to half-decayed animal manure, as is sometimes used. Bone-dust or horn-shavings should be mixed with the soil, and half-inch bones used for drainage. They should be potted firm, leaving room for a top-dressing of a fertilising manure and a little fine soil at housing time. After repotting they should be stood out again in an open position with plenty of light between them, pinching out all surplus laterals or offshoots as they make their appearance.

The flower-buds should be showing on the points of these breaks from the first to the third week in August. All side-shoots should be removed and the centre flower-bud only left; if any should be subsequently found blind, I remove the shoot altogether, to throw the strength into the other flowers.

One of the most important things to be considered in group-

ing is one that is often done in a slipshod way—I allude to the system of staking and supporting the plants and flowers. Sometimes large white deal sticks are used, or heavy painted ones, tied close up to the base of the flowers. Such stiff and clumsy supports are most objectionable, and oft-times the sticks show more prominently than the flowers. The best for the purpose are small hazel shoots commonly called chisel rods; failing these, the shoots of the brown willow that are used for basket-making are the best for the dwarfest plants; these run different sizes, and it is best to select a stick of about the substance of the shoot to be supported, using one stick to each shoot, and framing the plant into shape whilst proceeding, *i.e.* if the plant has three shoots I should triangle them, if four I should place them in a square or diamond shape, making the shortest side the front of the plant. And it is very important, whether the plant be standing out of doors or under glass, to always keep the shortest side of the plant facing the light, so that the foliage should grow and keep that way, making a face to the plant; this is especially important for the dwarfest of the plants, that would be required for the front row or facing to the group.

After the plants are housed and the blooms begin to show colour, it is necessary then to give support to the flowers. I use galvanised wire supports to each of the blooms. By that time the plant will have made its full growth, and the wire-support can be fixed into position, *i.e.*, the stick shortened back to below the foliage and the wire tied firmly to it. I adopted wire on account of its neatness and pliability, for sometimes a bloom is stubborn and will turn the reverse way; the wire then can be bent to face the flower in any position. Nos. 14, 15, and 16 gauges are the proper sizes necessary; No. 14, being the stoutest, would be required for the heaviest blooms, and No. 16 for the smallest. They are twisted with a hook or a circle at the top. The crutch should be pressed up underneath the flower-head, and tied firmly close up to the top, and in about two or three other places. The circle should be used for the largest flowers, and the hook for the smallest; they give a great support to the flowers in travelling to the place of exhibition, and for grouping generally add a light and natural freedom to the plant, in contrast to the stiff and heavy stakes tied close up to the flower.

GROUPING.

In competitive groups at exhibitions there should be dwarfness without being too squatty, *i.e.*, the plants should be arranged with a gentle slope, so that each flower stands out separately to meet the eye of the spectator, and sticks and ties should have to be searched for to be seen. The arrangement of colours should harmonise, and be evenly balanced; the foliage should be of a dark and healthy green to form a good groundwork to the flowers, that on the front plants coming down to the pots. The front row should all be stood on the ground or floor; if elevated on pots or blocks it spoils the finish and contour of the group; the usual size, and one that suits the general body of exhibitors, is an arrangement in a space of 40 square feet, made in the shape of a capital letter D. This takes from 90 to 100 plants to fill, a sufficient number to give variety to the arrangement, and for placing in position in the time usually allowed on the morning of the exhibition. The best effect would be gained by having the back rows about 6 feet in height, sloping down to 1 foot 9 or 2 feet in front. The group should also slope a little towards the sides. I usually place my back plants in position first, using a few stouter stakes to give firmness and support, in case any of the others should require lacing back to them. I use fine bouquet wire instead of bass for lacing any flower in position, if required. It is best to put down the two or three front plants first on the line, and also one or two down the centre as guide plants to work to. By experience and practice one can tell pretty well the position of each plant, which should be selected and placed in position, if possible, at home before leaving for the exhibition. It is essential for the exhibitor to know the exact shape of the arrangement before leaving home, for some shapes require more front row plants than others. Therefore it would be well if all framers of schedules or superintendents of exhibitions would give the shape of the group as well as the superficial size, and adhere to it, for it is provoking to an exhibitor to prepare for a half-circle and then find that he is pressed into an oblong to make room for other exhibits, and then not having sufficient plants to finish off with. There should be an equal mixture of incurved and Japanese used, including a few large Anemones of both sections; but Pompons should not be used if possible—they give a weakness to small groups.

Some of the best and dwarfest varieties to grow for the front plants are Maggie Mitchell, Fleur Parfait, Mawet Postula, Mons. Freeman, Val d'Andorre, Triomphe du Nord, Chevalier Domage, Criterion, Mme. de Sevin, Mlle. Lacroix, Avalanche, Mrs. F. Jameson, Barbara, Princess Beatrice, Hero of Stoke Newington, Princess Teck, and others. In the case of larger groups, of course a greater number of the same variety could be used without causing a sameness; but large bushy heads of any one kind introduced neither adds to the merits or the attraction of a group. The colours and sections should be arranged evenly, without too much formality; the flowers should be of good quality, and not too crowded, but, on the other hand, full enough to give solidity to the arrangement; there should be a natural freedom about it that would contrast most favourably with a stiff and formal arrangement. I never use more than three or four of one variety in a small group. The charm and attraction is the variety it contains, and the searching out of them, if they be of good quality and true to character, is a great pleasure to visitors at an exhibition. In arranging flowers at home one must be guided entirely by the construction of the house and other circumstances. Most tasteful arrangements can be made in a greenhouse or vinery provided with shelves along the front or back of the house by first taking the stakes out of the plants and standing the pots on the shelves, and tying or suspending them to the wires and allowing the flowers to hang over. By judiciously arranging a tall and short plant alternately, a perfect bower of Chrysanthemums can be formed, although it does not look so natural; the incurved variety looks and keeps well in this manner. In conservatories where Camellias are planted out, the plants could be stood amongst them, the foliage of the Camellias forming a good groundwork to the flowers of the Chrysanthemums, which has a very pretty effect. I need scarcely say that tall, naturally grown plants are the best adapted for either of these arrangements. Where space will admit in a conservatory, I prefer a good large bold group arranged on the floor; it has a more imposing effect, and in greater contrast to the mixed groups of the usual summer occupants of the conservatory. Palms or other foliage plants can be used for the background, and some of the tallest should be arranged loosely and freely at the back; but, for the bulk, it

quite pays to wire and stake the flowers as recommended for exhibition grouping. Pots of *Selaginella denticulata* and Maiden-hair Fern should be grown and placed in front of the groups to hide the pots and give a finish to the whole arrangement.

DISCUSSION.

Mr. HIBBERD asked what difference in the time of flowering was caused by the practice of cutting down?

Mr. ORCHARD replied that the flowering was delayed about a fortnight, and one great advantage of the system was, that you could, so to speak, handicap the naturally earlier blooming plants by cutting down the late bloomers first, and the early ones last, and thus bring them all into bloom at the same time.

GROWING CHRYSANTHEMUMS FOR PROFIT.

By Mr. CHARLES PEARSON, F.R.H.S.

IN treating of the Chrysanthemum from the commercial or money-making point of view, the subject divides itself naturally under two headings, viz., "pot plants" and "cut flowers." I propose to give the second heading the preference, as being much the more important, for while the Chrysanthemum is but indifferently adapted to decorative purposes as a pot plant, it lends itself readily to almost every purpose for which cut flowers are used—the flowers having a wide range of colour, lasting well, and looking well under artificial light; in addition to which they make their appearance in the dreariest season of the year, when other flowers are chiefly conspicuous by their absence. The first point to be observed is to make a selection of varieties which will give you an unbroken succession of bloom through the Chrysanthemum season, and these varieties must be of such colours and form as will suit the popular taste.

The Chrysanthemum season proper may be said to last from the end of September to the middle of January, and though three or four months may be added to this period by means of summer bloomers, and by artificially retarding some of the later kinds, I think the attempt is rather to be deprecated than encouraged, as if the public be surfeited with Chrysanthemums

in season and out of season they will soon begin to tire of and dub them common, after which their decline will be rapid.

As regards colour, of course white is by far the most important, after which the most distinct shades of red, crimson, and yellow should be chosen, not forgetting to include a fair proportion of golden bronze, as this shade is very popular and appears likely to continue so for some time ; avoid carefully all shades of pink, purple, and mauve, as the fair sex now almost universally holds these in abomination. In respect to form, the more graceful varieties of the Japanese type are by far the most saleable, as most of the best florists now refuse to touch any of the buttony type of flowers and the heaviest of both Japanese and incurved, though there is still a fair demand for nice blooms of the Rundle family.

Perhaps the most important question in growing for cut flowers is whether it is more profitable to go in for quantity or quality, the answer, I think, depending entirely upon the market to be supplied. The finest blooms can, of course, only be produced by rigid disbudding, and it is only in London and one or two of our largest cities where sufficiently high prices can be obtained to reimburse the grower for this. Where, however, the demand exists it pays to cater for it, as the market is never glutted with really first-class stuff, while, as everyone who has had any experience as a salesman knows, there is often such a plethora of inferior blooms that their disposal at anything like the cost of production is an impossibility.

On the whole, the best-paying blooms are those grown on fairly bushy plants which have been stopped once or twice and then disbudded to the terminal buds. In speaking above of high-class flowers it must not be supposed that such blooms as would take first prize at a good show are meant (a writer in a leading horticultural paper last season estimates the cost of producing these at five shillings each), but blooms above the average in size and sufficiently well developed to thoroughly bring out the characteristic points of the variety.

It should be mentioned here that a few varieties should never be disbudded at all ; these consist of kinds such as *Roi des Précoces* and *Source d'Or*, which bloom in clusters, opening all their flowers well together, and are very little increased in size by the process of thinning.

While discussing quantity and quality, the rough-and-ready method practised by many of the market men of planting out Chrysanthemums during the summer should be considered. By planting out in May, and lifting before the autumn frosts, a great saving of labour in potting and watering is effected, and this through the hottest months, when the pressure of work in the nursery is the greatest; on the other hand, it must be remembered that the labour of housing plants that have to be lifted is much greater than if they were in pots; also, in the case of sudden frost, they cannot be laid down and covered as pot plants can, and, what is much more important, the plants always receive a check in transplanting, however carefully it may be effected, and the flowers are in consequence never of really good quality. The planting-out system can, I think, only be recommended where labour is very dear, and the market for cheap better than for high-class flowers. I have myself given it up in favour of growing three plants in a 12-inch pot, which, by stopping once or twice in spring, form great bushes, producing large quantities of flowers of good average quality. Such large pots are rather unusual, most growers preferring single plants in 7- and 8-inch pots; these, however, require looking over for water three times daily in hot weather, while the large ones do with once or twice—a difference worth serious consideration.

In enumerating the most profitable varieties, I will commence with half a dozen of the summer bloomers, though I do not recommend anyone to go in for them heavily, except in the neighbourhood of our largest cities, where there is generally a certain demand for any attractive flower which will last well, as they flower when both private gardens and the markets are full of Dahlias, Asters, Roses, &c., in addition to which many of the best buyers are away at holiday resorts. These are—Flora, bright yellow, good shape, an improvement on *Précocité*, which often produces a large percentage of one-sided blooms; Piercy's Seedling, golden bronze, very free; Jardin des Plantes, white; L'Ami Couderchet, pale primrose, a beautiful shade of colour; Mignon, golden yellow, very dwarf, a model summer-flowering kind; Lyon, rosy purple.

To succeed the above, Mme. Desgrange, and its beautiful sports Wermig, Burrell, and Mrs. Hawkins, should be grown

in quantity, the most economical way of doing so being to plant them out in good soil in beds 10 or 12 feet wide, where they will only require keeping free from weeds and an occasional soak of water through the summer, with attention to earwigs, when the buds show, if numerous. As soon as the buds show colour put up a rough framework of light scantling over them, so that two frame-lights will just reach over the bed; this will keep the flowers clean, and, with a few mats round the sides, will form ample protection against any frost which may be expected before the bloom is cut. The value of a crop of Desgranges varies considerably with the seasons, being sometimes rather a drug in the market, but, when an early frost clears off all tender flowers before the harvest festivals begin, it pays better than the later kinds.

For cutting from October to January I have chosen eighteen varieties, an apparently small selection when we hear of collections of five or six hundred kinds, but one hundred, I think, will be found to pay better than a more extended list; indeed, some of the largest growers restrict themselves to even a more limited number.

For the beginning of October, *La Vierge* and *Mrs. Cullingford*, both good whites, though a little stiff in shape; after them comes *Roi des Précoces*, dark crimson, one of the best cut-flower kinds in existence, the colour, form, and habit being all excellent—the fact that one firm has this year grown 20,000 plants for cutting being not a bad testimonial to its merits.

A good companion to the above will, I think, be found in *Capucine*, when better known, as it is similar in habit, but a bright golden amber in colour. This variety was put in commerce by *Boucharlet* last year, and received an award of merit from the Royal Horticultural Society.

The next two varieties on my list, *Lady Selborne* and *Mlle. Lacroix*, both white, are valuable as filling a gap in the succession, but are neither of them perfect, the colour not being absolutely pure; and, as neither of them last long in perfection, they must be marketed as soon as fully open. Flowering about the same time as the pair above mentioned is *William Holmes*, so bright in colour as to raise hopes that it is the forerunner of a real scarlet in the near future, and so well known as a splendid all-round sort that it is superfluous to more than

mention its name. Our next, Elaine, is perhaps as near perfection as we can hope to get, especially in purity of colour, nearly all other whites looking yellow beside it, and, if it could be had earlier in the season, I think Lady Selborne and Lacroix would disappear from the market. I have tried to get it early by early striking, and taking the crown buds, but after several trials have given up the attempt, as though the plants promised splendidly, the blooms came very rough and quite out of character, indeed hardly recognisable. A useful late crop of Elaines may often be had from early plants which have grown exhibition blooms, as, if the stems are strong and well ripened, they will, after being headed and placed in a light house, break and bloom all the way down. Of course the flowers will be small, but they come at a time when anything pure white is acceptable.

Source d'Or, golden bronze and orange, is one of the most beautiful Chrysanthemums existing, and always sells well in a cut state. As remarked before, it should always be flowered naturally in clusters, as it is much more beautiful in this form, while the flowers are scarcely increased in size by disbudding. A newer kind, Charles Delmar, in somewhat similar colour, but more ruddy, will be found valuable for succession, being free and of very good habit. The last of the mid-season kinds I shall mention is Cullingfordii, invaluable for its colour, a grand rich crimson.

The first of the late kinds is Fair Maid of Guernsey, a grand old favourite. The flowers, though somewhat loose in form, are very pure, and work well into all kinds of wreaths and other funereal arrangements. It should be carefully noted that the "Fair Maid" is very susceptible to injury from frost, three or four degrees sufficing to spoil every bud. It should not, therefore, be left outside too long in the hope of retarding it, or the whole crop may be lost. Another late white, Fleur de Marie, a very pretty Anemone-flowered kind, is a favourite with some of the growers for Covent Garden, but has never been profitable with me. It is a delicate grower, and unless well done many of its flowers are defective; at its best it produces but a scanty crop of blooms, and unless these fetch a good figure it will lose money for the grower.

Among the later kinds Fulton stands out prominently when well done, its rich golden yellow not being surpassed by

any other variety ; it is, however, a safer plant for the southern than the northern grower, as, in common with other late sorts, it is apt to show a preponderance of blind shoots in dull seasons, when the wood does not ripen properly.

The number of Chrysanthemums flowering after Christmas is very limited, and the profitable ones may be counted on the hand ; two of the best are Boule de Neige and Golden Gem, white and yellow, as the names imply. In habit, &c., they are very similar, being dwarf and sturdy ; the flowers are a nice, useful size, though just a trifle stiff, the petals being short and straight.

The last on my list, Mme. Pages, I have never seen outside our own collection ; its fault is its lanky habit, the plants running up to about 7 feet ; it is nevertheless very valuable, blooming naturally up to the end of January. The flowers are Jap in type, and last well for a fortnight or so ; on first opening, the centre is lemon-yellow, but the whole bloom becomes white with age.

It will be noticed that the above list contains no Pompon or single kinds. The latter, though very pretty, will not travel ; while the Pompons are too round and stiff to suit the modern taste. If I did include one Pompon, it would be Snowdrop, a pretty little miniature white, very pure, and in late seasons lasting up to Christmas.

My time is so nearly gone that I cannot say much about the Chrysanthemum as a market plant, more than just to give a list of the most suitable varieties to grow. These are chosen principally for their dwarf habit and freedom in flowering, as it is obvious that a kind producing two or three flowers (however beautiful) on the top of a lanky stem is useless as a decorative plant. The following is my selection :—

Summer Bloomers.—Mignon, yellow ; L'Ami Couderchet, primrose ; Piercy's Seedling, bronze ; Souv. de M. Rampont, purple ; White St. Crouts and Mme. Leoni Lassali, ivory white ; the Desgrange family ; La Vierge, white ; Alex. Dufour, purple ; Roi des Précoces, crimson ; Capucine, bronze ; William Holmes, bright crimson ; Isidore Feral, pink ; Sœur Melanie, white ; Cedo Nulli (in three colours), and Précocité, bronze red (of Délaux, not the early yellow).

In addition to the above, useful little plants may be made by striking any free-flowering variety of good habit, very late in

the season. The cuttings should be inserted the end of June or early in July, giving them a shady place under a north wall. When well rooted pot on into 5-inch pots, giving plenty of elbow room, to prevent drawing. The cuttings are taken from a few old stumps planted out for the purpose; or, in case of the Pompons, which will bear late stopping, from the tops of the strongest leaders on the sale plants.

You will observe that in my selection for plants I have not included anything flowering later than the end of October, as I do not think the late varieties pay at all as pot plants. The reason is that, if placed too closely when housed, they lose all the lower foliage and become unsightly; while to give sufficient space to ensure good foliage to the pot, means that the house will take less than a quarter the number it would hold if intended for cutting.

Any remarks on the commercial aspect of *Chrysanthemum* growing would be incomplete without some reference to the exceptionally early frosts which have visited many districts lately, and made such havoc with the plants that the title of my paper will appear unpleasantly ironical to many growers. It is not advisable, I think, to go in for housing the plants much before October 1, as the blooms suffer seriously if placed under glass too early, especially if the weather be warm and close, in addition to which the houses are not generally ready for their reception before that date. On the other hand, the erection of light framework, to carry rollers and tiffany in the fashion of greenhouse blinds, as has been proposed, would be so expensive, where the plants are grown in large quantities, as to absorb any probable profits. If these early frosts attacked the whole country equally, an enterprising man might recoup himself for the cost of protection by the enhanced prices he would obtain owing to the scarcity following them; but as they are generally very local, he would probably have to compete in the market against men whose flowers had escaped without the cost of sheltering.

I have come to the conclusion that in this matter we shall have to go on as we are, taking comfort from the fact that we have to go back nearly forty years to find parallels to the September frosts of the last few seasons, and hoping that another forty may elapse before we are called to exercise our ingenuity in providing against them again.

SUMMER AND EARLY AUTUMN CHRYSANTHEMUMS.

By Mr. W. PIERCY.

By early-flowering Chrysanthemums I mean such as flower naturally before the beginning of October, and call such as bloom during that month semi-early, these terms being about equal to the French descriptions *précocé* and *hatif*.

I have in my paper before the National Chrysanthemum Society on these sorts, reported in the *Gardeners' Magazine* of September 21st, and *Journal of Horticulture*, September 19th, 1889, dealt somewhat with the modern history of these early sorts, which began about 1868, and said also some little as to their ancient record before that date. I have a number of printed and written lists previous to that time, and my friend Mr. Harman Payne has kindly supplied me with several scarce ones, but I think that my limited space will be better used in the consideration of the present and future than in dealing with the dead past, which I value chiefly as lighting up the immense future and progress of the present time; besides, I know but one really good old sort that is not surpassed, and that is Frederick Pelé, a crimson Pompon, which, probably, is not beaten because crimsons are so very scarce.

The main uses of early varieties are not so much to win prizes, of which there are few offered at present, and which somewhat militates against their more rapid development, as decorative ground and pot plants. During the months of September and October they are mostly useful to supply vast masses of cut flowers. They, except a few sorts such as the Desgrange family, do not show their most valuable qualities as the bud-picked plants of the late show kinds, but their excellences are seen when more naturally grown. The points of the best varieties in the late sorts have to be judged from an exhibition point of view, so much so that the minds of many judges of the late sorts become so moulded to judge of plants and flowers of that description, that there are very few indeed fully competent to detect the most valuable features of these early kinds; in fact, unless some considerable experience in the positive practical culture of them has been had, I do not think it possible that a proper and efficient decision can be obtained. My opinion is, that we have not only

to grow new sorts, but, so to speak, to cultivate the judges of them and develop the taste. Hitherto, with the late sorts, we may consider they have been exotics in the climate of England, requiring the aid of glass to flower them, that flowering being too late to hope for seed; and even when, by extraordinary care, early shoots were bloomed soon in the season under glass, there was wanting the aid of vast numbers of flies, bees, and other flying things so essential and prevalent in July and August. When I first found that *Nanum*, the "Sistou" of the French, bloomed in May and June, and that the wild English *Chrysanthemum leucanthemum*, or Ox-eye Daisy, bloomed in May and ripened good seed, I quite expected to get good seed from it also; but for years I failed with that and other early sorts, till the conclusion came that all these beautiful double flowers, if perfect, were females without pollen. This seems correct, for if a good double sort is grown in a poor, starved way, there will sometimes be what we call a weedy eye in the blooms, and this weedy eye is the seat of the florets that produce the pollen, and, as far as my experience goes, leads me to the conclusion that the florets of this weedy eye are both male and female. Thus, then, if we have quite double flowers and want seed of them, we must have growing near at hand, and in bloom at the same time, either poor flowers of the same sort, or, probably, what is much better, single or semi-double plants of other sorts. This belief is confirmed from the fact that I have raised good seed and seedlings from Salter's Early Blush, which was quite double, and as fine a plant of that sort as I ever grew. Mr. Adam Forsaith has said that "hybridising the Chrysanthemum is fudge!" (See *Gardeners' Magazine*, April 20, 1872; in Burbidge's "The Chrysanthemum," page 45.) But this is quite wrong. Dr. Walcott, of New York, has done this artificially, and the semi-early variety, Sam Henshaw, is one of the direct results of a cross between Viceroy of Egypt and Comte de Germiny; and though my own seed was not obtained by a regular cross, but by the natural action of flies and bees, the plants and sorts thus produced are quite as valuable, though perhaps a greater quantity of seedlings have to be raised to procure one good sort from the seed naturally fertilised. Generally speaking, probably from 200 to 400 seedlings would have to be raised my way to get one worth saving, but I do not know Dr. Walcott's or any other raiser's experience in that respect.

Early Chrysanthemums, like many other plants, have a tendency to sport, firstly from seed, and secondly as plants.

Sports from seed all gardeners and growers are familiar with, and are called "rogues" because they do not come like the parents. Many of us have to unlearn as cultivators what we were taught at school, viz., that everything came after its kind, but we find that from seed this is only so in a limited degree. When we come to think of the strange jumps from the parent in Chrysanthemums, and that the seed of a poor nearly single light pink sort should produce such a beautiful little double white as the Duchess of Fife, we are astonished. There is no missing link, but a leap at one bound to a plant of a totally different sort. It seems to me that there are some other missing links that will never be found, because they never existed. Although it is not yet quite demonstrated that what we consider living things are by the laws of nature evolved from inorganic matter, it seems most probable that very various species can be evolved from one another if only time and circumstances are long and wide enough. In the case of seedling Chrysanthemums, the progress is not obtained, as in some other plants; bit by bit, a little strain each season selected from among a great number, but apparently mainly by these jumps among the seedlings. When we grow the ordinary trade seed of Chrysanthemums we see a most wonderful variation in the character of the resulting plants, and naturally, when we know no better, ascribe this to the probability that the seed came from mixed plants; but when we grow the seed of early sorts from separate plants, and mark and grow this seed separately, the resulting plants are astonishing, for out of a hundred plants there are hardly two alike—some are tall, some short, some slender, others stout, while some are late in flowering and a less number early; still, in the seed from a single plant there are a few in which may be detected a family likeness.

If the seed of the wild English Chrysanthemum (or Ox-eye Daisy) be grown, the seedlings are all exactly alike and like the parent, though I never grew a sufficient number to say that in ten thousand there might not be found some slight variation. There is another thing as regards Chrysanthemum seedlings—the female or petal seeds do not seem to give double flowers as they do in some plants. If the outside seeds in the pods of the common Marigold and the African and French ones only are sown,

a very great general improvement is effected in many of the progeny, and this follows the general tendency that every part of every plant has, a tendency on propagation to produce the character of the part of the plant from which it is grown. Thus, if a peck of Potatoes is cut into three sorts of sets, and these sets are grown separately, the product in each case resembles the part from which the set is cut. Thus, cut the crown of the Potato off for one set, and the single bottom eye for another, planting the middle for the third; in this case only the middle resembles the parent, the crown Potatoes being covered with eyes, while the bottom eye sets have scarcely any. The valuable knowledge of this law is a great help in the production of variations, but seems to give us little or no clue to the reason of sports in individual sorts of plants or single plants themselves, or why a Chrysanthemum, after growing from seed for years in one colour and habit, should sport to another colour, and in my own place, in one instance, into another *habit*. This was when the Pompon Fiberta, early yellow sort, sported to a late sort with a different habit, leaf, and flower, being taller and later, and the colour of the flower bronze, besides being of quite different shape. This was a sucker from the root, being the most wonderful sport I know, all others being only in colour of the flowers or leaves. I named the new sort Root Sport. But, with all our observation, we at present seem quite in the dark as to why sports originate on plants—that is, why part of a plant should come of a different colour and remain so. This seems to occur more frequently in England than in the United States, though this may only be owing to more plants and sorts being cultivated here. Another feature in the occurrence of sports is, that when a sport in a Chrysanthemum arises in one place, it often does so within a season or so in another; there are many cases on record of this. My own belief is, that a very slight chemical change in some way effects the alteration, and of course that in a state of nature may mean whether a plant can survive or not. Just so, too, in art—if a sport is useful we propagate it, if not, it is thrown away.

It frequently happens that one of the early or semi-early sorts gains a certificate from the fact that it is grown for show in the late sort way—that is, disbudded and exhibited as a fine flower or two, which is no criterion of its merits, such as belong to the early sorts. Pomponium some time back obtained a certificate,

and it is a very poor sort, while Sam Henshaw, which is a plant much more deserving of culture, was presented twice before one was granted. This arises because judges decide from the standards of exhibition sorts and the plants and flowers presented to them on committee, but not, on the evidence of growers, from a flower-producing and decorative point of consideration. The early kind, Pynaert van Geert, is good when disbudded, but is not if all the buds are left on; then it is a poor thing when grown naturally. In contrast to this is Mlle. Lacroix, which, as a semi-early, is good in every way and for all purposes, even as a moderately dwarf plant from late struck cuttings at the beginning of May.

There are many varieties that have been rejected from their tall slender way of growing; Henderson and Son and Hendersonii are instances, the latter bearing such masses of flowers that it is almost impossible to keep the plant up when in bloom. Too much attention of raisers cannot be given in all Chrysanthemums, especially in the early sorts, to the obtaining of dwarf varieties, because the most excellent flowers can be grown on such plants, as well as those so very tall. The late Avalanche is an instance of this, and I think American Flora, in the semi-earlies, is another. I am not quite certain on this latter, as this is the first season I have grown it. When a plant has to grow 6 or 8 feet high to produce the same results as one 3 or 4 feet, I think it a waste of time, labour, and space. As for cutting down, that is a mere artifice.

It has been said we want more colour in the early sorts, and so we do; but at present we have no good early sorts to start from. Roi des Précoces only flowers in October, and William Holmes is in the same position.

I expect to obtain from America next season an early dark single kind; and this is what we want in both Pompons and Japanese sorts, as most of the early kinds are Pompons. I should wish to draw the attention of seedling growers to this want, for the door to more colour lies in this direction. Probably someone in the South of Europe, America, or elsewhere will be kind enough to notice this and give us a little help.

I have not space here to name the best sorts now in cultivation, and must refer to past papers in the Press and my old lists, but may say that the first good English seedling of the early

sort ever raised was the one named Piercy's Seedling; this was grown from American seed by Mr. John Thorpe, in America; but we have now several from English seed grown here at Forest Hill, of which Golden Shah is not only the best English seedling of the early sort, but the best early yellow Pompon in cultivation, English or foreign. Duchess of Fife is also the very best early dwarf and double white Pompon. It is a real beauty, and different from all others. Goldsmith, White Lady, Miss Phillis Broughton, Mr. Selly, Jacintha, Clara, Dodo, and a few others not yet named, are all the result of the seed grown here, showing clearly that the difficulty of seeding the early sorts in England is not one of climate, but of pollen in proper condition during the months of August and September, and in some seasons perhaps July and October.

A hearty vote of thanks was proposed to the Chairman, the Readers of Papers, and to the Exhibitors, and was carried with acclamation.

DIGEST OF STATISTICS

RELATING TO THE

CHRYSANTHEMUM CONFERENCE

1889

PREPARED BY

MR. EDWIN MOLYNEUX, F.R.H.S.

HON. SEC. TO THE CONFERENCE

* The spelling of the names of the flowers has, as far as possible, been made to accord with the National Chrysanthemum Society's List.

LISTS OF VARIETIES COMPILED BY THE JUDGES
IN THE VARIOUS SECTIONS FROM SPECIMENS
EXHIBITED.

SECTION A.—*Judges*: Mr. H. Cannell, Mr. A. M. Pollett, and
Mr. W. Wildsmith.

BEST VARIETIES OF ALL CLASSES FOR OUT-DOORS, GARDEN
DECORATION, WALLS, &c.

La Vierge, white.	Flambeau Toulousain, rose, tipped white.
Dr. Sharpe, crimson.	Golden Fleece.
Mrs. Mardlin, rose.	Mrs. Cullingford, white.
George Glenny, sulphur.	Nanum, bluish white.
Mrs. G. Rundle, white.	Précocité, reddish crimson.
President, carmine.	St. Mary, bluish white.
Golden Trevenna.	Mme. Jolivart, white.
Rose Trevenna.	Alexandre Dufour, violet.
White Trevenna.	Drin Drin, yellow.
Mandarin, light rose.	Félicité, orange yellow.
Elsie, sulphur.	Isidore Feral, rosy lilac.
Early Red Dragon, red.	Margot, rosy violet.
Mme Desgrange, white.	La Charmeuse, purple.
G. Wermig, light yellow.	Roi des Précoces, red
Mrs. Hawkins, golden yellow.	M. E. Pynaert van Geert, yellow.
Alice Butcher, bronze.	Anastasio, purple.
Lyon, rosy purple.	Little Bob, brown.
Frederick Pelé, red.	James Salter, pink.
Fiberta, yellow.	

SECTION B.—*Judges*: Mr. D. Donald, Mr. W. Mease, and
Mr. J. Wright.

I.—BEST INCURVED VARIETIES FOR SPECIMEN BLOOMS,
ARRANGED IN ORDER OF MERIT.

Golden Empress.	Prince Alfred.
Lord Alcester.	Jardin des Plantes.
Empress of India.	Novelty.
Miss M. A. Haggas.	Mr. Brunlees.
Princess of Wales.	Hero of Stoke Newington.
Alfred Salter.	White Venus.
Mrs. W. Shipman.	Venus.
Golden Queen of England.	Cherub.
Violet Tomlin.	Nil Desperandum.
Jeanne d'Arc.	Eve.
John Salter.	Beauty.
Queen of England.	Mrs. Dixon.
Refulgence.	George Glenny.
Lady Hardinge.	Mrs. G. Rundle.
Prince of Wales.	Rev. J. Dix.
Lord Wolseley.	Emily Dale.
Mrs. Heale.	Bronze Mr. Bunn.
Barbara.	

II.—BEST TWELVE INCURVED VARIETIES, INCLUDING THE
GREATEST VARIETY OF COLOURS.

Golden Empress.
Empress of India.
Alfred Salter.
Lord Alcester.
Violet Tomlin.
Lord Wolseley.

John Salter.
Princess of Wales.
Miss M. A. Haggas.
Refulgence.
Prince Alfred.
Jeanne d'Arc.

SECTION C.—*Judges*: Mr. R. F. Jameson, Mr. W. Holmes, and
Mr. E. Wills.

I.—BEST FIFTY JAPANESE VARIETIES FOR SPECIMEN BLOOMS,
ARRANGED IN ORDER OF MERIT.

Avalanche.
Edwin Molyneux.
Boule d'Or.
Sunflower.
Val d'Andorre.
Mons. Bernard.
Album Fimbriatum.
Mrs. Falconer Jameson.
Etoile de Lyon.
Stanstead White.
Elaine.
Fimbriatum.
Maiden's Blush.
Mme J. Laing.
Mlle. Lacroix.
Stanstead Surprise.
Mons. Baco.
M. E. A. Carrière.
Criterion.
Puritan.
Annie Clibran.
Japonais.
Ralph Brocklebank.
Yokohama Beauty.
Eynsford White.

Roi des Japonais.
Belle Paule.
Thomas Stephenson.
Moonlight.
Jeanne Delaux.
L'Automne.
M. A. de Leau.
Thunberg.
Sarah Owen.
Mr. J. Laing.
Baron de Prailly.
Cardinal Desprez.
Comte de Germiny.
Mons. Freeman.
Mr. Garnar.
Miss Gordon.
Bertha Flight.
Carew Underwood.
Peter the Great.
Florence Percy.
Hiver Fleuri.
M. Brunet.
Dormillion.
C. Sharman.
E. Audiguier.

II.—TWELVE JAPANESE VARIETIES, INCLUDING THE GREATEST
VARIETY OF COLOURS.

Sunflower.
Jeanne Delaux.
Avalanche.
Edwin Molyneux.
Boule d'Or.
Val d'Andorre.

Mme. C. Audiguier.
Maiden's Blush.
Stanstead Surprise.
Ralph Brocklebank.
Belle Paule.
Mons. Bernard.

SECTION D.—*Judges*: Mr. N. Davis, Mr. C. Orchard, and
Mr. R. Parker.

I.—BEST TWELVE REFLEXED.

King of Crimson.
Mrs. Mayes.
William Early.
Mrs. Forsythe.
Golden Christine.
Phidias.

Pink Christine.
Peach Christine.
Dr. Sharpe.
Annie Salter.
Emperor of China.
Cloth of Gold.

II.—BEST TWELVE LARGE ANEMONE.

Nelson.
Fleur de Marie.
Empress.
Mrs. Judge Benedict.
Gluck.
Miss Annie Lowe.

Lady Margaret.
Prince of Anemones.
Acquisition.
J. Thorpe, Junior.
Mme. Goderau.
La Marguerite.

III.—TWELVE JAPANESE ANEMONE.

Fabian de Mediana.
James Weston.
Minnie Chaté.
Marguerite Villageoise.
Mons. Pankoucke.
Jeanne Marty.

Souvenir de Mme. Blandinières.
Ratapoil.
Mlle. Cabrol.
Sœur Dorothee Souillé.
Mme. Bertha Pigny.
Bacchus.

IV.—TWENTY-FIVE POMPONS.

Rose d'Amour.
Cendrillon.
Mme. Hoste.
Nelly Rainford.
Marabout.
Eléonore.
Rosinante.
Adèle Prisetete.
Feu d'Amour.
Eclipse.
Golden Mlle. Marthe.
Black Douglas.
Toussaint Maurisot.

La Pureté.
Mustapha.
Golden Marabout.
Pygmalion.
Sunset.
James Forsythe.
Alice Stevens.
Prince of Orange.
Mlle. Elise Dordan.
Mlle. Marthe.
Fanny.
St. Michael.

V.—TWELVE POMPON ANEMONE.

Antonius.
Regulus.
Marie Stuart.
Astrea.
Sidonie.
Mme. Sentir.

Perle.
Queen of Anemones.
Calliope.
Jean Hatchette.
Mme. Montels.
Astarte.

VI.—TWELVE SINGLE VARIETIES.

Jane.	Lily Owen.
Mary Anderson.	Rose Owen.
Mrs. M. A. Le Mout.	Yellow Jane.
Crushed Strawberry.	Buttercup.
Pure Gold.	Scarlet Gem.
Mrs. Wills.	Souvenir de Londres.

SECTION E.—*Judges*: Mr. E. Berry, Mr. J. Doughty, and
Mr. J. Laing.

BEST VARIETIES IN ALL SECTIONS FOR TRAINED SPECIMEN
PLANTS FOR EXHIBITION.

I.—INCURVED.

Mrs. G. Rundle.	Golden Empress.
George Glenny.	Mrs. W. Shipman.
Lady Hardinge.	Lord Derby.
Guernsey Nugget.	Queen of England.
Golden Beverley.	Mrs. Dixon.
Lady Talfourd.	John Salter.
Gloria Mundi.	Mrs. Sharpe.
Beverley.	Jardin des Plantes.
Empress of India.	

II.—REFLEXED.

Golden Christine.	Emperor of China.
Dr. Sharpe.	Elsie.
Cloth of Gold.	Chevalier Domage.
White Christine.	Annie Salter.

III.—JAPANESE.

Hiver Fleuri.	Mme. J. Laing.
Bouquet Fait.	Mme. B. Rendatler.
Val d'Andorre.	Mme. C. Audiguier.
Peter the Great.	Fair Maid of Guernsey.
Mme. Mezard.	L'Ile des Plaisirs.
Elaine.	Mme. de Sevin.
Mons. Bernard.	Mlle. Lacroix.
Source d'Or.	

IV.—POMPONS.

Nelly Rainford.	Mlle. Marthe.
Cedo Nulli, white.	Brilliant.
„ „ golden.	Black Douglas.
„ „ lilac.	Golden Circle.
Golden Mlle. Marthe.	Lizzie Holmes.

V.—ANEMONE POMPONS.

Marie Stuart.	Mr. Astie.
Antonius.	Mme. Montels.
Dick Turpin.	Scarlet Gem.
Queen of Anemones.	Perle.
Firefly.	

SECTION F.—*Julys*: Mr. W. Furze, Mr. C. Herrin, and
Mr. R. Owen.BEST VARIETIES OF ALL SECTIONS FOR GROWING AS
DECORATIVE PLANTS.

I.—INCURVED.

Mrs. Dixon.	Guernsey Nugget.
George Glenly.	Gloria Mundi.
Mrs. G. Rundle.	Miss Hope.
Baron Beust.	Jardin des Plantes.
Barbara.	Venus.
Lady Hardinge.	Bronze Jardin des Plantes.
John Salter.	Virgin Queen.
Lady Talfourd.	Yellow Perfection.
Mrs. W. Shipman.	

II.—JAPANESE.

M. Freeman.	Source d'Or.
Mme. de Sevin.	Elaine.
Mr. Garnar.	Edouard Audiguier.
M. Astorg.	Isidore Feral.
M. Bergman.	Tokio.
Avalanche.	Fleur des Bois.
Hiver Fleuri.	Buttercup.
Mme. B. Rendatler.	M. N. Davis.
Sarah Owen.	Elsie.
Mme. J. Laing.	Val d'Andorre.
Mme. Rozain.	Orphée.
Edwin Molyneux.	Wm. Stevens.
Peter the Great.	Mons. Bernard.
William Holmes.	Feu de Bengale.
L'Adorable.	L'Or du Rhin.
Hamlet.	La Nymphe.
Triomphe du Nord.	Wm. Robinson.
L'Ile des Plaisirs.	Jas. Salter.
Mrs. Townsend.	Lady Selborne.
M. Dargonne.	

III.—REFLEXED.

Chevalier Damage.	Prince Albert.
Cullingfordii.	Beauté du Nord.
Mount Etna.	Distinction.
Annie Salter.	Daphne.
Dr. Sharpe.	Amy Furze.
Phidias.	James Carter.
White Christine.	Elsie.
Golden Christine.	Julie Lagravère.
Mrs. C. Orchard.	Pink Christine.

IV.—JAPANESE ANEMONE.

Sœur Dorothee Souillé.	Bacchus.
Jeanne Marty.	

V.—LARGE ANEMONE.

Gluck.
Fleur de Marie.
Prince of Anemones.
Cincinnati.

Gladys Spaulding.
La Marguerite.
J. Thorpe, Junr.

VI.—POMPON ANEMONE.

Aglaiia.
Antonius.
Mme. Montels.
Mme. Sentir.
Astarte.
Calliope.

Mme. Chalonge.
Marguerite de Coi.
Marie Stuart.
Mr. Astie.
Rose Marguerite.
Sidonie.

VII.—POMPONS.

Black Douglas.
Cedo Nulli, white.
 ,, golden.
 ,, lilac.
Fanny.
Golden Mlle. Marthe.
Mlle. Elise Dordan.

Lizzie Holmes.
Miss Wheeler.
Osiris.
St. Michael.
Trevenna, golden.
 ,, white.
 ,, rose.

VIII.—SINGLE.

Jane.
Yellow Jane.
Mary Anderson.
Mrs. A. Le Moulst.

Ada Owen.
Rose Owen.
Souvenir de Londres.
Admiral Sir T. Symonds.

NAMES OF PERSONS WHO WERE KIND ENOUGH TO SEND IN THE
STATISTICAL RETURNS FROM WHICH THE SUCCEEDING
TABLES HAVE BEEN COMPILED.

Abraham, A., Hazelholt, Bishop's Waltham, Hants.
Ashman, Frank, Billingbear Park, Wokingham.
Barclay, Thos., Beech Cliff Gardens, Keighley, Yorkshire.
Beckett, C., Juniper Hill, Dorking, Surrey.
Beckett, Edwin, Aldenham House Gardens, Elstree, Herts.
Berry, E., Roehampton House Gardens, Roehampton.
Bolas, G., Hopton Gardens, Wirksworth.
Bradford, R., Addington Gardens, St. Mary's Road, Wimbledon.
Brown, James, Great Dood Gardens, Reigate, Surrey.
Buss, J., West Hill, Epsom, Surrey.
Carling, T., Dove Park Gardens, Woolton, Liverpool.
Castle, Lewis, Hotham House, Merton, Surrey.
Chadwick, E., Hanger Hill House Gardens, Ealing, W.
Cherry, E., Norfolk House, Streatham, Surrey.
Clark, W., Eversley Gardens, Herne Hill, S.E.

- Coombs, E., Roseland Gardens, Teddington, Middlesex.
Cox, C., Brickendon Grange, Hertford.
Crump, W., Madresfield Court Gardens, Malvern, Worcester.
Dance, W., Gosfield Hall Gardens, Halstead, Essex.
Davey, W., Cedar House Gardens, Stamford Hill, N.
Dean, R., 42 Ranelagh Road, Ealing.
Dewar, A., Falkland Palace Gardens, Fife, N.B.
Dilley, J., Bowden Hall, Market Harborough.
Doughty, J., Angley Park Gardens, Cranbrook, Staplehurst, Kent.
Douglas, Jas., Great Gearies Gardens, Ilford, Essex.
Duck, Wall Geo., Chard, Somerset.
Dunkley, H., Brookland House Gardens, Market Harborough.
Durrell, W., Hambleton, Hants.
Elliott, H., Leyden House Gardens, Mortlake, Surrey.
Fowler, Chas., Barron Hill Gardens, Henfield, Sussex.
Furze, W., Roselands, Teddington, Middlesex.
Gale, H., Langton House Gardens, Gosport, Hants.
Gibson, Chas., Morden Park Gardens, Mitcham, Surrey.
Godby, F., The Oaks Gardens, Burgess Hill, Sussex.
Groves, G., Rangemore Gardens, Burton-on-Trent.
Haggart, A., Moor Park Gardens, Ludlow.
Hayes, F. R., Woodville Gardens, Keighley, Yorkshire.
Haywood, T. B., Woodhatch Lodge, Reigate, Surrey.
Herrin, C., Dropmore Gardens, Maidenhead.
Hewett, J., Hillside House Gardens, Hythe, Kent.
Hill, D., Beachboro' Park Gardens, Hythe, Kent.
Hill, James, Springfield Gardens, Withdean, Sussex.
Hopkins, Jas., High Cross Gardens, Framfield, Sussex.
Horril, J., West Street, Havant, Hants.
Horsefield, J., Heytesbury Gardens, Heytesbury, Wiltshire.
Howe, W., Park Hill Gardens, Streatham Common, Surrey.
Inglefield, G., Tedworth House Gardens, Marlborough.
Ironsides, Briscoe H., Foot's Cray, Kent.
Jupp, W., 24 Waldrons, Croydon, Surrey.
King, G., Glenchess Gardens, Loudwater, Rickmansworth.
Kipling, J., Knebworth House Gardens, Stevenage, Herts.
Lampard, G., 6 Hogarth Terrace, Chiswick.
Lofley, G., Knighton Church Road, Leicester.
Lyne, J., Belvedere Gardens, Wimbledon, Surrey.
Lyster, H., Easton Lodge Gardens, Dunmow, Essex.
Mease, W., Downside Gardens, Leatherhead, Surrey.

- Mercer, J., Childwall Hall Gardens, Liverpool.
Midgeley, M., Bankfield Gardens, Bingley, Yorkshire.
Mitchell, W., The Moorlands Gardens, Bracebridge, Lincoln.
Molyneux, E., Swanmore Park Gardens, Bishop's Waltham.
Moore, F., Blendon Hall Gardens, Bexley, Kent.
Morton, T. B., Mowden Bridge Nursery, Darlington, Durham.
Nearey, K., Holy Innocents' Gardens, Hornsey, N.
Owen, R., Castle Hill Nursery, Maidenhead.
Packman, W., The Elms Gardens, Foot's Cray, Kent.
Page, Chas., Highams Gardens, Bagshot, Surrey.
Parks, W., Fernside Gardens, Bickley, Kent.
Pearson, Messrs., Chilwell Nurseries, Nottingham.
Penford, Chas., Leigh Park Gardens, Havant, Hants.
Phillips, D., Ludgrove Gardens, New Barnet, Herts.
Piercy, W., 89 West Road, Forest Hill, S.E.
Pope, W., Highclere Castle Gardens, Newbury, Berkshire.
Quarterman, Jas., Silvermere Gardens, Cobham, Surrey.
Ray, W. J., Mount Pleasant Nursery, Green Street, Sittingbourne.
Russell, M., Henfield, Sussex.
Salter, C. J., Woodhatch Lodge Gardens, Reigate, Surrey.
Shenton, C., The Glen, Golden Common, Winchester.
Shoemith, H., Shirley, Croydon, Surrey.
Simpson, C. J., St. John's Nursery, Chelmsford, Essex.
Smythe, W., Basing Park Gardens, Alton, Hants.
Springthorpe, Geo., Gifford House Gardens, Roehampton, S.W.
Sturt, A., Mount Oak Gardens, Englefield Green, Staines,
Middlesex.
Trinder, G., Dogmersfield Gardens, Winchfield, Hants.
Turton, T., Maiden Erleigh Gardens, Reading.
Warden, Chas., Clarendon Park Gardens, Salisbury, Wiltshire.
Ward, H. W., Longford Castle Gardens, Salisbury, Wiltshire.
Warner, Geo., 12 Lingfield Road, Wimbledon, Surrey.
Weston, Jas., South Road, Clapham Park, London.
Wildsmith, W., Heckfield Gardens, Winchfield, Hants.
Wilkins, G. A., Castle Gardens, St. Helens, Isle of Wight.
Wills, E., Firs Gardens, Bassett, Southampton.
Winkworth, T., Childwall Hall Gardens, Liverpool.
Witty, J. H., Nunhead Cemetery, London, S.E.
Woodcock, W. K., Barkley Road Nurseries, Syston, Leicester.
Wright, J., Middle Temple Gardens, London.

SUMMARY OF RESULTS OF THE STATISTICAL RETURNS.

By Mr. E. MOLYNEUX, F.R.H.S., Hon. Secretary of the Chrysanthemum Conference.

The following tables, compiled from returns made by ninety-five persons interested in the growth of the Chrysanthemum, cannot fail to be of much interest to lovers of this flower, as showing the prevailing ideas with regard to selection of sorts for various purposes as invited by the Committee of the Chrysanthemum Conference. The preceding list of those who sent in returns is unfortunately not quite complete, as in a few instances the name and address of the sender had been omitted from the return.

I do not propose to give the names of all the flowers as sent in for the various classes or sections, as little good would be done by enumerating varieties which received a few votes only, but I think it will serve the purpose in view if a reasonable number are given in each section, sufficient for selection hereafter.

I.

THE BEST TWENTY-FOUR INCURVED VARIETIES FOR SHOW BLOOMS. (87 Voters.)

Only those which obtained more than five votes are included in this table.

	Votes		Votes
1. Queen of England	87	22. Emily Dale	40
2. Empress of India	86	23. Violet Tomlin	37
2. Princess of Wales	86	24. Princess Beatrice	36
4. Golden Empress	85	25. Mrs. N. Davis	35
4. Lord Wolseley	85	25. Golden Queen of England	35
6. Lord Alcester	84	27. Miss M. A. Haggas	26
7. John Salter	82	28. Mr. Brunlees	24
8. Alfred Salter	80	29. Cherub	23
8. Jeanne d'Arc	80	30. Bronze Queen of England	21
10. Prince Alfred	77	31. Prince of Wales	19
11. Jardin des Plantes	74	31. Novelty	19
12. Lady Hardinge	73	33. White Venus	18
12. Mrs. Heale	73	33. Bronze Jardin des Plantes	18
14. Barbara	69	35. Mabel Ward	17
15. Hero of Stoke Newington	68	36. Charles Gibson	16
16. Princess Teck	67	37. Venus	13
16. Mrs. W. Shipman	67	38. Baron Beust	11
18. Empress Eugénie	59	39. Lord Eversley	10
19. Nil Desperandum	55	40. Eve	9
20. Mr. Bunn	54	41. Beverley	8
21. Refulgence	52	42. Lady Slade	6

From this list it will be seen that, in selecting the best twenty-four incurved varieties, eighty-seven growers have named no less than forty-two sorts; indeed, as many as seventy-six were named altogether, which shows the wide range over which the fancies of voters extend. It will be seen that the large-flowered kinds are the favourites, notably the "Queen" family, headed by the Queen of England herself, which is the parent of the batch introduced as long ago as 1847, many of the newer kinds take good positions—as Lord Wolseley, Jeanne d'Arc, sports from Princess of Wales and Mrs. Heale—Violet Tomlin and Miss M. A. Haggas; while what is known as the "Teck" family, represented by five of the type, are highly thought of by cultivators. As many as thirty-four varieties received less than six votes, and therefore are not noted here. Many old favourites were mentioned which are seldom seen nowadays. Bronze Queen of England, with twenty-one votes, takes the thirtieth place.

II.

THE BEST TWENTY-FOUR JAPANESE VARIETIES FOR SHOW
BLOOMS. (85 Voters.)

Only those which obtained more than ten votes are included in this table.

	Votes		Votes
1. Mme. C. Audiguier	83	27. Mr. H. Cannell	24
2. Edwin Molyneux	82	28. Sarah Owen	23
3. Avalanche	80	29. Mrs. J. Wright	21
4. Belle Paule	78	29. Florence Percy	21
4. Boule d'Or	78	31. M. J. M. Pigny	20
6. Meg Merrilies	70	32. M. Tarin	19
7. Ralph Brocklebank	69	32. Mrs. H. Cannell	19
8. Fair Maid of Guernsey	67	32. Album fimbriatum	19
9. Mlle. Lacroix	66	35. Fernand Feral	16
10. Criterion	58	35. Stanstead White	16
10. Thunberg	58	35. Maiden's Blush	16
12. Mme. Laing	55	38. Etoile de Lyon	15
13. Baron de Prailly	54	39. M. Brunet	14
14. Comte de Germiny	52	40. M. Freeman	13
14. M. Marrouch	52	40. Edouard Audiguier	13
14. J. Delaux	52	42. Mme. B. Rendatler	12
14. Carew Underwood	52	42. M. Ardène	12
18. Val d'Andorre	51	42. Grandiflorum	12
19. Sunflower	40	42. M. F. Marrouch	12
19. Japonais	40	46. Mons. Bernard	11
21. Duchess of Albany	35	46. Mr. J. Laing	11
21. Elaine	35	46. Comtesse de Beauregard	11
23. Gloriosum	31	46. Balmoreau	11
24. Golden Dragon	30	46. Mme. de Sevin	11
25. Soleil Levant	28	46. Mrs. F. Jameson	11
26. Triomphe de la rue Châlet	26	46. Peter the Great	11

To obtain the best twenty-four Japanese varieties, eighty-five persons have named 133 sorts, from which I give fifty-two; all those which obtained less than eleven votes are not mentioned here. As will be seen from the list above, Mme. C. Audiguier worthily occupies the post of honour with eighty-three votes, being closely followed by Edwin Molyneux, Avalanche, and Boule d'Or, all of which represent distinct types and colours. Mons. Tarin occupies the thirty-second place with nineteen votes. Some of the newer sorts lose points, no doubt, through not being sufficiently well known to entitle them to confidence with the voters. From the list given a thoroughly representative collection can easily be chosen for the purpose for which they are intended.

III.

THE BEST TWELVE REFLEXED VARIETIES FOR SHOW BLOOMS.
(68 Voters.)

Only those which obtained more than two votes are included in this table.

	Votes		Votes
1. Cullingfordii	66	14. Distinction	22
2. King of Crimson	65	15. M. M. Tezier	18
3. Chevalier Domage	61	15. Felicity	18
4. Dr. Sharpe	59	17. Amy Furze	15
5. Golden Christine	58	18. Annie Salter	14
6. Cloth of Gold	56	19. Jewess	8
7. Peach Christine	50	20. Temple of Solomon	7
8. Pink Christine	49	21. Alice Bird	6
9. Phidias	43	22. Mount Etha	4
10. White Christine	37	22. Garibaldi	4
11. Putney George	29	24. Julie Lagravère	3
12. Mrs. Forsythe	26	24. Snowball	3
13. Elsie	23		

This section includes some of the oldest kinds in existence, some having been introduced as far back as the year 1845. This section provides perhaps the least interest of any in the whole Chrysanthemum family, partly on account of the flowers being, with few exceptions, the least adapted for ordinary decoration. The peduncles are generally weak, therefore the flowers are not self-supporting, which interferes much with their use for the purpose named; neither does this section embrace many sorts with decided colours, if I except some few of the older and newer sorts. With an improvement in this direction this section will no doubt increase in public favour. To the grower of specimen

plants this section provides him with some suitable materials which have a telling effect under good cultivation. Cullingfordii, perhaps the richest colour of any Chrysanthemum in existence, heads the list with sixty-six votes, being closely followed by King of Crimson, with only one vote less. The first twelve on the list are certainly of the true reflexed character, although Annie Salter perhaps represents the opinions of some growers as to the type which is the more correct; but as this variety comes a long way down in the voting, we must take the majority of opinions as being correct. Out of the large number of sorts chosen (forty-six) to select twelve from, I have noted twenty-five. Thus it will be seen that twenty-one obtained less than three votes.

IV.

THE BEST TWELVE LARGE-FLOWERED ANEMONE VARIETIES
FOR SHOW BLOOMS. (50 Voters.)

Only those which obtained more than two votes are included in this table.

	Votes		Votes
1. Lady Margaret . . .	49	15. St. Margaret . . .	12
2. Gluck . . .	46	16. Souvenir de Lardenne . . .	11
3. Fleur de Marie . . .	45	16. Nouvelle Alveole . . .	11
4. Empress . . .	41	18. Princess Louise . . .	9
5. Mrs. Pethers . . .	39	18. Minnie Chaté . . .	9
5. Acquisition . . .	39	20. Mrs. Judge Benedict . . .	7
7. Georges Sand . . .	37	20. King of Anemones . . .	7
8. Prince of Anemones . . .	33	22. Laing's Anemone . . .	6
9. Louis Bonamy . . .	29	23. Nelson . . .	5
10. Miss Annie Lowe . . .	28	24. Sabine . . .	4
11. Mme. Goderau . . .	22	24. Sunflower . . .	4
12. J. Thorpe, Junior . . .	21	26. Miss Margaret . . .	3
13. Grande Alvéole . . .	17	26. Mrs. M. Russell . . .	3
14. Emperor . . .	15	26. Mrs. R. Owen . . .	3

No less than forty-five varieties were named by the fifty voters in this class, which shows a surprising result in the number of Show Anemones which can be scraped together when the necessity arises. Although some here named as belonging to this section will not perhaps meet with unanimous approval, still it will be conceded that the first twelve do absolutely belong to this section, which, since the introduction of new sorts of decided colour, is fast becoming more popular. There is not the faintest shadow of a doubt but that Lady Margaret occupies her proper position by virtue of merit, Grande Alvéole worthily bringing up the rear. As in other classes, the newer kinds suffer for the same obvious reason.

V.

THE BEST TWELVE JAPANESE ANEMONES FOR SHOW BLOOMS.
(46 Voters.)

Only those which obtained more than one vote are included in this table.

	Votes		Votes
1. Mlle. Cabrol . . .	44	13. Mme. Thérèse Clos . . .	13
2. Fabian de Médiana . . .	42	14. Mme. Soléville . . .	12
3. Sœur Dorothee Souillé . . .	41	15. Margouline . . .	9
4. Ratapoil . . .	38	16. Mme. Ghys . . .	8
5. Mme. Clos . . .	36	16. Emperor . . .	8
5. Marguerite Villageoise . . .	36	18. Timbale d'Argent . . .	7
7. Mme. Bertha Pigny . . .	34	18. Ivanhoe . . .	7
8. Bacchus . . .	26	20. Mme. Murel . . .	4
8. Minnie Chaté . . .	26	21. Sabine . . .	3
10. Duchess of Edinburgh . . .	25	21. Mme. R. Owen . . .	3
10. Jeanne Marty . . .	25	23. Souv. de Mme. Blandinières . . .	2
12. Souvenir de Lardenne . . .	19	23. M. Pankoucke . . .	2

This section has made the most headway in a short time of any. The form of the flower is so attractive as to cause very general feeling in its favour, much more so than in the case of their more prim brethren—the large show kinds. No less than thirty-three names are given in the statistical returns which again would not meet with unanimous approval. From the twenty-four sorts here named, exception, I think, could only be taken to Emperor and Mons. Pankoucke; in which case eighteen sorts are still left to select twelve from.

VI.

THE BEST TWELVE JAPANESE REFLEXED VARIETIES FOR SHOW BLOOMS. (59 Voters.)

Only those which obtained more than two votes are included in this table.

	Votes		Votes
1. Elaine . . .	56	16. Avalanche . . .	11
2. J. Delaux . . .	53	17. Phœbus . . .	10
3. Maiden's Blush . . .	52	17. Mme. de Sevin . . .	10
4. Criterion . . .	48	19. M. M. Tezier . . .	8
5. Val d'Andorre . . .	47	19. Margot . . .	8
6. La Triomphante . . .	43	21. Roseum superbum . . .	7
7. Mons. Astorg . . .	42	22. Mlle. Lacroix . . .	6
8. L'Adorable . . .	38	22. L'Africaine . . .	6
9. Mons. J. Laing . . .	33	24. Belle Paule . . .	5
10. Amy Furze . . .	32	24. Flambeau . . .	5
11. Mons. W. Holmes . . .	30	24. Père Delaux . . .	5
12. Triomphe du Nord . . .	29	27. Mr. R. Brocklebank . . .	4
13. Dr. Macary . . .	24	28. La Nympe . . .	3
14. Mlle. Paule Dutour . . .	20	28. Edwin Molyneux . . .	3
15. Mons. H. Jacotot . . .	12	28. Meg Merrilies . . .	3

This section produces perhaps a more divided opinion than any other as to what properly constitutes a true Japanese Reflexed flower. No less than seventy-four varieties are named by fifty-nine voters, a pretty clear indication that much difference of opinion exists on the point.

VII.

THE BEST TWENTY-FOUR INCURVED, EXCLUDING THE "QUEEN" FAMILY. (59 Voters.)

Only those which obtained more than five votes are included in this table.

	Votes		Votes
1. Princess of Wales . . .	59	22. White Venus . . .	26
1. Hero of Stoke Newington .	59	23. Novelty . . .	25
1. Jeanne d'Arc . . .	59	24. Eve . . .	23
4. Lord Wolseley . . .	57	25. Miss M. A. Haggas . . .	22
5. Lady Hardinge . . .	56	26. Venus . . .	21
5. Prince Alfred . . .	56	27. Prince of Wales . . .	20
7. John Salter . . .	55	27. Mabel Ward . . .	20
7. Jardin des Plantes . . .	55	29. Baron Beust . . .	19
7. Mrs. Heale . . .	55	30. Charles Gibson . . .	18
10. Mr. Bunn . . .	54	31. Bronze Jardin des Plantes .	17
11. Mrs. W. Shipman . . .	53	32. Beverley . . .	16
12. Barbara . . .	52	32. Mrs. G. Rundle . . .	16
13. Princess Teck . . .	51	34. Mrs. Dixon . . .	14
14. Nil Desperandum . . .	48	35. Lady Carey . . .	11
15. Refulgence . . .	45	36. Lord Eversley . . .	10
16. Princess Beatrice . . .	41	36. Beauty . . .	10
16. Empress Eugénie . . .	41	38. George Glenny . . .	9
18. Mrs. N. Davis . . .	39	38. Angelina . . .	9
19. Cherub . . .	33	40. Isabella Bott . . .	8
20. Mr. Brunlees . . .	31	41. Lady Slade . . .	7
21. Violet Tomlin . . .	30	41. H. Shoemith . . .	7

This class was made to obtain a good selection of varieties irrespective of the "Queen" family, as it was felt that the type named most heavily overweighted the smaller, yet perfect sorts of Incurved blooms, this being considered to be the only way to keep these smaller kinds in the front. As this is an interesting class, I have given the names of forty-two varieties. The list shows that there is almost unanimous opinion about the first twelve sorts. Even Eve, the twenty-fourth flower, is well supported in the matter of points by the fifty-nine voters out of the eighty-five sorts named altogether.

VIII.

THE BEST TWELVE POMPON VARIETIES FOR SHOW BLOOMS.
(33 Voters.)

Only those which obtained more than two votes are included in this table.

	Votes		Votes
1. Mlle. Marthe	30	16. La Pureté	7
2. Golden Mlle. Marthe	27	16. Prince Victor	7
3. Mlle. Elise Dordan	26	19. Mrs. Bateman	6
4. Black Douglas	21	20. White Trevenna	5
4. President	21	20. Rubrum perfectum	5
6. St. Michael	20	20. Bob	5
7. Marabout	17	20. Pygmalion	5
8. Prince of Orange	14	24. Charles Dickens	4
8. Nellie Rainford	14	24. Toussaint Maurisot	4
10. Cedo Nulli	13	24. La Vogue	4
11. Fanny	12	24. Comte de Morny	4
11. Adèle Prisetete	12	28. Reine d'Or	3
13. Rosinante	10	28. Lilac Cedo Nulli	3
13. Golden Cedo Nulli	10	28. Model of Perfection	3
15. Lizzie Holmes	9	28. Miss Wheeler	3
16. Eléonore	7		

Pompons are generally appreciated by the majority of Chrysanthemum cultivators. They give a wealth of bloom, and do not occupy nearly so much space as the larger kinds. Thirty-three voters selected no less than seventy-six varieties from which the twelve best could be chosen. Thirty-one sorts are here noted, which would indeed be a lengthy list for one person, although all have their admirers no doubt.

IX.

THE BEST TWELVE ANEMONE POMPON VARIETIES FOR SHOW BLOOMS. (29 Voters.)

Only those which obtained more than two votes are included in this table.

	Votes		Votes
1. Antonius	29	13. Firefly	14
2. Mme. Montels	27	14. Rose Marguerite	11
2. Mr. Astie	27	15. Sidonie	10
4. Marie Stuart	24	16. Jean Hatchett	8
4. Calliope	24	16. Regulus	8
6. Miss Nightingale	22	18. Mr. Wyness	7
7. Queen of Anemones	18	19. Aglaia	6
7. Perle	18	20. Astrea	5
9. Mme. Sentir	17	21. Briolis	4
9. Mme. Chalonge	17	21. Grace Darling	4
9. Dick Turpin	17	23. Virginale	3
12. Marguerite de Coi	16	23. Magenta King	3

In this class a total of thirty-two sorts were named, of which number twenty-four are given in this list. The first twelve include, no doubt, the best of the varieties. The bright yellow Antonius heads the list, being hard pressed by Mme. Montels, which is an especially attractive sort.

X.

THE BEST TWELVE SINGLE VARIETIES. (13 Voters.)

Those which obtained only one vote are omitted from this table.

	Votes		Votes
1. Mary Anderson	10	14. Aurora	3
2. Jane	9	14. Gus. Harris	3
2. Miss E. Terry	9	14. Souvenir de Londres	3
4. Admiral Sir T. Symonds	8	14. Pure Gold	3
5. Miss Rose	7	14. Magenta King	3
6. David Windsor	6	14. Mrs. Kellock	3
7. Miss Cannell	5	14. Mrs. Langtry	3
7. Helianthus	5	23. Crushed Strawberry	2
7. Lady Churchill	5	23. Effie	2
10. America	4	23. Yellow Jane	2
10. Mrs. Wills	4	23. Scarlet Gem	2
10. White Perfection	4	23. John Tyars	2
10. Mrs. A. Le Mout	4	23. Canarieuse	2
14. Oriflamme	3	23. Pyrethrum	2
14. President Arthur	3	23. Miss Gordon	2

As many as sixty-two varieties were named by the thirteen voters, almost enough to make one wonder where they all come from. Thirty are here noted. The chaste and beautifully formed variety, Mary Anderson, stands at the head of the poll, being followed very closely by Jane (syn. Snowflake). This is a section which, I think, has a great future before it as a decorative class, flowering as the majority of them do in such profusion.

XI.

THE BEST TWELVE INCURVED FOR SPECIMENS. (53 Voters.)

Only those which obtained more than three votes are included in this table.

	Votes		Votes
1. Mrs. G. Rundle	53	9. Lord Alcester	24
2. Mrs. Dixon	50	10. Golden Empress	20
3. George Glenny	43	11. Guernsey Nugget	17
4. Prince of Wales	35	12. Mrs. Sharpe	16
5. Empress of India	34	12. Barbara	16
6. Queen of England	29	14. Jardin des Plantes	15
7. Lady Hardinge	27	15. Mrs. W. Shipman	14
8. John Salter	26	16. Mrs. Haliburton	13

	Votes		Votes
17. Venus	12	27. Lord Derby	6
17. Prince Alfred	12	27. Golden Queen of England	6
17. Beverley	12	30. Antonelli	5
20. Mr. Bunn	10	30. Jeanne d'Arc	5
20. Mr. Brunlees	10	32. Bronze Jardin des Plantes	4
22. Lord Wolseley	9	32. Nil Desperandum	4
22. Lady Talfourd	9	32. Refulgence	4
24. Princess of Teck	8	32. Faust	4
24. Hero of Stoke Newington	8	32. Alfred Salter	4
24. White Venus	8	32. Golden Beverley	4
27. Gloria Mundi	6		

No less than seventy-one names were given by the fifty-three voters in this class, showing that a great diversity of opinion exists amongst cultivators as to the best kinds for the purpose. Thirty-seven are here noted; the first twelve comprise a good selection no doubt.

XII.

THE BEST TWELVE JAPANESE VARIETIES FOR SPECIMENS.

(54 Voters.)

Only those which obtained more than three votes are included in this table.

	Votes		Votes
1. Hiver Fleuri	38	20. Mons. H. Jacotot	9
1. Peter the Great	38	21. Mons. W. Holmes	8
3. Mme. Bertier Rendatler	36	21. Avalanche	8
4. Bouquet Fait	35	23. Coquette de Castille	6
4. Lady Selborne	35	23. L'Adorable	6
6. Mlle. Lacroix	31	23. La Triomphante	6
7. Elaine	30	23. Mons. Tarin	6
8. James Salter	29	27. Mons. Freeman	5
9. Fair Maid of Guernsey	27	27. Maiden's Blush	5
10. La Nympe	25	27. Album plenum	5
11. Val d'Andorre	24	27. Roseum superbum	5
12. Triomphe du Nord	20	31. Joseph Mahood	4
13. L'Ile des Plaisirs	19	31. Fernand Feral	4
13. Source d'Or	19	31. Curiosity	4
15. Mme. de Sevin	17	31. George Gordon	4
16. Dr. Macary	13	31. Jeanne Delaux	4
16. W. Robinson	13	31. Mr. J. Laing	4
18. Margot	10	31. Tendresse	4
18. Mme. J. Laing	10	31. Soleil Levant	4

As might be expected, a large number of sorts were named by the fifty-four voters in this class, the Japanese section providing so many adaptable kinds for the purpose. Out of ninety-four sorts, thirty-eight are here noted. Hiver Fleuri and Peter the Great head the list, being equal in point of numbers. Perhaps there are no two varieties more often seen in an exhibition than these.

XIII.

THE BEST SIX VARIETIES OF REFLEXED FOR SPECIMENS.

(46 Voters.)

	Votes		Votes
1. Dr. Sharpe	36	13. Amy Furze	5
2. Golden Christine	34	14. Emperor of China	4
3. King of Crimson	32	15. Elsie	3
4. Chevalier Damage	31	16. Mount Etna	2
5. Pink Christine	29	16. Felicity	2
6. Mrs. Forsythe	22	18. Boule de Neige	1
7. Peach Christine	20	18. Distinction	1
8. White Christine	18	18. Phidias	1
9. Cullingfordii	13	18. Alice Bird	1
10. Julie Lagravère	12	18. Mlle. M. Tezier	1
11. Annie Salter	7	18. Beauté du Nord	1
12. Cloth of Gold	6		

In this class all the varieties named by the forty-six voters are given. Dr. Sharpe is, no doubt, in its proper position. It would indeed be a difficult task to find a more interesting or showy subject in the Chrysanthemum world than a well-grown specimen of this richly coloured variety. Many persons consider that Mrs. Forsythe and White Christine are identical. In that case this variety would occupy the leading position with forty votes.

XIV.

THE BEST TWENTY-FOUR VARIETIES FOR DECORATIVE PLANTS.

(42 Voters.)

Only those which obtained more than three votes are included in this table.

	Votes		Votes
1. Lady Selborne	28	21. Chevalier Damage	12
1. Mrs. G. Rundle	28	22. Jeanne Delaux	11
3. Mrs. Dixon	27	22. Triomphe du Nord	11
3. Elaine	27	22. L'Ile des Plaisirs	11
5. James Salter	26	25. Dr. Macary	10
6. La Nymphe	23	25. W. Robinson	10
6. Cullingfordii	23	27. Dr. Sharpe	9
8. Mlle. Lacroix	22	27. Mons. W. Holmes	9
9. George Glenny	21	27. Meg Merrilies	9
9. Bouquet Fait	21	27. L'Adorable	9
11. Mons. H. Jacotot	20	27. Edwin Molyneux	9
12. Mme. Desgrange	17	32. Criterion	8
12. Peter the Great	17	32. Florence Percy	8
14. Avalanche	16	34. Flocon de Neige	7
14. Mme. de Sevin	16	34. Fair Maid of Guernsey	7
16. King of Crimson	15	36. Maiden's Blush	6
17. Val d'Andorre	14	36. Simon Delaux	6
17. Margot	14	36. Red Dragon	6
19. Hiver Fleuri	13	39. Julie Lagravère	5
19. G. Wermig	13	39. Mr. J. Laing	5

	Votes		Votes
39. Mons. Astorg	5	50. L'Africaine	4
39. Boule de Neige	5	50. Barbara	4
39. George Gordon	5	50. Source d'Or	4
39. Sunflower	5	50. Perle des Blanches	4
39. Empress of India	5	50. Mons. Tarin	4
39. Sœur Melanie	5	50. Mr. Bunn	4
39. Progne	5	50. Mrs. W. Shipman	4
39. Fleur de Marie	5	50. Coquette de Castille	4
39. Jardin des Plantes	5	50. Tokio	4
50. Phœbus	4	50. William Clark	4
50. Amy Furze	4	50. Alfred Salter	4
50. Mons. Bernard	4	50. Elsie	4
50. Flambeau	4		

Naturally there would be a large number named in this class, as it presents such an opportunity to include all sections, the subject of decorative varieties having such a wide interpretation that it would be difficult to obtain anything like unanimity in this classification. Forty-two voters, in naming 178 varieties, came to the conclusion that Lady Selborne and Mrs. G. Rundle were entitled to the leading position with twenty-eight votes each; while Mrs. Dixon and Elaine, two sterling varieties, run the others exceedingly close. It will not be denied, I think, that the four mentioned are good for the purpose here required. From the sixty-five sorts noted a capital selection could be made.

XV.

THE BEST TWELVE SUMMER-FLOWERING VARIETIES.

(29 Voters.)

Only those which obtained more than two votes are included in this table.

	Votes		Votes
1. Précocité	21	15. Fiberta	6
2. Mme. Desgrange	18	15. Mme. Piccol	6
3. Flora	17	19. La Vierge	5
3. Blushing Bride	17	19. St. Crouts	5
3. Mme. Jolivart	17	21. M. F. Marrouch	4
3. Lyon	17	21. Yellow La Petite Marie	4
7. G. Wermig.	16	21. Mlle. Leoni Lassalli	4
7. Mrs. Cullingford	16	21. St. Mary	4
7. Alice Butcher	16	21. Mignon	4
10. Nanum	14	26. Madeline Davis	3
11. Mrs. Burrell	12	26. Mons. Pynaert van Geert	2
12. Salter's Early Blush	9	26. La Petite Marie	3
12. Frederick Pelé	9	26. Roi des Précoces	3
12. Mrs. Hawkins	9	26. Anastasio	3
15. Mrs. J. R. Pitcher	6	26. Alexandre Dufour	3
15. Mr. W. Piercy	6	26. Piercy's Seedling	3

Sixty-four varieties are named, from which a selection of the best twelve can be chosen. After this, from the remaining

twenty sorts, could be selected many other desirable kinds. Summer-flowering Chrysanthemums are not appreciated nearly so much as other sections, on account of their period of flowering taking place when many other kinds of flowers are obtainable.

XVI.

THE BEST TWELVE EARLY AUTUMN-FLOWERING VARIETIES.
(38 Voters.)

Only those which obtained more than three votes are included in this table.

	Votes		Votes
1. Lady Selborne	26	13. Simon Delaux	8
1. Mons. W. Holmes	26	17. La Triomphante.	5
3. James Salter	22	17. Sœur Melanie	5
4. Margot	20	17. Mrs. Dixon	5
5. Mme. Desgrange	19	17. George Glenney	5
5. Elaine	19	17. Isidore Feral	5
7. G. Wermig	17	17. Sam Henshaw	5
8. La Vierge	14	17. Bouquet Fait	5
9. Mlle. Lacroix	13	24. Mrs. Cullingford	4
10. Alexandre Dufour	12	24. Mrs. Burrell	4
11. Mons. Henri Jacotot	10	24. Flamme de Punch	4
11. Mrs. G. Rundle	10	24. Mr. J. Laing	4
13. Mme. Bertier Rendatler	8	24. M. Tarin	4
13. L'Île des Plaisirs	8	24. L'Africaine	4
13. Roi des Précoces	8		

A long list is also given under this heading by the thirty-eight voters, no less than ninety-five being mentioned. No doubt, where early Chrysanthemums are required to precede the ordinary November kinds, the list given provides excellent material from which a capital selection can be made.

XVII.

THE BEST TWELVE LATE-FLOWERING VARIETIES. (47 Voters.)

Only those which obtained more than three votes are included in this table.

	Votes		Votes
1. Princess Teck	37	16. Virginala	13
2. Ethel	33	16. Pelican	13
3. Meg Merrilies	32	18. Golden Gem	8
4. Grandiflorum	31	18. Boule d'Or.	8
5. Ralph Brocklebank	30	20. Snowdrop	7
6. Mrs. N. Davis	28	20. Thunberg	7
7. Ceres	27	22. Miss Maréchaux.	6
7. Mrs. C. Carey	27	22. Fair Maid of Guernsey	6
9. Hero of Stoke Newington	26	22. Golden Dragon	6
10. Charles Gibson	19	22. Moonlight	6
10. Boule de Nieve	19	26. Mrs. D. B. Chapman	5
12. Gloriosum	16	26. Princess Blanche	5
12. Lord Eversley	16	28. Yellow Ethel	4
14. Mrs. H. J. Jones	15	28. Duchess of Albany	4
15. W. G. Drover	14	28. Sarnia	4

This class creates much interest, as evinced by the fact that forty-seven persons responded to the invitation to send in the names of those they approved of for the purpose, which, in itself, is a capital one. Late-flowering varieties are much appreciated. The thirty varieties noted are really all good for the purpose; as many as seventy-eight were named as being suitable.

XVIII.

THE BEST SIX VARIETIES FOR STANDARDS. (33 Voters.)

Those which obtained only one vote are omitted from this table.

	Votes		Votes
1. Mrs. G. Rundle . . .	29	16. King of Crimson	2
2. George Glenny . . .	24	16. Mlle. Lacroix . . .	2
3. Mrs. Dixon . . .	21	16. Prince Alfred . . .	2
4. Dr. Sharpe . . .	11	16. Mrs. Townsend . . .	2
5. Mme. Bertier Rendatler . . .	8	16. Golden Christine . . .	2
6. Prince of Wales . . .	6	16. Mlle. Marthe . . .	2
6. Peter the Great . . .	6	16. Fair Maid of Guernsey . . .	2
6. Elaine . . .	6	16. Venus . . .	2
6. Lady Selborne . . .	6	16. Empress of India . . .	2
10. Jardin des Plantes . . .	5	16. Julie Lagravère . . .	2
10. L'Île des Plaisirs . . .	5	16. Curiosity . . .	2
12. Mrs. Haliburton . . .	4	16. Lord Wolseley . . .	2
12. Roseum superbum . . .	4	16. Margot . . .	2
14. Bouquet Fait . . .	3	16. George Gordon . . .	2
14. James Salter . . .	3	16. Mrs. Sharpe . . .	2

Fifty-five varieties were named by the thirty-three voters in this class. The three small-flowered Incurved kinds show unmistakably their popularity by the great majority of votes accorded them over any other. Although a long way down in the list, Roseum superbum, Prince Alfred, and Lord Wolseley are good for this method of cultivation.

XIX.

THE BEST SIX VARIETIES FOR PYRAMIDS. (27 Voters.)

Those which obtained only one vote are omitted from this table.

	Votes		Votes
1. Mrs. G. Rundle . . .	16	11. White Cedo Nulli . . .	3
2. Mrs. Dixon . . .	11	11. Lady Selborne . . .	3
3. George Glenny . . .	9	11. Margot . . .	3
3. Peter the Great . . .	9	11. John Salter . . .	3
5. Bouquet Fait . . .	7	17. Mlle. Marthe . . .	2
6. Mme. B. Rendatler . . .	5	17. Golden Mlle. Marthe . . .	2
6. Elaine . . .	5	17. L'Île des Plaisirs . . .	2
6. Prince of Wales . . .	5	17. Venus . . .	2
9. Source d'Or . . .	4	17. Jardin des Plantes . . .	2
9. Dr. Sharpe . . .	4	17. Empress of India . . .	2
11. Lilac Cedo Nulli . . .	3	17. Mlle. Lacroix . . .	2
11. Golden Cedo Nulli . . .	3	17. Chevalier Damage . . .	2

As in the preceding class, the small-flowered Incurved varieties stand well to the front, although this form of training is but little practised nowadays. As many as fifty-four were named altogether as being suitable.

XX.

THE BEST THIRTY-SIX VARIETIES OF DWARF GROWTH, ALL SECTIONS. (39 Voters.)

Only those which obtained more than five votes are included in this table.

	Votes		Votes
1. Avalanche	34	31. Lord Eversley	13
1. Princess Teck	34	31. Ralph Brocklebank	13
3. Val d'Andorre	33	35. Fleur Parfaite	12
4. Chevalier Damage	32	35. Sœur Dorothée Souillé	12
5. Barbara	31	37. Mons. H. Jacotot	11
6. Lady Hardinge	29	37. Refulgence	11
7. L'Adorable	27	37. Dr. Sharpe	11
8. Hero of Stoke Newington	25	37. Golden Christine	11
8. Criterion	25	37. Sarah Owen	11
10. Mons. Freeman	24	37. Gloriosum	11
11. Cullingfordii	23	43. Mrs. Cullingford	10
11. Mrs. W. Shipman	23	43. Mlle. Marthe	10
11. Edwin Molyneux	23	43. Peach Christine	10
14. Golden Dragon	22	43. Dr. Macary	10
15. Meg Merrilies	21	47. White Christine	9
15. Mme. de Sevin	21	47. Lady Talfourd	9
15. Mrs. N. Davis	21	49. Duke of Berwick	8
15. Princess Beatrice	21	49. Le Grand	8
19. Mme. Desgrange	20	49. Julie Lagravère	8
20. Mme. J. Laing	19	49. Empress Eugénie	8
21. Triomphe du Nord	17	53. Mons. Astorg	7
22. Mons. W. Holmes	16	53. Sœur Melanie	7
22. Charles Gibson	16	53. Père Delaux	7
22. G. Wernig	16	53. Mrs. Hawkins	7
25. Georges Sand	15	53. King of Crimsons	7
25. Hiver Fleuri	15	58. Fernand Feral	6
27. Mrs. F. Jameson	14	58. Source d'Or	6
27. La Nymphe	14	58. Baron Beust	6
27. Gluck	14	58. Golden Mlle. Marthe	6
27. Fleur de Marie	14	58. Pink Christine	6
31. Mons. H. Elliott	13	58. Alexandre Dufour	6
31. Prince of Anemones	13	58. Lakmé	6

This class is one of great importance as being instructive to the beginner in Chrysanthemum cultivation, especially to those with limited accommodation. The varieties named are those which are naturally of a dwarf habit, not being made so by any method of culture, but simply naturally so, which will be all the more acceptable to those about to make a selection of suitable

kinds. No less a number than 254 were named by the thirty-nine voters; from these sixty-four are selected, any with less than six votes not being noted here.

XXI.

WEAK VARIETIES. (51 Voters.)

Only those which obtained more than four votes are included in this table.

	Votes		Votes
1. Criterion	38	19. Agréments de la Nature	8
1. J. Delaux	38	19. Fleur de Marie	8
3. Princess Beatrice	30	21. Cherub	7
4. Mr. Bunn	25	21. Roi des Japonais	7
5. Balmoreau	24	21. Dr. Sharpe	7
5. Mrs. W. Shipman	24	21. Sir Stafford Carey	7
7. Lady Hardinge	22	21. Thunberg	7
8. Marguerite Marrouch	20	26. Mrs. H. Cannell	6
9. Golden Dragon	17	26. Novelty	6
10. Meg Merrilies	16	26. Mons. Astorg	6
11. Êmpress Eugénie	15	29. Le Sceptre Toulousain	5
11. Barbara	15	29. Beverley	5
11. Mr. R. Brocklebank	15	29. Princess of Wales	5
11. Mons. J. Laing	15	29. Sœur Dorothee Souillé	5
15. Japonais	14	29. Mrs. Mahood	5
16. Mons. Ardène	13	29. Lady Slade	5
17. Martha Harding	11	29. Mlle. Cabrol	5
18. Lady Carey	10		

With a view to assist those who do not know the various sorts which are admittedly weak in their constitution, a class was made for them, so that there might be a general opinion obtained. Two kinds (well known to growers), Criterion and J. Delaux, are bracketed together with thirty-eight votes each, as being the weakest of the 119 varieties named, of which number thirty-five only are noted as having received more than four votes out of the fifty-one voters.

OPINIONS ON THREE SUBJECTS :

Questions asked :—

1. THE MOST SUITABLE COMPOST FOR PARTICULAR DISTRICTS ;
2. THE BEST TIME TO CUT DOWN PLANTS FOR GROUPING PURPOSES ;
3. CAUSE OF DAMPING OF THE BLOOMS, AND REMEDY.

Answers received :—

BERKSHIRE.

W. POPE, Highclere Castle, Newbury.

1. Three parts loam, half-part fresh horse manure, half-part decayed leaves, half-part wood ashes, quarter-part coarse sand, quarter-part charcoal, half-pound Thomson's vine manure to each bushel of soil.

2. Late varieties, third week in May ; other varieties, second week in June.

3. A too free use of stimulants, combined with a cold, damp atmosphere. Remedy : Warm, dry, buoyant atmosphere, and discontinuance of stimulants.

A. STREET, Mount Oak, Enfield Green, Staines.

1. Half yellow loam, half sandy loam, leaf soil, and mushroom-bed manure.

2. Late varieties, end of May ; others, first to third week in June.

3. Excess of stimulants, insufficient ventilation.

T. TURTON, Maiden Erlegh, Reading.

1. Loam, eight parts ; two mushroom-bed manure, one wood ashes, one bushel of hoof parings, and one bushel of soot.

BUCKINGHAMSHIRE.

R. OWEN, Castle Hill, Maidenhead.

1. Loam, leaf soil, lime rubbish, bones, horse manure, and cow ditto.

2. Early in June.

3. Too much stimulant, overcrowding, insufficient ventilation, damp atmosphere, and fire-heat without air.

C. HERRIN, Dropmore, Maidenhead.

1. Fibrous loam and bone dust, soot, small charcoal, leaf mould, horse droppings in small quantities.

2. May.

3. Principally atmospheric moisture. Remedy : Warm air.

DURHAM.

T. B. MORTON, Mowden Nursery, Darlington.

1. Loam in this district very heavy. To one-half add a fourth half-rotten horse manure, one-fourth leaf mould, charcoal, dissolved bones, and Beeson's manure.

2. From May 12 to May 20.

3. A too cold atmosphere. Remedy: A buoyant atmosphere by warming the pipes and admitting air moderately.

ESSEX.

C. J. SIMPSON, St. John's Nursery, Chelmsford.

1. Fibrous loam, leaf mould, mushroom-bed manure ; bones, half-inch, and bone meal ; small quantity of soot.

2. Late varieties, middle of May ; for intermediate varieties, June 1 ; early sorts, end of June.

3. Excess of stimulants in wet weather, or in a cold season. Remedy: Little fire-heat, with moderate amount of air, abundance of night air.

H. LISTER, Easton Lodge, Dunmow.

1. To three barrow-loads turfy loam add one barrow-load of the following in equal parts :—Fine-ground bones, wood ashes, charcoal, sand, pigeon dung, old mortar rubbish, and a little soot.

J. DOUGLAS, Great Gearies, Ilford.

1. Three parts fibrous loam, one part leaf mould, one part decayed manure. To ten parts of this compost add one part of pounded oyster shells ; crock with oyster shells also.

3. A too moist atmosphere. Remedy: Admit air freely by day, warm the pipes, let the heat decline towards night, close the house with a low temperature, avoid moisture on the floor.

HANTS.

J. HORRIL, Havant.

3. Generally caused by moisture in the buds before housing the plants.

H. DURRELL, Hambledon.

1. Five parts rough turfy loam, one part horse manure, half-part cow dung, small portion old mortar to keep the soil open.

2. Late sorts, last week in May; early varieties, first week in June.

3. Excess of stimulants, insufficient space, and air when flowering.

W. SMYTHE, Basing Park, Alton.

1. Two-thirds turfy loam, one-third well-decomposed manure, small quantity of soot and sand, thoroughly incorporated.

2. Early in June.

3. Excess of stimulants.

H. GALE, Gosport.

1. Turf, with a little manure, little charcoal, firm potting, and good drainage.

2. The end of May.

3. Excess of water.

G. TRINDER, Dogmersfield Gardens, Winchfield.

1. No special mixture is required.

3. Too much artificial manure and water.

C. SHENTON, The Glen, Golden Common, Winchester.

1. Two barrow-loads of loam, one of turf-mould, half of rotten manure, half of leaf mould, half of cinders, two or three gallons of sand. To the mixture add 28 lbs. of bone dust, one and a half gallons of Clay's Fertiliser.

3. Excess of stimulants.

E. MOLYNEUX, Swanmore Park, Bishop's Waltham.

1. For the final potting, which is the more important, I advise a different constitution of the quantity of heavy and light turf, as this varies so much in different localities. For heavy loam—three parts, removing the fine soil; one part horse manure, one half of decayed leaves, one part of coarse silver sand, a quarter-part dissolved bones, one part of charcoal and wood ashes, with a 6-inch potful of soot to four bushels of soil. Light loam—four parts, two parts horse manure, one part leaves, half a part coarse sand, same quantity of ground oyster shells, half a part of fine crushed bones, a 6-inch potful of soot to four bushels of soil.

2. Late varieties, from the middle of May; other sorts, about the middle of June.

3. Excess of stimulants when the plants are not thoroughly

well supplied with roots, which may have been destroyed by too strong doses of manures, artificial or otherwise, is the primary cause of damping. Excess of moisture in the atmosphere will also cause the flowers to damp, which is much aggravated if the soil in the pots is kept too wet when the blooms are expanding. Remedy: Less stimulants if the plants are not in good condition to receive it; a buoyant atmosphere caused by judicious ventilation and fire-heat; and only sufficient water to maintain a moist state of the soil.

HEREFORD.

A. HAGGART, Moor Park, Ludlow.

1. Three parts loam, one part half-rotted beech leaves, one part horse droppings, one and a half parts coarse river sand, one of wood ashes, quarter-part ground bones, and a little soot; pots crocked with oyster shells, charcoal, and broken pots.

3. Excess of stimulants main cause, with sudden changes of temperature, combined with a foggy or moist atmosphere. Remedy: Be careful with ammoniacal manures; give plants dry air and a temperature of 40° to 55°.

HERTS.

E. BECKETT, Aldenham House, Elstree.

1. Three parts loam, one part horse manure; to every six bushels add one gallon of bone meal.

3. Excess of stimulants after the buds show colour. Remedy: Check the stimulants, admit air freely, give a little fire-heat.

B. P. PHILLIPS, Ladgrove, New Barnet.

1. One and a half barrow-loads of loam, half of leaf soil, half of rotten dung, half a peck broken oyster shells, quarter peck half-inch bones, half a barrow road drift. Soil here is highly impregnated with iron, which tends to solidify the whole.

2. The third week in May.

3. Excess of artificial manure, too much water at the roots, and insufficient ventilation. Remedy: Abundance of air, avoid draughts, careful application of water when housed, and less stimulants.

G. KING, Glenchess, Loudwater, Rickmansworth.

1. Yellow loam four parts, one part horse manure, a 6-inch

potful of soot to four bushels of loam, 6-inch potful of Clay's Fertiliser, also a few half-inch bones and crushed oyster shells.

2. About the last week in May.

3. High cultivation and damp atmosphere. Remedy: Keep a dry atmosphere and as much air as possible, along with a little fire-heat.

J. KIPLING, Knebworth House, Stevenage.

3. Excess of nitrogenous manures, and too sudden a change from a warm growing temperature through the day to a cold stagnant one through the night after the plants are housed and the blooms well advanced. Prevention: Less stimulants at this stage of the blooming period, a moderately warm, dry, and equable temperature for day and night.

C. COX, Brickendon Grange, Hertford.

3. Wood not sufficiently ripened, and excess of stimulants, are the main causes.

KENT.

D. HILL, Beechboro' Park, Hythe.

1. Nine bushels of loam, four and a half bushels half-decayed leaves, seven gallons fine-ground bones, one gallon dissolved bones, sand, old mortar; no horse or cow manure.

F. MOORE, Blendon Hall, Bexley.

1. Yellow loam, one-third well-rotted farmyard manure, wood ashes, charcoal, and coarse sand, mixed two months previous to using. To one wheelbarrowful of the compost add a 4-inch potful of Thomson's or Clay's Fertiliser; well drain the pots with oyster shells; pot firmly.

2. Second week in May.

H. BRISCOE, Ironsides, Foot's Cray, Kent.

1. Twelve parts loam, three parts of horse manure, three parts leaf mould, three parts coarse sand, a small quantity of charcoal, bone dust, horn shavings, oyster shells, crushed wood ashes, and cocoanut fibre. To every bushel of soil add one ounce of oxide of manganese, and one ounce of gypsum.

3. Excess of stimulants and insufficiency of ventilation when the plants are housed. Remedy: Moderate stimulants, ample ventilation, with dry heat during all weather, dispensing with bottom ventilation during fog or mist.

W. G. GRAY, Sittingbourne.

1. Turf stored three months, one part spent cucumber beds, half-part bone meal, quarter-part mixture of wood ashes, charcoal, and sand.

2. Second week in April, and same time in May.

W. PARKS, Fernside, Bickley.

1. Three parts loam, one part horse manure, a sprinkle of soot and Thomson's manure.

2. From May 18 to June 6, according to variety.

3. Excess of stimulants during wet warm weather; a dry buoyant atmosphere is the best remedy. Crown buds are worst affected.

J. DOUGHTY, Angley Park, Staplehurst.

1. Loam here heavy; use equal parts loam and leaf mould, with a part old mortar. Half hundredweight bone meal to 300 plants. Crock with cinders.

2. Late varieties end of May, early sorts in June.

3. Excess of stimulants during the later development of the buds, combined with a deficient root action consequent on the use of strong liquid manures. The suckers should be allowed to grow when the bud is fully developed.

W. PACKMAN, Foot's Cray.

1. Turfy loam, six parts; fresh horse manure, two parts; leaf mould, one part; fine ground bones, quarter part; dissolved bones, one-sixth part; charcoal, half part; coarse sand, one part; wood ashes, half part; one 32-potful of either Thomson's, Clay's, Jensen's, or Beeson's manures to five bushels of soil, with half the quantity of lime added.

2. Late varieties from May 15 to 18; mid-season sorts, June 1 to 4; early varieties, June 15 to 18.

3. Cause: Over-watering, excessive sudden changes of temperature from day to night, deficient and improper ventilation. Remedy: Tepid water, equable temperature when the plants are housed, not allowing the thermometer to fall below 42 degs., allowing a small portion of air always, with sufficient fire-heat to maintain a temperature of 45 degs. by night.

J. HEWITT, Hythe.

2. Late varieties, May 14; others middle of June.

LANCASHIRE.

T. WINKWORTH, Childwall Hall, Liverpool.

3. Excess of stimulants, especially just before and after housing the plants.

J. A. MERCER, Childwall Hall, Liverpool.

1. Loam, three parts; leaf mould, two parts; cow manure, one part; one part old mortar; one of charcoal, or wood ashes; and a fair sprinkling of bone meal.

2. Middle of May to June 1.

3. Excess of stimulants during mild and damp weather. Remedy: Less stimulants; keep plants drier at the roots when damping occurs.

LEICESTER.

W. R. WOODCOCK, Barkley Road Nurseries, Syston.

1. Two parts loam, which is light; one part manure, fresh, that from stables where moss litter is used; half-part of wood ashes; a small portion of soot.

2. "Topping" the shoots is here practised in preference to cutting down, commencing from the middle of May until the end of June, starting with the late and finishing with the early varieties.

3. Excess of stimulants, as sulphate of ammonia and nitrate of soda, and the condensation of moisture upon the glass. Remedy: Roof-heating to dry up condensed moisture, and less stimulants.

LINCOLN.

W. MITCHELL, The Moorlands, Bracebridge.

1. Turf from an old pasture near a brickfield, which is close and heavy.

2. Commence May 25 with late varieties, finishing June 14 with early sorts.

3. A low, moist night atmosphere. Remedy: A dry atmosphere, especially at night.

MIDDLESEX.

E. CHADWICK, Hanger Hill House, Ealing.

2. Last week in May.

3. Dense fogs are the chief cause of damping. Fire-heat to dry the air the best remedy.

H. NEARY, Holy Innocents' Gardens, Hornsey.

2. Late varieties, May 1; general collection, May 15.

W. DAVEY, Cedar House Gardens, Stamford Hill.

3. Immature state of the wood, and fog. Remedy: Warm the air, and give as much of the latter as possible consistent with the outside conditions.

J. H. WITTY, Nunhead Cemetery.

1. Five parts rough loam, one part well-decayed cow manure, one part partly decayed horse manure, one part coarse silver sand, half-part ground bones, with half a peck of soot.

2. From fourteen to twenty-one days previous to the final shift into the flowering pots. Late-flowering varieties a fortnight before the earlier sorts.

3. Excess of stimulants, or from unsatisfactory atmospheric influences. Remedy: Less of the former, and a free circulation of air about the plants, and under the pots also.

G. LAMPARD, 6 Hogarth Terrace, Chiswick.

1. Two parts loam, one of manure, some half-inch bones, coarse sand, and a little soot.

2. From May 24 until the first week in June.

3. To prevent damping give plenty of air, little fire-heat, and not much water.

W. FURZE, Roselands, Teddington.

1. Three parts loam, one part leaf mould, one part rotten manure, with crushed bones, mixed with lime rubbish and soot.

2. From the latter end of May to second week in June, according to variety.

3. Damp atmosphere and over-watering. Remedy: Paint the pipes with sulphur, which warm, and give good ventilation.

W. CLARK, Eversley Gardens, Herne Hill.

1. Two parts loam, one of leaf soil, and one of mushroom-bed manure.

2. Late varieties commence May 20, finishing at the middle of June with early-flowering sorts.

3. Excess of manures, such as sulphate of ammonia and nitrate of soda, and insufficient ventilation. Remedy: Check gradually the use of stimulants when the buds are showing colour; give a little fire-heat once a week to dry the house.

R. DEAN, Ranelagh Road, Ealing.

1. Loam from an old pasture, four loads, two bushels of soot, half a load old lime rubbish, half a load manure, one hundred-

weight of small bones and a little guano. This mixture would do for about 300 plants.

J. WRIGHT, Middle Temple Gardens.

1. Fibrous loam, rotten dung, and crushed bones.

3. Immature wood and insufficient ventilation are the chief causes of damping. Remedy : Free circulation of warm dry air continually about the blooms.

NORTHAMPTON.

HENRY DUNKLEY, Brookland House Gardens, Market Harborough.

1. Three parts fibrous loam, one part sweetened horse droppings, crushed bones, charcoal, broken oyster shells, good sprinkling of sand, and a little soot.

2. The last week in May and first week in June for late varieties. The second and third week in June for early sorts.

3. Excessive application of stimulants and water at the roots, as well as careless ventilation. Remedy : Abundance of air, top and bottom of house, when weather is favourable, making the pipes warm to dry up moisture, always keeping air on top when heat is used in the pipes.

J. DILLEY, Bowden Hall, Market Harborough.

1. Two bushels strong turf loam, one bushel of road sidings with the fibre in it, one bushel of old mushroom-bed material, one bushel of leaf soil, one peck of sand, 10-inch pot of bone meal, same of charcoal, half bushel of wood ashes, and a 6-inch potful of soot.

2. Late varieties, May 14 ; others from early part to middle of June.

3. Excess of stimulants and dull moist weather. Remedy : Fire-heat with air ; fill open boxes with unslaked lime.

NOTTS.

C. E. PEARSON, Chilwell Nurseries.

1. Three parts turf, one part rotted stable manure, half a part bone dust, wood ashes and soot.

2. Mabel Ward, Eve, and Cherub to be stopped end of April ; Princess Teck, Hero of Stoke Newington, Guernsey Nugget, Gloriosum, Edwin Molyneux, Boule d'Or, Marsa, Val d'Or, and M. N. Davis middle of May ; Queens, Comte de Germiny, Hamlet,

Mr. Garnar, Mlle. Lacroix, Meg Merrilies, Ralph Brocklebank, and J. Delaux, first week in June. The following week, Elaine, James Salter, Lady Selborne, W. Holmes, Val d'Andorre, and Henri Jacotot may be cut down. The above to produce flowers early in November.

G. GROVES, Rangemore Gardens, Burton-on-Trent.

1. Six parts loam, two horse manure, two half-decayed leaves, two sand, one charcoal, one wood ashes, 5-inch potful of soot, and a 5-inch potful of Thomson's vine manure to each barrow of soil.

For weak varieties, three loam, one half-decayed leaves, one mushroom-bed manure, half wood ashes, half sand, half charcoal, 5-inch potful each soot and Thomson's manure.

2. From the last week in April until the end of the second week in June.

3. Overfeeding and improper ventilation.

SOMERSET.

G. WALL DUCK, Chard.

1. Turf nine parts in twelve, or three quarters of the entire quantity; coarse sand and charcoal, one part of each in twelve, and one part of Clay's Fertiliser.

2. First June generally.

3. Excess of stimulants and unripened wood, close atmosphere, insufficient drainage, and over-potting are the main causes. Remedy: Defects named, and in damp weather sprinkle flowers of sulphur on floor and stages.

SURREY.

E. CHERRY, Norfolk House, Streatham.

2. Late-flowering varieties, June 10 to 18; early-flowering sorts, from June 22 to 30.

T. B. HAYWOOD, Woodhatch Lodge, Reigate.

3. The principal cause of damping is a too moist atmosphere, caused by insufficient ventilation, or dense fogs, which are difficult to combat around London. Remedy: Use more fire-heat and a little ventilation at the same time. Damping of the flowers caused by a too free use of stimulants to the roots I do not think can be cured.

C. J. SALTER, Woodhatch Lodge Gardens, Reigate.

3. Same as above.

C. BECKETT, Juniper Hill, Dorking.

3. The chief cause is allowing the opening buds to get wet before housing. Remedy: Afford protection earlier.

W. JUPP, 24 Waldrons, Croydon.

3. Too much atmospheric moisture; by too little air and overcrowding of the plants. Remedy: Paint hot-water pipes with oil and sulphur, sprinkle the latter dry on the floor at housing time, and hot-water pipes under the roof.

J. BUSS, West Hill, Epsom.

1. One-half fibrous loam, one-half leaf mould, well-rotted cow and horse manure in same quantity, plenty of coarse sand; pot firm in well-drained pots.

2. Healthy plants of late sorts, May 20. The remainder during the following three weeks; the early varieties last.

3. Excessive use of manure with bad drainage, and unripened wood. Remedy: Sufficient ventilation to maintain a buoyant atmosphere by warming the hot-water pipes. Never allow cross currents of air on foggy days.

W. MEASE, Downside, Leatherhead.

1. First potting, two parts loam, one part leaf mould, with a little sand. Final potting, two parts loam, one part leaf mould, one part horse droppings, half a part lime rubbish and wood ashes.

2. The first week in June.

J. WESTON, South Road, Clapham Park.

1. Seven-eighths yellow loam and Mitcham loam in equal parts, one-eighth leaf mould and rotten manure, with a sprinkle of silver sand, fine oyster shell and bone meal. Mitcham loam is very light and turfy.

2. Japanese varieties from May 28, and June 7 beginning with the late sorts. Incurved are not cut down.

3. Excess of stimulants, with a too close air, are the main causes of damping.

H. ELLIOTT, Leyden House Gardens, Mortlake.

1. Three parts fibrous loam, one of horse manure, one of coarse sand, a good sprinkling of half-inch bones and charcoal, a little soot, and the pots crocked with bones.

2. June 1.

3. Sulphate of ammonia, where used, is the main cause.

J. BROWN, Great Doods, Reigate.

1. Loam and rotten manure, with a little sand.

2. About May 24.

3. Atmospheric moisture, caused mainly by standing the plants too thickly together on the ground. Make the air dry by the use of fire-heat.

C. PAGE, Highams, Bagshot.

1. Fibrous loam three parts, one part horse droppings, half-part coarse sand, same of charcoal, one 32-sized potful of ground bones to one barrowful of soil.

2. Last week in May.

3. Excess of stimulants and atmospheric moisture. Remedy : Cease the use of stimulants when blooms are quarter expanded, give fire-heat at night when foggy or wet, with air top and bottom of the house.

W. HOWE, Park Hill, Streatham Common.

1. To four barrow-loads of loam add one of horse droppings, one 16-size potful of soot, the same quantity of bone dust or Clay's Fertiliser. Mix well together and pot firmly.

2. Second week in June.

3. Atmospheric moisture and the prevalence of green-fly ; avoid the former by the use of fire-heat and liberal ventilation, the latter by fumigating with tobacco paper.

J. LYNE, Wimbledon.

1. Turfy loam, two parts horse droppings, one part with crushed bones, and oyster shell added.

2. From June 1 to June 10 late varieties.

3. Excessive use of ammonia in feeding the plants, damp atmosphere, and overcrowding of the plants after housing are the chief causes.

R. BRADFORD, Wimbledon.

1. Three parts turfy loam, one of leaf soil, and sand for the cuttings. For final potting, three parts loam, two of horse droppings, one of half-rotten leaves, half-part coarse silver sand, half-part bone meal, the same quantity of charcoal, and a 6-inch potful of soot to every barrowful of soil ; use all in a rough state.

2. Late varieties early in May ; others end of month.

3. Excess of stimulants is the main cause. When the buds commence to unfold, cease the supply of liquid manure ; give only soft water afterwards, and this only in small quantities.

G. SPRINGTHORPE, Gifford House Gardens, Roehampton.

1. Two-eighths each strong loam and horse manure, one-

eighth wood ashes, same quantity oyster shells, with sufficient river sand to make the whole porous.

2. "Top" late varieties middle of May; early sorts first week in June.

3. Excessive use of stimulants and moisture after the flowers show colour. Remedy: Buoyant atmosphere, with weaker stimulants.

E. BERRY, Roehampton House.

1. Good loam, road sand if gully, some quarter-inch bones, one-sixth part of decayed manure, one-eighth part of earth-closet mould to the above.

2. Early in June.

3. Excess of stimulants and atmospheric moisture. Remedy: Check both, employ fire-heat.

CHARLES GIBSON, Morden Park, Mitcham.

1. Six barrow-loads light yellow loam, two stiff loam, one and a half leaf mould, one and a half cow dung, one and a half coarse sand. To the above add one $4\frac{1}{2}$ -inch potful of soot, and same quantity of bone dust to each barrow of soil.

3. Exposure of buds too long outside when they commence to unfold, scalding of the blooms by the sun after dull weather, too much atmospheric moisture, too liberal ventilation in stormy or foggy weather, bad drainage, and excess of stimulants. Remedy: Earlier removal under cover, shade in bright weather, careful ventilation, with fire-heat in moderation.

H. SHOESMITH, Shirley, Croydon.

1. Three pounds bone meal to one bushel of light yellow loam, with a liberal quantity of charcoal added.

3. Excessive use of stimulants, such as sulphate of ammonia; fogs and atmospheric moisture, sun blistering many blooms after dull weather. Avoid these defects by less stimulants, more air judiciously applied, fire-heat, and shade.

JAMES QUARTERMAN, Silvermere, Cobham.

1. Four parts of loam, one part of stable manure, one part cow manure, one of wood ashes, small quantity of lime phosphate, and chicken manure.

3. Too vigorous a growth. Plenty of fresh air is the best remedy.

G. WANSER, Wimbledon.

1. Turf, sand, old mushroom-bed manure, leaf mould, charcoal, and bones.

3. Excess of manure, unripe wood, moist, foggy atmosphere.
Remedy: Less stimulants, warm, dry air, with liberal ventilation.

SUSSEX.

JAMES HOPKINS, High Cross Gardens, Framfield.

1. Two-thirds heavy turfy loam, one-third leaf soil, and prepared horse droppings, with a liberal quantity of sharp sand.

3. Too close and damp atmosphere after the plants are housed.

CHARLES FOWLER, Barrow Hill, Henfield.

1. One-year-old fibrous loam, two parts; spent mushroom-bed manure, one part; leaf mould, one part; and a pint of bone meal to a bushel of the compost.

2. First week in June.

3. Excessive use of stimulants, with too much pot room.

Remedy: Ventilation night and day, with the aid of fire-heat.

M. RUSSELL, Henfield.

1. Three parts moderately light loam, with plenty of fibre, one part rotted horse droppings, one gallon of soot to four bushels of soil.

2. May 20 for late sorts; June 1 for others.

3. Atmospheric moisture is the great cause; if fire-heat is judiciously applied, and liberal ventilation given, damping may be avoided.

F. GODBY, The Oaks, Burgess Hill.

1. Loam, horse droppings (not too rotten), with a small addition of leaf soil, soot, and bone dust.

2. From the middle of May to the middle of June.

3. Excessive feeding to plants, with little foliage. Remedy: More blooms, and consequently more foliage to each plant; arrange plants thinly in the house; give air front and back, with fire-heat, and not too free a use of the water-can.

WILTS.

H. W. WARD, Longford Castle, Salisbury.

1. Three parts yellow calcareous loam, a good sprinkling of drift sand or small charcoal, and a handful or two of fresh soot to each barrowful of the mixture, thoroughly mixed.

3. Plants kept too wet at the roots; a humid, close, and low atmospheric temperature. Remedy: A thorough state at the roots, neither wet nor dry; a buoyant atmosphere caused by artificial heat.

J. HORSEFIELD, Heytesbury.

1. Four parts sandy loam, one horse droppings, one leaf

mould, with a slight addition at the final potting of bone meal and wood ashes.

3. Insufficient ventilation after the plants are housed; avoid this by maintaining a buoyant air.

G. INGLEFIELD, Tedworth House, Marlborough.

3. Over-feeding at certain stages, and damp, foggy weather, through a want of maintaining a buoyant atmosphere by artificial means.

WORCESTER.

W. CRAMP, Madresfield Court, Malvern.

1. Three parts old turfy loam, one mushroom-bed dung, one fine lime rubble, and one sharp river sand, fine bones, and soot.

3. Over-feeding, too much water, or a stagnant atmosphere. Prevention: Thorough drainage; the use of smaller pots for varieties known to be susceptible to damp more than others; the maintenance of a gentle circulation of air in the house by artificial means.

YORKSHIRE.

F. R. HAYES, Woodville Gardens, Keighley.

1. Three parts good fibrous loam, one good stable manure, mixed with plenty of sand, one 8-inch potful of ground bones, and the same quantity of charcoal to each barrowful of soil.

2. Late varieties, April 6; medium flowering sorts, May 1; the early varieties, such as Mrs. G. Rundle, May 12.

3. A too close atmosphere; maintain a buoyant air by artificial means, applying fire-heat at the time air is given.

THOMAS BARCLAY, Beechcliff Gardens, Keighley.

1. Fibrous turf, leaf mould, rotten manure, a 6-inch potful of crushed bones to one wheelbarrowful of the compost, with a good sprinkling of sand and soot, thoroughly mixed.

2. Late varieties, April 1; early sorts, May 6.

3. Too wet a condition of the roots when the flowers are expanding, and damp weather, cause too much atmospheric moisture, which should be remedied by artificial means.

M. MIDGLEY, Bankfield Gardens, Bingley.

2. May 5 is the best time to cut down plants in this neighbourhood.

SCOTLAND.

A. DEWAR, Palace Gardens, Falkland, Fife.

1. Turfy loam, pigeon manure, bone meal, soot and sand added.

JOURNAL

OF THE

ROYAL HORTICULTURAL SOCIETY.

A METHOD OF WINTER GARDENING.

By the Rev. W. WILKS, M.A., Sec. R.H.S.

[Read Jan. 14, 1890.]

I AM quite sure that when you first saw my name announced as going to give you a lecture this afternoon there rose up in the minds of many of you the adage, "Fools rush in where angels fear to tread." But, indeed, it is not so. I have done myself violence in presenting myself before you in this novel character of lecturer. I have metaphorically taken myself by the scruff of the neck and dragged myself to the front. And, first, I will tell you how it all came about. It has seemed good to the Council this year that there should be a lecture, if possible, on every one of the afternoon meetings, not because hitherto our audience has been so large, but in the hope that when the regularity of these lectures, and the intrinsic value and interest-ingness of all except this first one, became better known through the medium of the Society's Journal, so, gradually, the attendance of Fellows of the Society to hear them would increase. Such being the case, I was instructed to invite two gentlemen, one living in Cheshire, and the other in the Isle of Wight, to speak to you this afternoon of Christmas Roses—*Helleborus niger* and its varieties. Well, I frankly confess that I shrank from writing those two letters, and "with honeyed words in-veigling" those two gentlemen to leave their own firesides in such weather as we may reasonably expect in January, to lecture to so small an audience as we may reasonably expect to have in such weather. I sat with the note-paper before me, pen in hand. I got as far as "My dear Sir," and then the thought of possibly cold slushy snow, or of a biting cold east wind, or of a dense dark fog, and of this scantily filled hall in

mid-January, came over me and I could not do the deed ; I took my orders, but put in my own name instead, and I am thankful to say that at the next meeting of the Council, when I confessed my wickedness, I received the most complete forgiveness. And so, instead of the old adage which came into your minds, I would suggest as applicable to the present case the doggerel :

The good-natured fool lets himself be dragged in,
When to use up an angel would be a great sin.

And having thus dragged myself in, I had to fix upon a subject ; and so I began to think over the wide scope—the many-sidedness—of our old Society. I pictured to myself how one of its many duties lay with what I may call the aristocracy of gardeners—the men, I mean, who have vast ranges of glass houses at their command, and ample funds to keep them up ; how amongst them the Society should encourage the gathering together of all the spoils of the tropics for the delight and recreation and instruction of untravelled folk ; and then, with a tremendous bound, my thoughts passed over to the humble dwellers in our cottages in the country, and in flats and rooms in towns, in whom our Society does all that it can to encourage a love of plants, by granting medals to be competed for in their local window-gardening and cottage gardeners' societies, and by drawing attention to the easier grown hardy flowers and improved varieties of common fruits and vegetables. But between these two classes lies the great middle class, some of whom are so worthily engaged in extending the fruit culture of this country, and for whom our Society has made so many practical experiments, and has recently held congresses on fruits and vegetables, and the vast majority of whom are, like myself, enthusiastic in their love of gardening, but have little time and less money to devote to their favourite pursuit, and who, consequently, want to secure the best possible results at the smallest possible outlay. To these last, then, I determined to say a word in season if I could, because I know by everyday experience that the pleasure-gardens of a very large number of the middle class of amateur gardeners like myself, and some that have not the similar excuse of want of funds, are wont to present a most unattractive, almost melancholy, spectacle from the middle of October to almost the end of March. I determined,

therefore, to draw the attention of the Fellows to a very inexpensive but most effective system of winter gardening which I myself have practised now for some years past, whereby, to a real lover of plants, my garden is almost as pretty, interesting, and attractive in winter as it is in the height of summer.

I will premise that my little vicarage garden consists almost entirely of borders—wide borders—full, or fairly full, of hardy herbaceous plants and bulbs, and so on. I do not much affect beds—at least my liking for them varies in inverse proportion according to whether they are indoors or out—a good proportion indoors, but only a small one here and there outdoors. A good expanse of bright green grass, shaded with one or two large trees, and dotted about haphazard (or rather with the artfulness that conceals the art) with shrubs and large-growing herbaceous plants, like the Acanthuses, the Rhubarbs, and the Fennels, and good clumps of Pampas Grass, the Bamboos, *Arundo conspicua*, and such like, and then the whole surrounded by wide borders, some sunny and some shady, and all backed up with shrubs such as Rhododendrons, Kalnias, Bays, Azaleas, Portugal Laurels, Lilacs, Philadelphus (commonly known as Syringas), Laurustinus, Weigelias, Hollies, and so on, that is my idea of a good, serviceable English pleasure-garden; a garden with abundant variety of form and colour, of flower and foliage; a garden in which every day finds something fresh to look at, to admire, and watch; a garden where every step brings variety, and every season its own especial charm; a garden not only to take pleasure in, but to be itself the pleasure.

Well, you will all agree that in such a garden as I have faintly sketched, spring with its Snowdrops and Anemones, its Primroses and Violets, its nodding blue and white Wood Hyacinths, its Daffodils and Tulips, and its Apple-blossom, and a thousand other of a hardy garden's glories—spring is, and must be, charming. Who can attempt to describe the summer-garden, with its Irises and its Foxgloves, its Pæonies and its Carnations, its innumerable bell-flowers, and, chief of all, its Roses? Summer is always charming. And so is autumn, with its wealth of colour: its Dahlias—yes, I am very fond of Dahlias, double and single, pompon and cactus, I would fain have them all—and its Sunflowers, and its Michaelmas Daisies and Chrysanthemums; and then the leaf-glory of the ripening trees,

and the deciduous shrubs—oh! autumn is very lovely. But how about the winter? Well, some devotees of hardy gardening tell us to leave all the old stalks and decaying foliage, and to rejoice therein. Now I yield to none in my admiration of the colours and forms of leafless but living twigs and branches in the winter: the yellow and almost crimson of some of the Willows; the claret-plum colour some of the Plum bark gathers; the silver snow of the Birch, surmounted by the falling spray of its delicate claret-coloured twigs; the bright yellowy-red russet of the Scotch Firs and Larches; the grey-dove colour of the Oak trunks, the twigs all covered with glaucous haze, through which the rosy nut-brown of the bark or skin gleams out; the exquisite harmony of colour in the lichen-and-moss-bearing gnarled branches and gouty-looking branchlets of old Apple-trees, and so on; but I can see no beauty in the absolutely dead stalks of Lilies, Phloxes, Pæonies, Sunflowers, Michaelmas Daisies, Chrysanthemums, and such things. I seem to see in the one class of colour the evidence of suspended but existing life, and in the other the presence of death and decay and gloom. True, one knows the rootstocks are all living (at least if the slugs are sleeping), but these dead memorials of a past summer's glory can never to my mind be things of beauty, and are better removed to the rubbish heap and the whole garden tidied, as soon as the leaves have fallen. Indeed, I believe it better for the plants to do this. The decaying stalks of Lilies, *e.g.*, form the most convenient and toothsome highways for slugs, caseworms, the larvæ of cockchafer, and such like, to the dormant bulbs beneath; and in other cases the old stems accumulate leaves over and round the rootstocks, and by thus harbouring and attracting slugs and damp do, in my opinion, far more harm than the slight protection they afford from frost does good. So I always have a clean sweep made as soon as ever the sap has thoroughly gone down and the stalks are dead and the leaves fallen. But this leaves the borders absolutely, or almost absolutely, bare from the box or turf edgings to the background of shrubs or trees. The problem is how, at a small outlay of money, time, and labour—and this is a most important item—to make these borders as pretty and interesting in winter as they have been in summer. The answer to the problem can be stated in four words. *Evergreen plants in pots.* It is easily spoken, but it takes a longish time to work out satisfactorily. Of

course, with unlimited funds at your command, it is easy enough to order so many dozen shrubs, set three or four skilled men to prepare the best possible compost, and, hey presto! the thing is done. But I am not intending to address people with ample funds, but that great mass of middle-class folk whose balance at the bankers' is, like my own, constantly nearing the edge, and as to which a very little more expenditure upon the garden would soon bring a little note from Coutts's, most courteously expressed, "drawing your kind attention to the fact"—the horrid fact of "overdrawn." For such people, I say, it takes a longish time to get up a good stock of evergreens in pots.

Someone will say, But why in pots at all? Because the pot system is far more economical in the long run and gives much better results. If evergreen shrubs are moved from the nursery to the garden, and from the garden to the nursery—two movings every year—you must expect every now and again to lose some of the plants—at least that is my own experience; whereas with the pot system I have never known but one to die. Again, evergreen shrubs of any size, moved thus twice a year, in a very short time put on a poor, thin, draggletailed appearance and get leggy, and always remind me of those poor, thin, bent-kneed beggars you see slouching along the streets with torn trouser-ends and ragged coat-tails with bits of the lining hanging down, and their hats brushed three-quarters the wrong way, and out at elbows; whereas with the pot system your plants are feathered down to the very ground, full, robust, and hearty, reminding you of chubby, rosy-faced country urchins, stiff and sturdy, amply fed and amply clothed, and merry from toes to nose. Therefore I say if you want really good plants, plants to be proud of, plants to love, and cannot afford to buy a fresh stock every three or four years, try the pot plan, which I will now endeavour to unfold.

And the first question, of course, is, *When to begin*. Buy such plants as you must buy in March or in September. These, too, I find the best months for making cuttings of evergreens; the March ones must be put in a dampish place, the September ones in a half-shady spot. Almost all evergreens will grow from cuttings with a little care and persuasion; but if not, there is nothing more interesting than growing them from seed. In two to three years' time they will be pretty little dots, just suited for

front places in your borders, and you may grow them thus gradually on for, I fully believe, twenty or thirty years before they will have outgrown your powers of management.

Next, *What plants to get or raise.* It would almost be easier to say what *not* to get, but I will give you a list of what I have found most suitable. But first let me say, do not begin with too big plants; be content to wait for them to grow big. I have plants now in pots—Laurels 5 feet high and 5 feet through, Aucubas 4 feet by 5 feet, Lawsonianas 6 and 7 feet high, and so on; but they have all been gradually grown on. If you begin with too big plants, they almost invariably lose their lower branches and get leggy—I don't know why they do so, but they do—whereas if you begin with little fellows, a foot or 18 inches high, you can keep them for, I am confident, twenty, thirty, or, I shouldn't wonder, for even fifty years in pots, and feathered down to the very ground. It wants just a little management and care, but I am sure it can be done.

Well, the most useful plant I know of for the purpose is Lawson's Cypress. It is a charming plant, so various that almost every seedling raised is unlike its brethren. Go into any good nursery in mid-August and ask for the Lawsoniana quarter, and you will see rows upon rows of dainty little fellows, 8 inches or a foot high or so, some close-growing, some spreading, some tapering, some few with a golden gleam upon the green, some a dull dead-coloured green, some with a shining brownish almost metallic lustre, and some—the loveliest of all—with a pale bluey white glaucous hue upon the foliage, and with bright red stems. Oh, how I revel in such quarters of plant children! The only drawback is, I always want to carry off far more than my nursery—garden, I mean—could possibly contain. Well, you may have your pick of all these little ones at about 5s. or so a dozen, according to their size and age. Do not pick out all the prettiest. No, you want some of the duller ones as contrasts to the bright; some of the plain green to set off the glaucous and the golden ones. Indeed, in all your choosing bear in mind that variety of foliage, form, and habit is what you really want, and not all of the most rare, or even all of the most beautiful. A boy who had nothing but plum-pudding for dinner all the Christmas holidays would loathe plum-pudding soon. It is the contrast with the ordinary staple of the dinner which makes plum-pudding so

toothsome to the boyish palate ; and it is this same contrast with the more ordinary things of life and nature which charms our sense and appreciation of the beautiful. I often think gardens and greenhouses are too full of rarities, and that if a little less had been spent on the plants a far better effect would have been obtained.

But I am wandering. Well, get two or three dozen of these varying baby Lawson Cypresses, and you will have made a thoroughly good beginning for making your borders beautiful in winter. Then you will want other common things (but all small to begin with), most of which you can raise yourself : common Laurel—the broad-leaved variety is the best for contrast—common Portugals, common Yews, a few—just one or two—common and variegated Box. Box is not by any means a favourite with me ; it smells, to my mind, abominable, and is very gloomy ; still, one or two will make variety. There is a very broad-leaved and short-jointed sort of Box I remember seeing years ago, but which I have not yet been able to get hold of, but it would be a great acquisition, and I should be grateful to anyone who would tell me its proper name and where to find it. Perhaps the most generally useful plant, after Lawson's Cypress, is the common female Aucuba. You can hardly have too much of it. It is good in all stages, from the baby with only her six or eight mottled leaves, in the foreground, to the big spreading bush 4 feet high by 5 or 6 feet through, to fill a big gap in the middle of your border. It adapts itself most perfectly to pot culture. Then there are all the Ivies, green, silver, and golden, and some kinds which take on the exquisite crimson and yellow-brown tints more readily than others ; all of them are useful, and with care—but mark this well, Ivies *do* want care and attention to train them into nice pot-plants—but, with careful training, they make charming specimens. The best, I fancy, is the great heart-shaped leaved one which I know under the name of " Algerian " Ivy, though I am doubtful whether it is that variety or *dentata*, or Rægner's, but all three are good.

Having thus made up a good stock of these and many other common things which will at once occur to you—*Berberis Aquifolium* and *Retinospora plumosa*, for example—you must begin to think about laying in your gems, the little beauties which are to attract the chief attention in your borders, like the diamonds

and amethysts and rubies in a jewel. And first of all you must have one or two specimens of *Retinospora obtusa nana*, a shrub on which the light and shade glints more artistically than on any other plant I know. It is quite perfect, with its soft, flat, spreading branchlets. Then, amongst the other Retinoporas, there are *plumosa aurea*, *obtusa aurea*, *obtusa gracilis aurea*, and *pisifera aurea*, all with a charming golden hue upon them; *R. ericoides*, with a claret-brown mossy appearance; and *R. leptoclada*, a dark purplish green, and one of the most quaint, old-fashioned looking and slow-growing shrubs possible. Amongst the Cypresses there is also *pyramidalis alba*, a very pretty feathery and slightly variegated shrub; *Lawsoniana aurea*, by far out and away the best golden shrub I have yet met with; *L. nana*, a perfect little ball of vivid green, and of very slow and stunted, but most healthy-looking, growth; and *L. argentea*, with a most lovely weeping habit. These I fancy are the best. *Thujaopsis compacta* is another charmingly soft-looking, feathery plant, much in the same way as the last-named Cypress. I pass on to the Hollies; and amongst the common green many varieties will at once be seen in any nursery plantation raised from seed, varying in colour from bright green to almost black, and some with a bronzy hue upon them, varying also not inconsiderably in the breadth of the individual leaves. Here, again, as with the Lawson's Cypress, make a good selection of all sorts. Amongst the variegated Hollies there stand out pre-eminently Golden Queen and Silver Queen, the leaves of which are perfect pictures in themselves, but Waterer's Golden I find of better and more compact growth, though not quite so beautiful; you must have all three. Then there are *Ilex myrtifolia* and *laurifolia*, both with leaves of most vivid, shining green, and Hodgkin's and Shepherd's Hollies, both with magnificently broad and almost black-green leaves; none must be missing. *Osmanthus ilicifolius* must by no means be omitted. It is of slow and compact growth, and some of its varieties have leaves of a most glorious bronzy purple colour, and shine with a perfectly metallic lustre, like brown steel. The Golden Yew makes a very fine pot plant, and so does the Irish—better, indeed, than the common Yew does. There is one plant which I like very much, but have left till last because I am told that it is not frost-proof, and this obviously is a *sine qua non* in winter gardening; but with me it has stood

and flourished during five winters, which have sufficed to kill down to the root the common as well as the variegated *Euonymus japonicus*, so that I think you may rely upon its hardiness, south of the Thames at least. It is *Elæagnus japonicus variegatus*; it has lovely olive-green leaves, edged and blotched with a rich cream colour, and the wood part of the shoots is thickly clothed with rich chocolate-brown hairs or scales; altogether, I think it a delightful plant to have just one or two specimens of. There is no suggestion of disease in its variegation, a fault which, to my mind, utterly ruins so many variegated plants. Time would fail me to tell of Rhododendrons, Andromedas and Kalmias, Bays and Laurustinus, the Chinese Juniper, *Thujaopsis borealis*, and many others, all of which do excellently for pot culture, and may be had at very little cost.

Hitherto I have only incidentally remarked that small specimens, especially baby Aucubas and small *Berberis Aquifolium* in tiny pots, do well for the front row; but there are a few excellent things that do permanently for front places. Amongst these the two best plants by far I know of (and both are propagated with the greatest ease, the first from layerings, the second from spores) are *Erica herbacea carnea*, with its soft mossy cushions smothered with bright pink flowers in February and March, and the Shield Fern (*Polystichum aculeatum*), with its long graceful leaves swaying with every wind; of these you cannot have too many. One or two of the white variety of *E. herbacea* are very useful for variety, and the flowers are charming in mid-winter. *Gaultheria Shallon* makes a good pot plant for midway between the front and second rows; so, too, do the varieties of *Menziesia polifolia*, or Irish Heath; but the white one is the only one whose flowers I care for, and they are charming, but I am not sure that the plant is always frost-proof. The common Hart's Tongue Fern (*Scolopendrium vulgare*) I use a great deal of for quite the front, but it is not altogether satisfactory, as an early wet frost is apt to take the colour in blotches out of its glorious broad green leaves. *Arabis albida*, *Iberis corifolia*, and such like, serve for a pleasant change, and Christmas Roses in pots are ever welcome. I do not mention Snowdrops, Crocuses, Daffodils, &c., as they belong more to the subject of spring than of winter gardening.

And now a word or two as to culture, &c. The plants, having been procured, are potted into the smallest-sized pots

they will conveniently go into, and in the end of October, when frost has reduced the Dahlias, &c., to pulp, they are plunged very carefully in between the Pæonies, perennial Sunflowers, Irises, Phloxes, Spiræas, Asters, and other herbaceous rootstocks. Great care is taken in plunging; we rather leave a gap than injure in the smallest degree a stool of any good hardy plant; but where the Dahlias, Paris Daisies, Calceolarias, Geraniums, and such like come out, and where the annuals have been, there is always room. When the plunging is done the borders are again very carefully forked over, about 2 inches deep, and all is tidied up "ere the winter storms begin," and the result is, I venture to say, as delightful a winter border as English eye could expect to look upon. In the middle or end of April, according to the season, the borders are again all cleared, the plants being carried straight to the potting-shed to be repotted. In the matter of compost, I again, as in all else, study economy most strictly. I grow a great many Chrysanthemums and fruit trees in pots. These, as everyone knows, are obliged to be repotted every year in rich soil full of crushed bones, &c., and are kept during their growing time constantly saturated with liquid manures of various kinds. The soil, when they are repotted, is very far from being entirely exhausted, and is at once made up into a heap, to be saved for the shrub-potting in the spring. In this way the compost for the shrubs costs nothing. It is like the outgrown clothes of the elder children being made up again for the younger, and I can answer for it that the shrubs do excellently in this soil. The plants are taken out of their pots, the pots washed and dried, and clean drainage given. The roots are shaken out entirely, as much old soil as possible removed, any long coarse roots shortened back, and then they are repotted, ramming the soil in firmly as you do for fruit trees or Chrysanthemums; and very seldom does a plant, when once of a fair size, require a larger pot than that out of which it came. When the potting is over we go carefully through all the plants and prune them. This, of course, must be done with judgment; but, as a general rule, I remove all long coarse growth entirely, shorten down the *thin* shoots, and head back the leaders, encouraging side and bottom growth as against running up in the head. The pots are then stood back in rows according to size, in some convenient spot not too shady, but not exposed to

baking, scorching sun ; the chief point, however, is that the place where they are stood shall be within reach of the water-hose, and there they stand and go on quietly until October comes again, and then—*da capo*.

I ought perhaps to have said that the *Ericas*, *Kalmias*, *Andromedas*, and such like have some of the old waste peat from greenhouse *Azaleas*, *Camellias*, &c., mixed in with their compost. And note, that where the Holly maggot abounds (and where does it not ?), there you must look your Hollies over most carefully once a week in May and June, or you will soon have no Hollies left. The slight check which the late potting gives them seems to make them less able to resist the maggot, or perhaps makes them sweeter, tenderer, and more juicy to its taste.*

I will not again apologise for having inflicted myself upon you. My only reason was to keep better material for a more promising occasion ; and as for my subject, though great gardeners, who have such an expanse of pleasure-ground that they are glad to devote a portion permanently to a shrub garden, may think it not worth the trouble, little ones, who have to make a small patch fulfil all purposes, may perhaps be thus introduced to a method of winter gardening which, whilst it answers practically to perfection, is at the same time most economical ; and great and little gardeners will, I think, alike allow that the method is not a very hackneyed one ; indeed, I doubt whether they can point to any other garden in the kingdom where it is precisely similarly carried out as it is at my little country vicarage in Surrey.

THE HIPPEASTRUM (AMARYLLIS).

By Mr. HARRY VEITCH, F.R.H.S., F.L.S.

[Read March 11, 1890.]

IN making the following remarks on the *Amaryllis*, I wish to commence by saying that it is not my province to deal with the botanical so much as with the practical side of the subject. For

* Since this paper was written, I have fancied that perhaps Hollies would do better if only repotted every alternate year, and I am giving the idea a trial.—W. W.

botanical information on this most interesting class of plants I cannot do better than refer you to the "Classification of the Species of *Hippeastrum*," by Mr. J. G. Baker, in the *Journal of Botany* for 1878, page 79, and to a "Lecture on the *Amaryllis*," given before the Royal Horticultural Society on March 27, 1883, by Mr. Shirley Hibberd, the substance of which was published in the *Gardeners' Chronicle* of March 31 following. But on the very threshold of the subject that is to occupy our attention to-day I am met by a question of nomenclature that cannot be ignored. Are we wrong in continuing to call these grand flowers after the name of the Virgilian nymph, and should we therefore drop the pleasing appellative with which they have been almost indissolubly connected from our earliest memory, and substitute the rougher *Hippeastrum* for the softer *Amaryllis*? I do not propose to travel over ground already familiar to many of you further than is necessary for the sake of clearness, but it does seem desirable that the question should be impartially considered from a horticultural standpoint, with a view of setting at rest some uncertainty still prevailing on the subject.

The following short retrospect will, I trust, bring the matter clearly before you. Linnæus selected the name of the Virgilian nymph *Amaryllis*—

Tu, Tityre, lentus in umbra,
Formosam resonare doces *Amaryllida* sylvas —

for the lovely South African *Belladonna* Lily; and when, subsequently, bulbs from the West Indies and South America were brought to Europe, and were found to produce flowers closely resembling in form that of the Cape *Belladonna*, they were brought under the same genus. It is interesting, nay useful, to look back sometimes into the distant past, both of science and horticulture, if we wish to measure the strides that have been made in both up to our own times. The *Amaryllis* affords a striking example of what has been done. Not only were many species now referred to *Hippeastrum* figured and described by the older botanists as *Amaryllises*, but also a number of others since separated under various generic designations as *Vallota*, *Griffinia*, *Sprekelia*, *Lycoris*, &c. These were all called *Amaryllis* pretty much after the same manner as all epiphytal Orchids were called *Epidendrums* in the days of our great-grandfathers.

The beauty of the Amaryllids could scarcely fail to attract the attention of amateurs. I use the word Amaryllids in the broader sense of including any plants belonging to the Natural Order of which *Amaryllis Belladonna* supplied the type, under whatever generic name they may be at present known. The facility with which the bulbs could be imported alive, even in the age prior to steam navigation, created for them a demand that could be supplied without much risk; and in the first decades of the present century collections of exotic plants from the far East and from the far West consisted chiefly of bulbous plants and Orchids. Among the amateur collections of Amaryllids formed at the beginning of this century, that of Mr. Griffin at South Lambeth seems to have been exceptionally well cared for and rich in species; the name of the owner is kept in remembrance by the genus *Griffinia*. Another collection, formed by a clergyman at Spofforth, in Yorkshire, was destined to become famous throughout the world by reason of the series of important results, both to science and to horticulture, achieved by the untiring zeal and energy of its owner, who minutely studied, assiduously cultivated, and experimented upon every species of his favourite family he could procure. This was that good old Churchman, Dean Herbert, who published the results of his investigations from time to time in the *Botanical Magazine*, the *Botanical Register*, and the *Transactions* of the Horticultural Society of London. Dean Herbert not only cultivated his bulbs for the sake of their flowers, but he seeded them, crossed and intercrossed them, and even fertilised species with their own pollen as well as with the pollen of other species; in fact, he varied the circumstances in every possible way, making discoveries so remarkable and so unexpected that in that pre-Darwinian age, when the operations of Nature were often imperfectly interpreted, and even wrongly interpreted, the good clergyman incurred no small amount of reproach for promulgating facts and deducing inferences from them that were far in advance of the prevailing notions of his time.

Herbert seeded the Belladonna Lily; he also seeded the American Amaryllises, and found, as we or anyone else may find, that the seeds of the latter differ essentially from those of the former, for while the seeds of the Belladonna are few in number, large and bulb-shaped like those of a *Crinum* or a *Clivia* (Iman-

tophyllum), those of the American Amaryllises are numerous, flattened, and have a dark-coloured skin like those of a *Pancreatium* or *Zephyranthes*. He, however, discovered more than this, for after several trials he found that the Cape Belladonna would not cross with the American Amaryllises, a fact that we have ourselves demonstrated experimentally. On these grounds, but technically on the characters of the seeds only, Herbert separated the American from the South African species, retaining the Linnæan name *Amaryllis* for the latter, which is monotypic, and founding for the former a new genus, which he called *Hippeastrum*, or the Knight's Star-Lily, following the idea which suggested the name *equestre* for one of the species.

Herbert's new genus was not immediately accepted by the most eminent systematists of his time. Dr. Lindley, during his editorship of the *Botanical Register*, declined to recognise it, but admitted it some years later into his "Vegetable Kingdom." Endlicher did not adopt it in his "Genera," published in 1841, nor in the later editions. And, lastly, when we introduced *pardina* from Peru through Pearce, and on the occasion of its first flowering it was figured in the *Botanical Magazine* (tab. 5655), Sir J. D. Hooker wrote: "The genus *Hippeastrum* of Herbert, which includes many American species of *Amaryllis*, differs from the South African type by such very slight and variable characters that it cannot be regarded as of any practical value, and I therefore follow Endlicher in regarding it, together with its allies *Zephyranthes*, *Nerine*, *Vallota*, &c., as sections of the great and widely diffused and very natural genus *Amaryllis*." Now Mr. Shirley Hibberd, when discussing this question before the Society on March 27, 1883, said: "In the *Botanical Magazine* it was an *Amaryllis* (using the word in a collective sense) for a period of about 30 years; then it became a *Hippeastrum* for a period of 45 years; but, in describing *pardina*, the original generic designation was restored by Sir Joseph Hooker, Linnæus triumphed, and *Amaryllis* is herself again." That triumph, however, was but shortlived. At the very time Mr. Shirley Hibberd was addressing these words to the Society, the final sheets of the "Genera Plantarum," the greatest monument of botanical labour of our time, were passing through the press, and, when the concluding part was issued, it was found that Herbert's

Hippeastrum had been retained, and not that only, but also the other genera separated by him from Amaryllis are established nearly as he left them. Thus the Dean has finally triumphed, for the question is settled for our lifetime at least. Nevertheless, the name Amaryllis is so closely, if not indissolubly, associated with these plants in horticultural nomenclature, that its separation from them is not likely to be popularly effected for some time to come, but in deference to our botanical friends the correct name *Hippeastrum* is used in this paper.

The present race of *Hippeastrum* has for its ancestry various wild forms or species, some of which were introduced to cultivation more than a century ago. Among the first of these were *equestre* and *Reginæ* from the West Indies and Central America, from which were derived the rich red and crimson tints of some of the earlier hybrids; *vittatum* from the same region, whose influence may still be occasionally seen in the longitudinal bands of colour more or less distinctly traced on the segments of several, even of the latest seedlings; *reticulatum*, a smaller-flowered species from Brazil, well marked by the crimson veinings and reticulations of its segments, and by its white striped foliage, characters which it has imparted to some of the beautiful autumn-flowering hybrids of which we have still too few. Many years later came *psittacinum*, also of Brazilian origin, a species with larger flowers than the preceding, and among whose most obvious features are the green centre and deep crimson veinings confined chiefly to the apical half of the segments; and about the same time *aulicum*, of robust habit and bright scarlet flowers, was sent from the Organ Mountains by Mr. William Harrison, the discoverer and introducer of many fine Brazilian Orchids. The species I have named were certainly the chief ingredients of the ancestry of the earliest progenies of *Hippeastrum*, and it is highly probable that others were also used, but their influence has long since disappeared from the existing race, and they may therefore be passed over in silence. One remarkable species must not be overlooked, on account of its long tube-like flowers of greenish white, reminding one of the long tubular Lilies of Japan and the Philippine Islands; this is *solandriflorum*. Herbert obtained mules from this and *regio-vittatum*, which greatly resembled the remarkable form figured in the *Botanical Magazine* for 1837, tab. 3542,

under the name of *ambiguum*, which had been received into the Botanic Garden at Glasgow. It seems that this form and the hybrids resembling it, more than *solandriflorum* itself, were afterwards used in the production of the few forms with long tubed flowers that were occasionally raised.

With the view of bringing before you as vividly as possible the improvement that has been effected in the Hippeastrum, I have brought together as many of the original species concerned in the ancestry of the race we now cultivate as could be procured and brought into flower. With these are associated two or three others said to be natural species, but of whose identification there is some uncertainty; and also three or four hybrids that have exercised a potential influence in the production of the race of Hippeastrum raised by us at Chelsea, and which form the most prominent links between that race and the original species. Two other elements that have contributed to the perfection of the Hippeastrum have yet to be mentioned; these are *paradinum* and *Leopoldi*, but as they appeared at a date so recent, and as the last named has exercised a preponderating influence in the production of most of the latest acquisitions, it will be best to deal with them in their chronological place, and to take a rapid retrospect of what was achieved with the older forms before their appearance.

Dean Herbert was the first who commenced systematically and persistently the hybridisation of the Hippeastrum, and he has left us an account of his early operations in the *Transactions* of the Horticultural Society of London, and in the appendix to the tenth volume of the *Botanical Register*, published in 1824; his later operations are recorded in the *Journal of the Society* for 1847. As early as 1824 he had thirty-five different crosses, and there were four or five more in other collections. A coloured plate of one of his hybrids, which he considered to be the best in colour he had then obtained, and which he called *splendidum*, is given with the appendix to the *Botanical Register* for 1824. He had raised it from *vittatum* crossed with *Reginæ* or *equestre*, but, owing to a confusion in the labels, he was uncertain which. Judging from the drawing, it would now scarcely attract a passing glance. At that time, however, another hybrid came under the notice of amateurs, on account of its brilliant colour, and which was destined to attain great prominence on account of

the influence it exercised in the production of future progenies. This became known in gardens under the name of *Johnsoni*, but its origin is somewhat obscure. It is mentioned by Herbert in the *Transactions* of the Horticultural Society of London for 1819, where he says, "I have many seedlings from Johnson's *regio-vittatum*, and I have some mule *equestre-vittatum* superior to Johnson's flower." What became of these mules is not stated, but three or four years later, some doubts having arisen respecting the parentage of *Johnsoni*, an experiment was made in the garden of the Earl of Carnarvon at Highclere by Mr. Gowen, who crossed *vittatum* with *Reginæ*, the reputed parents of *Johnsoni*. The seedlings proved to be identical with *Johnsoni*, and its true parentage was thus established. The account of Mr. Gowen's experiment is given in the *Transactions* of the Horticultural Society for 1823, in which there is an incidental allusion to the Botanic Garden at Liverpool, and from which it may be assumed that the original *Johnsoni* was raised there. I am glad to be able to bring before you a bulb of *Johnsoni* in flower, and I know of no more interesting subject in the whole history of the Hippeastrum than the preservation of this hybrid during so many years.

Passing over several hybrids that subsequently appeared, but which enjoyed but an ephemeral reputation, I come to *Acramanii*, for many years cultivated in gardens under the erroneous name of *Ackermanni*. From the *Gardeners' Chronicle* for 1850, page 357, we learn that the original *Acramanii* was raised by Messrs. Garaway & Co., of Bristol, in 1835, from *aulicum platypetalum* (figured in the *Botanical Register* for 1826, tab. 1038) and *psittacinum*. This hybrid unquestionably marks a great advance on all its predecessors in those qualities which constitute the ideal of florists, but it appears to have given place a few years afterwards to a still finer form raised by the same firm from *aulicum* and *Johnsoni*, and called by them *Acramanii pulcherrimum*. This, too, I am glad to bring before you to-day, and thus two of the most important links in the chain of affinities connecting the noble race of Hippeastrum of our time with the wild forms, and with the first mules raised by the horticulturists of two generations ago, are here represented.

The appearance of *Acramanii pulcherrimum* gave a considerable impulse to Hippeastrum culture, for we find it taken up shortly

afterwards by the late Louis Van Houtte of Ghent, and by other Belgian and also by French horticulturists, "who raised seedlings in considerable numbers, and by careful hybridising originated many fine varieties." Some of Van Houtte's best acquisitions were figured from time to time in the *Flore des Serres*. They were brilliant in colour, and surpassed in that respect the general host of varieties cultivated at that time; but they are all characterised by narrow acuminate segments scarcely broad enough to exclude the daylight from behind. Van Houtte's best forms were afterwards surpassed by the acquisitions of the elder De Graaff of Leyden, to whom we are indebted for the form that bears his name, and which was one of the parents of Empress of India, raised by his sons, the present well-known cultivators of the Hippeastrum—a variety that afterwards became an important factor in the production of some of our best types. Both *Graveanum* and Empress of India are in the collection exhibited by us to-day. In our own country many meritorious forms have been raised by Mr. R. S. Holford of Westonbirt, Mr. Baker, formerly gardener at Coombe Warren, Messrs. Henderson, the late Rev. Thomas Staniforth, an ardent admirer of the Hippeastrum, and by the late Mr. Speed of Chatsworth.

I have now arrived at another turning-point in the history of the Hippeastrum; this was the discovery of *pardinum* and *Leopoldi* by our collector Pearce on the Andes of Peru, and their introduction by us into European gardens. Placing these side by side with the older species; it will be readily seen that as regards the shape of the flowers and the length of their tube, a series may be found of which the half-closed, long-tubed *solandriflorum* occupies one extreme, and the open, almost tubeless *Leopoldi* the other. Between these extremes the other species participating in the parentage of our present race of Hippeastrum may be arranged accordingly. Up to the time of the introduction of *Leopoldi* most of even the best forms obtained by hybridisation were characterised by more or less narrow and acuminate segments, of which the lowermost was almost invariably imperfect, or, at best, unsymmetrical with the others; by a longer or shorter tube, which they had inherited from their wild ancestors; and by the green central rays so conspicuous in *equestre*, *psittacinum*, *aulicum*, and others. The introduction of *Leopoldi* and *pardinum* therefore afforded an opportunity of exceptional

interest for attempting the improvement of the old race of Amaryllis that was not to be neglected, and we accordingly commenced in 1867 a series of experiments with that object. The first experiments with *pardinum* were made by Seden, who raised *Chelsoni* and Brilliant. The general results obtained with *pardinum* were, however, disappointing, and we soon abandoned the use of that species. We also tried *aulicum* in our earlier operations, but we obtained nothing of value, the ill shape of the flower of that species, and its large green eye, preponderating in the progeny. In *Leopoldi* we found a more potent subject; in fact it is not saying too much in affirming that throughout the genus no single species has exercised so preponderating an influence in the production of the best forms as this. Our first results with *Leopoldi* were encouraging, for although we found, as Dean Herbert had found half a century before, that when a particular species is crossed with a mule, or any particular mule with a species, the individuals of the resulting progeny have not only a great resemblance to each other, but also many of them come so near the species as to be practically the same thing, or the same but slightly varied, yet we are able to select several distinct new forms showing a marked improvement on their progenitors in breadth and substance of segment, size and symmetry of flower, &c., while preserving the main features of *Leopoldi*. The hybrids of this type culminated, as regards form and size of flower, in a variety we called John Heal, as a recognition of the patient and intelligent perseverance of the foreman who now cultivates our collection. The scapes of *Leopoldi*, it will be remembered, are two-flowered, while those of some of the older species, and especially some of the best hybrids derived from them, are four to six flowered. We attained great perfection in form and size in the variety John Heal. Our next step was to attempt to obtain four to six flowered scapes with flowers equally good in form and size, with diversity in colour; we therefore crossed De Graaff's Empress of India, a noble four to six flowered variety of brilliant colour (a specimen of which is before you), with the best *Leopoldi* forms, with the result of obtaining not only four to six flowered scapes, but also decided breaks of colour into various shades and tints, and by the intercrossing of the forms so obtained has resulted the race now so universally admired.

In the course of our experiments it was another desirable point to diminish as far as possible the green central rays that are objectionable from a florist's point of view, and how far we have succeeded the splendid flowers now before you will show. Then, again, the irregularity of the lowermost segment has always been looked upon as a defect, but one which is inherent in the ancestral forms; and although it may never be entirely obliterated, yet much improvement in that direction has been effected, as may be seen in some of the flowers exhibited to-day. Another fine race has been obtained by crossing the best *Leopoldi* forms with *reticulatum*, which has resulted in the production of a beautiful series of autumn and winter flowering varieties, of which the finest of the first raised progeny is known under the name of Autumn Beauty, while from a subsequent cross we raised Favourite and Edith M. Wynne. Other fine late-flowering varieties of the *reticulatum* type, in which *Leopoldi* did not participate in the parentage, are named Mrs. Garfield and Mrs. Lee.

Comparing the latest acquisitions with the original species in respect of size, we find that the flowers of the latter range from $2\frac{1}{2}$ to 5 inches in diameter, with segments from $\frac{3}{4}$ to $1\frac{1}{4}$ inch broad, and with tubes 3 to 4 inches long; that of *solandriflorum* 7 to 8 inches long. Our best recent types have a diameter of 9 to 11 inches, with segments $3\frac{1}{2}$ to 4 inches broad, and the tube almost obsolete. As regards colour, scarlet and red prevail in some of the natural species; crimson-scarlet veins, streaks and reticulations in others, and all with a larger or smaller green centre. Besides these, *solandriflorum* and *calyptratum* are greenish white; but the last named has not been used of late for hybridising. We have now an uninterrupted range of colour from deep maroon-crimson through crimson, crimson-scarlet, pure scarlet, orange-scarlet, carmine, rose and rose-pink, to almost pure white, with striped and reticulated forms of all these shades of colour.

To remove any misapprehensions, if such exist, respecting the facility with which the *Hippeastrum* (*i.e.*, the *Amaryllis*) may be cultivated, I will now formulate the cultural routine followed by us, and under which failures are practically unknown.

Soil.—The compost should consist of two-thirds good fibrous loam, such as is used for vines, and one-third cow manure fresh

from the stall. These ingredients should be brought together towards the end of July, and allowed to remain in heap for about three months, when they should be turned over and well mixed together. The mixture must at no time be allowed to get too wet, and when required for potting, in the early part of the following year, a proportion to the whole of nearly one-third of silver sand should be added.

Potting.—The pots selected should be in proportion to the size of the bulbs, and the smaller the pots that can be so used the better; in every case the drainage must be ample. Before potting every vestige of old soil should be shaken off, and any decaying roots, and any other decayed matter that may be found about the bulbs, should be removed. The potting should be performed according to the time the bulbs are required to be in bloom, a period of eight to ten weeks being the usual interval between the potting and the flowering of the bulbs. We usually commence potting about the middle of January, and have bulbs in flower about the middle of March, the flowering season continuing thence for eight to ten weeks. After potting the pots should be plunged in some suitable material; no bottom heat should be applied at first, but the bulbs should be allowed to start into growth as gently as possible.

Temperature.—After potting the temperature of the house should be maintained at 13° C. (55° F.) for three or four weeks, then a little bottom heat should be given, and the temperature of the house raised to 15° C. (60° F.). With this temperature the house should be damped down occasionally, and when the weather is warm and bright a little air should be admitted at the top for a couple of hours in the middle of the day. When in flower a light shading should be used to prolong the flowering season.

Watering.—This requires the most careful attention; it is, in fact, the pivot on which successful Hippeastrum culture turns. More bulbs are injured or die from excess of water than from any other cause, and excess of water is one of the causes of the so-called Eucharis mite, one of the most destructive pests the cultivator of the Hippeastrum has to contend with. At the time of potting the new soil should be a little moist; after potting no water should be given for four or five weeks, or till the foliage and flower-scapes have attained a height of 2 to 3 inches;

then it should be sparingly applied until the flower buds appear, but from that time a more liberal supply should be given till the foliage is perfected; it should be then gradually reduced until about the middle of August, when it should be withheld altogether. Eight or nine weeks later the pots may be lifted out of the plunging material, and after an interval of another month all the plunging material should be removed from the house, and the bulbs kept perfectly dormant on the stage till the potting season comes round again; the house, too, should be kept as dry as possible the whole time the bulbs are at rest. We use no liquid or artificial manure at any time. Much has been written in the horticultural press about the mite that appears both on the *Eucharis* and on the *Hippeastrum*, but we have no fear of it. In my opinion its prevention is simply a matter of not over-potting and not over-watering, and we have seldom seen bulbs, however badly affected, that could not be brought into perfect health again.

Treatment after Flowering.—After flowering the pots should be kept plunged, and each pot and about half the exposed part of the bulb should be covered with the plunging material. When the roots begin to push, more bottom heat and more water should be given; the atmosphere of the house should be kept more humid, and the foliage occasionally syringed. In bright, warm weather a slight shading should be used, and the growth of the plants encouraged to proceed as rapidly as possible, for the stronger the bulbs the finer will be the flower scapes and their flowers in the following spring. Towards the end of July the bulbs should be gradually ripened by diminishing the shading, and three or four weeks later the shading may be discontinued altogether, and as much light and air admitted into the house as possible.

Insects.—There will be no difficulty with these pests if their first appearance is watched for, and their increase checked as soon as they are discovered. Thrip will spot the foliage, but fumigating occasionally will keep them under. During the summer months red-spider will also attack the foliage, but their increase can be prevented by syringing, and by keeping a moist atmosphere in the house. Sometimes mealy-bug appears, especially if the bulbs are placed near plants subject to the attacks of that plague, but it can be easily kept in check by

cleaning or syringing with blight composition once or twice a week, and in winter, when the foliage has fallen, it can be seen and removed without much trouble.

Some cultivators of the *Hippeastrum*, as Mr. R. S. Holford, of Westonbirt, who possesses the finest amateur collection in this country, do not replot their bulbs annually, nor do they plunge them as we recommend, but give them liquid manure during the growing season. The bulbs are also grown in different houses, amongst other plants, and in vineries, and most successfully too, with the advantage of prolonging the season to such an extent that a *Hippeastrum* in flower can usually be seen at any time of the year. The value of the *Hippeastrum* as a decorative plant can thence be scarcely underrated, for even when the scape is cut and placed in water the flowers continue fresh nearly as long as if left on the bulb. Some of the Dutch growers treat the *Hippeastrum* much in the manner that we do, notably Mr. de Graaff, of Leyden, whose collection is a magnificent one, and to whom we are indebted for very valuable information when we commenced the cultivation of this beautiful plant, and with whom we are now in friendly rivalry in the raising of improved forms.

THE HIPPEASTRUM.

By Mr. JAMES DOUGLAS, F.R.H.S.

[Read March 11, 1890.]

THIS genus of plants has been well known to cultivators for many years, but it may be safe to assert that not at any previous period of their history have they been so popular as they are now, and as flowering plants for the adornment of the greenhouse or conservatory in the months of March and April they are of the greatest value. Nearly the whole of the original species in cultivation have been introduced from South America, and the beautiful garden varieties now in cultivation have been obtained by crossing and inter-crossing those species.

It is to me a great pleasure to trace the history of this or any other favourite garden-flower from the earliest period of their culture in gardens to the present time, and it is of much interest

to us to know who cultivated and improved our garden favourites, or began the work that we are now able to continue. Our present subject has not a very early history, for, with the exception of the well-known *Sprekelia formosissima*, a close ally, which was introduced to Europe in 1593, no sort of *Hippeastrum* was introduced until more than a century later.

The *Sprekelia* is not admitted into the genus *Hippeastrum*, and cannot be crossed with it, and seldom produces seeds in England; but it may be interesting to remark here that Colonel Trevor Clarke gave me a few seeds of the variety *glauca*, which he had saved in his garden, and they germinated freely. Parkinson figured this *Sprekelia* in the "Paradissus," 1629, and described it as the "Indian Daffodil with a red flower." The *Vallota purpurea* is a greenhouse plant that is by some supposed to be a *Hippeastrum*, but it is also outside this genus. Some persons do not cultivate it successfully. I find it does well in peaty soil, and likes a sunny corner of the greenhouse with plenty of water. Dean Herbert states in his "Amaryllidaceæ," page 134, on the authority of Dr. Burchell, "that it was the only bulb of the order that he found growing in boggy peat in Africa. It delights so much in wet that it will thrive even in water."

One of the earliest species introduced to our gardens is *H. Reginae*, figured in the *Botanical Magazine*, tab. 453. It has very handsome flowers, which, as far as we know, opened for the first time in Mr. Fairchild's garden at Hoxton in 1728, "when the late Dr. James Douglas caused a figure of it to be drawn, and wrote a folio pamphlet on it. He gave it the name of *Lilium Reginae*, because it was in full beauty on the 1st of March, which was the late Queen's birthday." The roots came from Mexico.

H. vittatum was introduced about the year 1769, and Mr. Baker states in his handbook that there is a dried specimen in the British Museum from the garden of a Mr. Malcolm, dated 1777. It is a distinct and good species, well figured in the *Botanical Magazine*, tab. 129, where it is stated it was introduced from the Cape by Mr. Malcolm. *H. equestre* is another of the very early introductions. Mr. Baker says it was noticed by Hermann in 1698. But, according to the "Hortus Kewensis," it was not introduced until 1778. Soon after that date it is recorded as flowering in several collections about London, and it is well figured in the *Botanical Magazine*, tab. 305. *H. psittacinum* is an early

and important species, introduced in 1814 from South Brazil. It is figured in the *Botanical Register*, tab. 199, from flowers obtained from W. Griffin's hothouses in South Lambeth, and it is stated that the flowers were perhaps the most beautiful of this splendid genus. In 1819 *H. aulicum* was introduced, and also flowered in the South Lambeth garden of Mr. Griffin; *H. solandriflorum* about 1820; and as this, *H. aulicum*, and all the species of any importance introduced at this time are well figured in the *Botanical Magazine* or *Register*, or both, we have full knowledge of their flowering, as well as the dates of their introduction. We also know from Dean Herbert's work ("The Amaryllidaceæ") that the first hybrid Hippeastrum raised in England was *Johnsoni*, or *regio-vittatum*; it was raised in the year 1810 by a person named Johnson, who had a small garden in Lancashire, and he thought it was a cross between *vittatum* and *Sprekelia formosissima*. Dean Herbert produced the same plant by crossing *vittatum* with *Reginæ* in 1811. It may be interesting here to remark that Dean Herbert raised an immense number of seedlings by careful hybridising from 1811, until his death, in his gardens at Mitcham, Highclere, and Spofforth. His hybrids were named by a union of the specific names of the parents. Thus a hybrid between *aulicum* and *vittatum* was named *aulico-vittatum*; between *reticulatum* and *Johnsoni*, *reticulato-Johnsoni*, &c., through a long series of crosses, which are fully described at page 142 of the "Amaryllidaceæ." The name of Heer S. A. de Graaff, of Leyden, should be introduced here as a raiser and cultivator of Hippeastrums. I am informed by Heer de Graaff that this firm has cultivated Hippeastrums since 1790; but only one species was known to be cultivated at that early date, viz., *vittatum*. Later, when *fulgidum* and *crocatum* were introduced, these were used as seed or pollen bearers, with the seedlings from *vittatum*. Heer de Graaff says in his note to me that his father crossed *fulgidum*, *crocatum*, *Johnsoni*, and *vittatum* over and over amongst themselves, and he obtained rich dark colours, but small flowers. The present Heer de Graaff began working amongst them in 1862, and obtained the best species and varieties with large flowers to hybridise with, amongst them *psittacinum*. From the seedlings handed down to him by his father and granduncle he obtained numerous remarkably fine forms, of all shades of

colour, as well as waxy-white varieties. In recent years he says: "We now cross only the best forms with the colours we want, and never fall back on the species." As to the time the seedlings take to produce their flowers, the Leyden strain can be flowered in four years from the seeds, the *Leopoldi* and *pardinum* strain in two years.

The bulbs are stored on shelves until they are ready to be repotted early in the year, when the soil is shaken out from the roots; but the roots are carefully preserved. They are repotted about the middle of February; but Heer de Graaff adds, they would rather do it early in January if convenient. They are in flower from four to six weeks from the time of potting, and are plunged in a bottom heat of tan, which is preferred to all others; the temperature of the house is about 60°. The fine *Hippeastrum* Empress of India was raised here by crossing *psittacinum* with *Graveana*—not the French variety, but a seedling of their own. Heer de Graaff further adds that the foliage is cut off in November; the bulbs receive no water after this, nor during their whole period of rest.

Messrs. Kelway & Son, of Langport, Somerset, began seventeen years ago a system of culture that seems well worth notice. Messrs. Kelway have exhibited their strain both in the form of cut flowers and plants at several meetings of the Society, and as decorative subjects for the greenhouse or conservatory the strain is admirably adapted. Mr. James Kelway was good enough to write me details of the culture practised at Langport.

Writing on January 29, he says:—

"We are now commencing to plant our seedlings and offsets in unheated span-roofed frames; these frames are 9 feet wide, with wooden sides and ends. They are placed over the ordinary soil of the garden in an open position. The soil, after it has been enriched with old hotbed or cow manure, with a liberal supply of yellow sand, is ready for planting. The bulbs are planted in drills from 6 to 9 inches apart, and from 3 to 6 inches asunder in the drills; they are also planted from 2 to 4 inches deep, according to size. They remain in these frames two or three years, and by that time they are large enough to flower. In winter they are protected by straw being placed over the bulbs under the glass, and mats outside.

When the bulbs are dug up in the autumn, all of them large enough to flower are planted in pots, the smaller ones being again planted out in the unheated frames. They flower in April, May, and June, but isolated bulbs produce flowers all through the season."

Messrs. Kelway grow twenty thousand bulbs in this way.

I may just add that I am quite well aware of the great work carried on now for many years in the nurseries of Messrs. James Veitch & Sons, Chelsea; but as their Mr. Harry J. Veitch has also prepared a paper on this subject, it will be best to leave it entirely in his hands. As a cultivator of these plants, and a raiser of seedlings, I may claim to be successful, and will shortly describe the system of management we have pursued for many years.

First, as to propagation. This is effected by seeds, and by offsets from the roots. Some varieties are much more difficult to hybridise than others. For instance, I have tried year after year to obtain seeds from the variety John Heal, and have managed to get three seeds in as many years. On the other hand, the very handsome variety Empress of India has produced 700 seeds from one flower-scape composed of five flowers. This is an exceptionally free-seeding variety, and has been the parent of many good garden forms. The structure of the flowers is such that anyone may be able to hybridise them. The seeds are usually ripe in August, and should be sown immediately. They soon germinate in a nice bottom heat, and in the course of a month or six weeks after the plants appear above ground they may be pricked out in boxes or flower-pots. I plant ten or a dozen plants in a 6-inch pot. The plants grow freely to the end of the season, nor do they cease growth all the winter. We keep them rather dry at the roots, and repot again about the first week in February—this time three plants in a 5 or 6 inch pot, and this will be space enough for them to grow in all through the season; and if they have been well cared for they will each have produced bulbs about the size of a bantam's egg. Next season these bulbs must be repotted singly, and after another season's growth will be all strong flowering bulbs. Culture of offsets is as simple as the raising of seedlings. There is but one time that offsets may be removed from the parent plant, and that is when the old bulbs are repotted in January. We

shake them out of the pots, and all offsets with a bit of root attached to their base are removed, and planted in pots according to their size; but an error is more likely to occur in over than in under potting. Light compost should be used, and a little clean sharp sand must be placed around each bulb.

The flowering bulbs are also carefully potted, after being cleaned from all dead and decaying roots, &c. We are also in this careful not to use too large flower-pots for them. I have had and have now bulbs of Empress of India, and seedlings from it, 18 inches in circumference, but never use pots larger than 8 or 8½ inches diameter, inside measurement; the larger number of bulbs go into 6 and 7 inch pots. All the pots are plunged to the rims in tan beds as they are prepared at the potting-bench. The potting soil is composed of fibrous loam, two parts; good dry fibrous peat, one part; one part leaf-mould; and a barrow-load of manure to six of the loam and peat, with sand added to keep the mass open. The temperature of the house should be 50° at night to start with, rising 10° as it is seen that the bulbs have started to grow. The main collection will be in flower about the end of March. When in flower they may be taken from the hothouse and be placed in the greenhouse or conservatory, where the flowers remain longer in good condition. When the flowering period is over the plants must not be pushed into some out-of-the-way corner where they cannot get light and heat. They require a hothouse temperature to get up the bulbs to their original plumpness, and to lay the foundation for an abundant flowering time next year. When the bulbs rush into flower and leaf in the early spring, the entire substance of the bulbs seems to go with them, and it requires much care to bring them up to a satisfactory condition again. The leaves must be kept clear from all insect pests, and they must be shaded from the sun in hot weather during the summer months.

SALADINGS.

By M. HENRY L. DE VILMORIN, F.R.H.S., &c., &c.

[Read March 25, 1896.]

THE craving for fresh, crisp, uncooked vegetable matter is not only common to most men, it is also a healthy appetite, and one

that is in accordance with the recognised laws of nutrition. Such vegetables as are generally known as salads are the means of supplying to the human frame some elements which are as necessary to the preservation of health as the flesh-forming or heat-producing matter which is abundant in richer articles of food. Salads contain a relatively high proportion of mineral matter, chiefly salts of potash, which, although equally plentiful in other vegetables, are mostly removed from them in the process of boiling, and therefore lost to nutrition, while they are preserved in their entirety in the case of salads.

Although the idea of a salad is at first sight specially connected with green or partially blanched leaves, the fact is that every part of plants may be used, and is in some places used, as a salad, namely: roots, as in Celeriac, Radishes, and Rampion; bulbs, or underground stems, as in Onions and Stachys; leaves, as in Lettuces, Endives, Cresses, Corn Salad, and many others; leaf stalks, as in Celery; stems, as in Asparagus; bracts, as in Artichoke; and even flowers, as in Nasturtium and Yucca; or fruits or seed-pods, as in Cucumbers, Capsicums, and Tomatoes.

To review all the vegetables which are used for salads would be to go over a ground again which has been gone over before by so many learned and practical men that I should fear in so doing to waste your time and exhaust your patience to no purpose. I will therefore take the liberty to confine my remarks to two special points only.

First, I will give a list of the principal vegetables used as salads in France, and generally brought to the Paris market.

Second, I will insist on one of the operations often connected with the growing of salading, namely, blanching, and give the description of some vegetables which, naturally, being almost uneatable, become by blanching most excellent materials for salads.

Our Continental conception of a salad does not entirely agree with the British view of the same. Salads proper, with us, are only such vegetables as form a special and distinct dish by themselves, being dressed with oil and vinegar, and, of course, salt and pepper. Such salads are often served along with meat, but they are not necessarily a complement to it, and in that respect they differ from some other vegetables which, although

served uncooked and dressed in the same manner, are never put on the table except as companions to meat. Lettuces, Endives, Corn Salad belong to the former class; Bitter Chicory, Red Cabbage, Garden Cress belong to the latter. Besides, some other plants are used only to flavour or decorate salads. I will mention them all very briefly, stating at what time of the year each one is obtainable in the Paris market.

I.—SALADS PROPER.

Lettuce: Cabbage or "headed" Lettuce is to be had all the year round. It is supplied from the open ground from April to November, and is forced under glass bells or under frames from December to May. Cutting Lettuce is plentiful from November to May. Cos Lettuce, chiefly Paris Cos, is grown from May to November in the open, and forced from December to May.

Common or Bitter Chicory is not much used as a salad proper, except after blanching. It will be spoken of at some length hereafter. It is available as *Barbe de capucin* from November to April. Improved Common Chicory, a broad-leaved variety, is in season from June till November.

Curled and Batavian Endives are the most largely consumed salads next to the Cabbage and Cos Lettuces. They are on the



FIG. 1.—RUFFEC CURLED ENDIVE.

market as open-air produce from June to February, and as forced produce from April to June.

Some of the Curled Endives, the Ruffec variety especially (fig. 1), can be kept sound and good till mid-winter, and even later, by throwing straw mats over the beds in dry weather, or by covering the plants with dry leaves.

Curled Endives are now forced in early spring by sowing, pricking, and planting, all on a hotbed, and giving as much light and air as the weather will permit. Heads 15 inches in diameter, quite full, and weighing over two pounds, can be had early in May.



FIG. 2.—SCAROLLE EN CORNET.

Scarolle en cornet, which might be called in English "hooded" Endive, is comparatively hardy, and may assist with the new variety, *Reine d'hiver*, in extending the use of out-of-doors Endives till the end of winter.

Dandelion can be had green all the year round, blanched from December to April, and half-blanched from March to May.

Corn Salad (fig. 3) is plentiful, in any weather, from October to April.

Water-cresses, remarkable for their size and beauty, are on the market all the year round.

Purslane, whether from the open border or forced, can be had at all seasons, but it is not much used as a salad.

Rampion is mainly a winter salad, from October to March.

Salsafy tops, which give a very fine and tender salad, with a

pleasant nutty flavour, are used just as the roots from which they are taken, from September till May.

To the foregoing salads people are often in the habit of adding, for the sake of flavouring or decorating the dish : Celery



FIG. 3.—CORN SALAD (*Valerianella*).

from August to March ; Celeriac from September to April ; Chervil, Chives, and Shallot all the year round ; Nasturtium flowers, May to November ; Borage flowers, all summer. Mustard and Rape seedlings are not used in Paris.

II.—SALADS USED AS AN ACCOMPANIMENT TO MEAT.

Bitter Chicory : This is used by cutting the young and tender green leaves in fine, long strips. It is mainly used with boiled beef, and is a very nice salad if the leaves be cut often, and the plant watered.

Garden Cress, all the year round.

Cucumbers, ditto.

Red Cabbage, from August till April. This is cut like the Bitter Chicory, and first seasoned with vinegar, when from a dull purplish red it turns into a bright crimson ; a little oil is added at the time of serving up.

Tomatoes, from the open ground from August to October ; forced from April to July ; kept fresh in fruit-rooms from November to March—in fact all the year round.

Some more vegetables are much used in the South of France as salading—namely, Rocket (fig. 4), *Eruca sativa*, and *Terra crepola Picridium vulgare*, but these never appearing on the



FIG. 4.—ROCKET.

Paris market must be left out of this paper, as well as the large sweet Tripoli Onions.

Several vegetables are added to salads in a cooked state, as Blood-red Beets, Cauliflowers, Asparagus tips, French and Kidney Beans, Lentils, hard-fleshed Potatoes, &c. These I must also dispose of by simply naming them.

Again, some other vegetables are used uncooked, as Radishes and Artichoke, and are, I think, included in the term "salading," although not considered on the Continent as materials for salads. Both kinds are plentiful at all times on the Paris market, the Artichoke coming from the Riviera or from Algeria, all the time between November and May.

I now come to

III.—BLANCHING AND BLANCHED VEGETABLES.

It is well known that the flavouring principle is developed in most plants under the action of light and heat, just as the colouring matter is, and this is the reason why the process of

blanching, which makes the vegetable matter acted upon whiter and more tender, renders it at the same time milder in taste and more palatable, if naturally of a strong flavour.

M. Henri Lecoq, a well-known professor of botany, published in the year 1851 a short paper, in which he maintained that upwards of two hundred neglected or despised native plants might be converted by blanching into very good and useful vegetables. Of course the assertion was made half in jest, but still a good deal of truth underlies the apparently paradoxical opinion of M. Lecoq. In later years MM. Pallieux and Bois, the learned authors of that very suggestive book, "*Le potager d'un curieux*," tried numerous experiments in the same direction, and succeeded in obtaining very good salading from vegetables not generally used for that purpose, as Salsafy, Scorzonera, and Skiret, and even from such wild plants as *Cirsium oleraceum*, *Helminthia echioides*, and *Smyrniun Olusatrum*.

Although a very large number of plants can be made esculent by blanching, it becomes evident, upon careful consideration, that those only can be made use of profitably which, firstly, form rather large roots or crowns wherein a good provision of nutriment can be stored, and this being converted into new growth by the action of heat and moisture, supplies fresh vegetable matter during the winter months, when such salading is made more valuable by the scarcity of open-air vegetables; secondly, such as are sufficiently hardy for their roots or crowns to be handled, even in rough weather, without too great a danger of their being destroyed by cold or damp; and, thirdly, such as are easily grown in the first stage of their cultivation, and so supply a comparatively inexpensive material for the winter treatment, which is always more or less costly.

Those characters of bulk, hardiness, and cheapness are all forthcoming in the two vegetables which it is my purpose to introduce as salading to the notice of the Royal Horticultural Society in this paper, namely Dandelion and the Common or Bitter Chicory.

Dandelion (*Taraxacum officinale*, Wiggers, or *Leontodon Taraxacum*, L.) is a native wild plant, common on well-drained meadows and pastures, and conspicuous by its large bright yellow flowers and winged seeds. The stem is reduced to a short, conical, subterranean body, on which are inserted

numerous leaves, deeply toothed, which spread in a flat rosette firmly pressed on the ground, and from the axils of which the flower-buds are borne on smooth, cylindrical, hollow stalks. By cultivation and by selection of the best plants, the number and size of the leaves have been greatly increased, and plants are easily produced now which, when ready for use, weigh considerably over one pound.

In France wild Dandelions are often gathered from grass lands, and such plants as have been accidentally earthed up by being buried in mole-hills are considered a delicacy.

But Dandelion has been grown as a vegetable in the vicinity of Paris for half a century or so. At Montmagny, Deuil, Sarcelles, and Meaux considerable spaces are devoted to it every year, and large quantities are sent to the Paris market.

The field culture is made by sowing in April, in rows about 2 feet apart; the soil must be pressed hard before sowing, and again after covering the seed. Plants are thinned to 3 or 4 inches in the rows. Weeding in summer is very important. In September or later the plants are earthed up with loose soil, which by hoeing is made into a small ridge on the top of each row. The plants grow through the earth, even in winter, and as soon as the leaves begin to appear on the surface the plants are ready for use. Some leaves always manage to steal to the light unperceived, and immediately turn green. Dandelion grown on that system is called "half-blanched," and the wholesale price it fetches is only from eight to twenty shillings per hundred-weight.

Dandelion is also treated in the same way as Chicory is for *Barbe de capucin*, of which more will be said hereafter. Crowns are pulled up in winter with all their roots and put on a heap of manure, in a cellar or other dark place, with some earth or thoroughly decayed manure under the crowns. In eight or ten days the leaves grow to a length of from 5 to 6 inches, and they are then cut and sent to market, where they sell for from ten to twenty-eight shillings per hundredweight.

In gardens Dandelion is generally sown on a seed-bed, pricked and planted out 18 to 20 inches apart each way, which allows of some other quick-growing crop being raised between the rows. Before winter the plantation is cleared up of everything except the now strong plants of Dandelion; all the dead or decaying

leaves are removed, and the plants are prepared for blanching, which is effected either by spreading clean, sharp sand 4 inches deep over the whole of the bed, or by covering each plant with an inverted garden-pot. The leaves should not be tied up, and the inside of the pot should be perfectly clean. By heaping stable manure or some fermenting material round the pots, the crop can be advanced several weeks. If blanching be not thought necessary, simply throwing a mat over the plants just as they begin to grow after winter greatly improves the tenderness and flavour.

Three garden varieties are chiefly grown in France :—

1. Broad-leaved Dandelion (*Pissenlit très hâtif à large feuille*). This is very early, and makes a broad but thin rosette of leaves. It is often cooked.

2. Solid-hearted or Cabbaging Dandelion (*P. à cœur plein*)



FIG. 5.—SOLID-HEARTED DANDELION.

is more remarkable for the great number than for the size of its leaves. Instead of a single whorl it produces a great many, and forms a perfect tuft of dense green foliage, which being blanched supplies a large amount of very crisp, white, nutty, and slightly bitter salad. This is the variety grown by market gardeners.

3. Moss or Curled Dandelion (*P. mousse*). This is rather like the former, but much more finely cut and curled. It is very pretty, but yields rather less than the solid-hearted variety. It is a garden sort. All three kinds come true from seed.

Chicory: Everyone knows, at least by name, the large-rooted Chicory, the fleshy roots of which are extensively grown in Flanders, where they are sliced, dried and browned by heat, and powdered, yielding by that process an adjunct to, a substitute

for, and sometimes an adulterant of coffee. But it is less generally known that the same plant is largely grown as a vegetable, the roots being heated in winter to promote growth, which, according to the size of the roots and the variety used, develop into two very different market produces—namely, *Barbe de capucin* from small roots of the common variety, and Witloof from large roots of the Brussels Chicory.

Barbe de capucin has been in use for a very long time in Paris. It can be obtained from the common or wild bitter

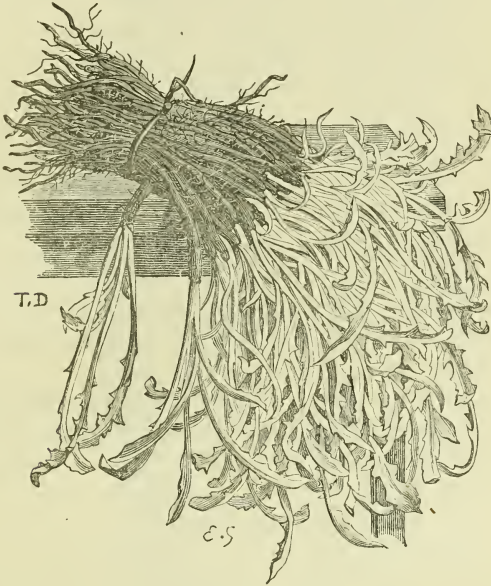


FIG. 6.—BARBE DE CAPUCIN.

Chicory; but the forked, misshapen roots of this are far more awkward to manage and to tie into bundles than those of the large-rooted variety, which, being straight and clean, are now in common use with the growers.

The sowing takes place from April till May, in open fields, in rows 16 to 20 inches apart. Plants are left rather thick in the row, according to the goodness of the land. From December till April, when out-of-doors saladings are scarce, roots are pulled out to meet the demand from the forcing-house. A bed of well-mixed manure is laid and well levelled. The roots are

well dressed, and being tied in large bundles, with all the crowns on a level, are set upright on the bed, three or four days after it has been made, when the heat is already somewhat spent. The roots are watered, if necessary, before the growth sets in. After a fortnight or twenty days, the leaves are 8 to 10 inches long, and fit for use. The roots are then untied, sorted, and made into small handfuls of from 15 to 20 roots, which are again tied into larger bundles for sending to market, which bundles sell at from eight to twenty shillings per hundred.

Notwithstanding the utter darkness of the cellars where the forcing and blanching process is conducted, the *Barbe de capucin* offers a marked bitterness, which in Paris is relished rather than otherwise. Dark-red Beet is often associated with it.

Witloof, or the Brussels Chicory (fig. 7), is made from a distinct variety which is chiefly notable for the width of the leaves, and especially for the great development of their midribs. It is noticeable that in all leaves developed in darkness the rib seems to attain its normal size, while the leaf-blade itself is greatly reduced in breadth. This fact is particularly striking in Witloof, where the head seems to be made up almost entirely of the imbricated leaf-ribs.

Roots are grown as with *Barbe de capucin*, but farther apart, and must be thinned to a much greater distance, as each root has to attain the size of a spade-handle or of a billiard-cue at its larger end.

Brussels remains to this day the head-quarters for the production of Witloof. The system adopted there is as follows: Roots are dug up in October, and either immediately dressed and placed in the forcing-pits, or put by till the time comes to force them. Each root must be carefully dressed before forcing. The leaves surrounding the central shoot are cut back to rather less than 2 inches of their base, and all leaves belonging to lateral shoots are entirely removed with all buds, as all the strength of the root should be thrown into the main shoot. The inferior part of each root is cut, so as to make the roots perfectly even, as all the crowns must stand on a level in the pit.

This is made from 12 to 18 inches deep. The roots are put standing on the bottom, which has been lined previously with fine sod or leaf-mould; they are planted in rows 4 to 6

inches apart, and stand quite close in the rows. Fine earth, sometimes mixed with sandy peat, is sifted over the roots and

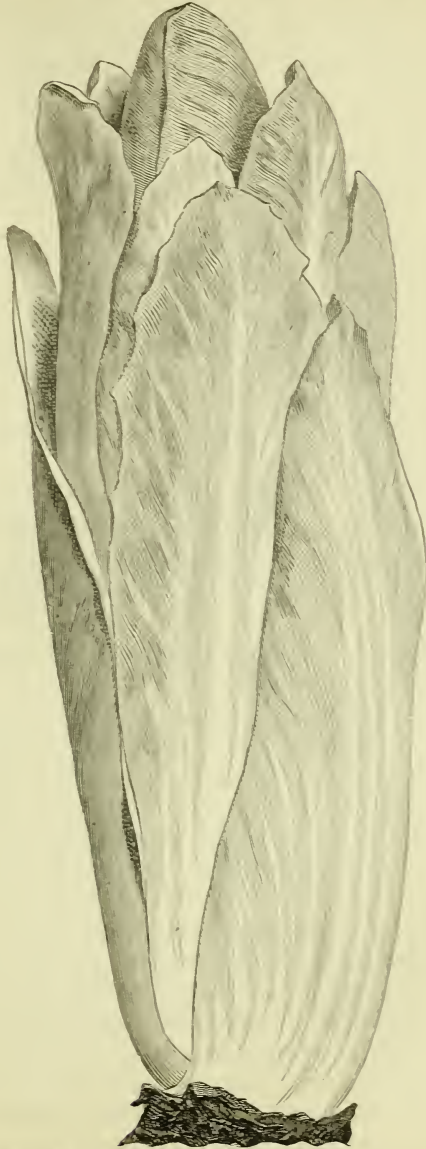


FIG. 7.—WITLOOF, OR BRUSSELS CHICORY.

made to penetrate between them, so as to hold them firmly in their place. More earth is added so as to cover the tops of the roots about 8 inches deep, and to fill the pit level with the garden soil. The pit is generally made 4 feet wide, and often very long, but the whole is not forced at one time.

Stable manure is heaped on the part which is to be forced, $1\frac{1}{2}$ to 3 feet high. In twenty days the "Witloof" is marketable. The manure is then removed, pushed further on if not exhausted, and being mixed with fresh material it serves to force the next batch.

The eatable part of Witloof is 4 to 5 inches long, not quite 2 inches in diameter, in the shape of the head of a small Cos Lettuce; it is almost pure white, very solid and firm. A piece of the crown of the root is cut along with it, which is too bitter to be eaten. Used as a salad Witloof is milder in taste, and at the same time more watery, than *Barbe de capucin*. It is also used cooked, and in that way comes nearer Seakale than any other vegetable I know of.

From one ton to a ton and a half comes daily to the Paris market from Brussels and the neighbouring places in winter, the market price averaging thirty to forty shillings per cwt. The heads are generally placed in small baskets ready for retailing. Witloof is known in Paris as *endive*, which is a wrong name, as the denomination applies to the garden varieties of *Cichorium Endivia*, the Curled and Batavian Endive.

Some growers in the suburbs of Paris have attempted the cultivation of Witloof by the apparently simpler and more effective system of placing the roots on the manure instead of heaping the manure on the top of the roots. They simply cover the crowns of the roots with earth or mould to the depth of a few inches. But the shoots generally expand instead of remaining closed as in the Belgian Witloof. It appears that the pressure under which the growth takes place in the Belgian system keeps it hard and firm, and gives the whole the conical and solid shape which greatly assists in making it carry and keep well.

Witloof is now quite an adopted winter salading and vegetable in Paris; it can boast the success of a new favourite, while *Barbe de capucin* and Dandelion are to us old and well-established acquaintances. Still all three vegetables (although Witloof was mentioned in the excellent paper read by Mr.

Norman at the Vegetable Conference) are far less widely known in this country than they are on the Continent, and I think it is worth while to draw the attention of British gardeners and amateurs to plants which, as winter saladings, are in my opinion quite deserving of careful and extensive cultivation.

SPRING FLOWER GARDENING.

By Mr. W. INGRAM, F.R.H.S.

[Read April 8, 1890.]

ALTHOUGH it is said with some confidence that our spring seasons are colder, and that our climate, if not deteriorating, is not improving, as in theory, from the drainage of large areas and extended cultivation, it ought to be, those sensitive little thermometers of the floral world, spring flowers, seem to furnish an argument to prove that but little real change has taken place. The habits of growth and blooming implanted in remote times still cling to them, and thus tell us that the ancient springs were like our own. The gentle Primrose thus chronicles seasons of a time long past, and reveals their unchanged aspect to us.

My confidence in the observance of the season of bloom in spring flowers is unabated; in my long experience they have continued to appear and to brave the winds of March and untoward frosts of April, rejoicing in increased beauty in even partial gleams of invigorating sunshine, and if I have to complain of them it is that they exhibit too much trustfulness in our fickle seasons by appearing some weeks in advance of their ordinary time of flowering, as some of them have done this year.

I gather confidence in my advocacy of spring gardening when I recall the great results in decorative planting that may be obtained without the aid of artificial heat or glass, or forcing of any kind. The half-hardy plants of summer have their brilliance marred by heavy rains. This is far from being the case with spring flowers. I have often seen them covered with snow, and half obscured with hoar-frost, and yet rise uninjured from such bitter trials. Rain is as nothing to them.

Being asked, in the first place, to read a paper on spring bedding, I proposed instead the more comprehensive title of Spring Gardening, as one that would permit me to speak of many interesting plants ineligible for bedding purposes. The display of spring bedding plants generally takes place from the beginning of April to the end of May, but there are flowers that appear and pass away before that time, and amongst these harbingers of the opening spring are some of our most cherished examples of floral beauty, and even more welcome for their precocity than are those which appear amongst a crowd of others a month or two later.

For convenience I may divide spring flowers into three groups, the first consisting of the early-blooming kinds, those that commonly appear in February and early in March. The second will comprise those that succeed, and continue in succession, throughout the spring season. The third will include those plants which may be commonly employed in massing for floral display in beds and borders. The distinction between the bedding plants and the others is merely arbitrary. It may be said generally that the groups first named are impatient of frequent removal, and their blooming period individually is comparatively short, while those plants selected for bedding-out purposes possess a more active vitality and freedom of growth, and can be annually transplanted with safety, and even with advantage, and freely propagated both by seed and division.

The Christmas Rose family may claim a foremost place in my group of early plants. Although some of the Hellebores are really winter-blooming, they still belong to the spring from the duration of their flowers, while others have the merit of appearing in February and March. The kinds I find most useful are *H. niger*, and *n. angustifolius*, and *altifolius* or *maximus*. Added to these are some of the *orientalis* section. The Hellebores, like other free-blooming large-leaved plants, show a partiality for rich deep soil, and are benefited by a surface dressing of manure after the flowering period. Propagation by division may be successfully effected in March, except perhaps with the *orientalis* section, which flower much later than the *niger* group, and may be divided towards the end of April. The late Miss Hope, who was a good grower of the *niger* varieties, recommended as a suitable time when the leaves were at their

ripest. This would be in July. So there are really two periods when Christmas roses may be increased by division.

The Snowdrop, next in our list of early flowers, like Hellebores, has an autumn and a winter blooming species; but the majority belong to the spring, and I must not pass over a plant which, though so common, has never lost its interest and value in the eyes of all who visit gardens or woodlands as winter is leaving us. Our collection of Snowdrops has been enriched by some fine forms of this flower, *Galanthus Elwesii* discovered by Mr. Maw, and some varieties of *G. nivalis* amongst the number.

I think I have been told by Mr. G. Maw, our great collector and authority on the Crocus family, that flowering examples of Croci may be found in every month of the year. But many of the best known species are spring-blooming, and I introduce three which I may justly place in my group of very early flowers, of which *Crocus Imperati* is a type. These are prone to appear at a very early period of the year, being lured by the first gleam of spring sunshine. But it is too often the case that their beauty is marred by foul weather, but not invariably so. This season I had a mass of *C. Imperati* in bloom in February, and a charming effect was produced.

Whether I have been unusually fortunate in my method of propagating that charming plant *Anemone blanda*, or that I have been early in the race in securing it, I know not, but I have certainly succeeded in obtaining a large stock, raising some fine varieties, and convincing many of my friends of the great value of the plant for spring decoration. It is a plant that will not be lost to our gardens; it seeds freely, and I find it appearing, self-sown, in many places. It would be a great plant to naturalise in our woodlands, and would mix well with the wild Wood Anemone, *nemorosa*. The first gleam of spring sunshine awakens this little gem of the earth from its winter rest, and as the days lengthen it throws up a succession of its bright starlike blue flowers, and its season of bloom is longer than *A. apennina*, which produces a pale blue flower and is altogether widely different from *A. blanda*. It may be propagated by dividing the tuberous roots or raised from seed, which should be sown as soon as ripe. Light gritty loam with well-decomposed leaf-soil suits it best.

In gardening, while our admiration is perhaps too readily

given to gay and brilliant examples of the floral world, we have, I hope, sufficient taste to turn with pleasure to those diminutive plants that barely lift their blossoms above the level of the ground. Such Alpine gems as the spreading, the mossy, and the tufted Saxifrages have fortunately found appreciative admirers, and not uncongenial homes in our gardens, and I may specially mention *Saxifraga oppositifolia major*, *S. Burseriana major*, and *S. luteo-purpurea*, as not only plants of interest, but of beauty. A green carpet of vegetation is always pleasing to the eye in winter, and the system of spring gardening I pursue covers every open space of ground with different shades of verdure. The mossy section of Saxifrages helps me materially in this endeavour, and such examples of what is known as *S. muscoides coccinea*, which is a compact mass of bright green in winter, and in spring is dotted all over its surface with a profusion of bright red flowers, forms a charming feature both in borders and on rockwork. Of the Saxifrages the Megasea is a very distinct section of the family. It affords me two kinds for early spring, *S. ligulata* and *S. Stracheyi*; the former I employ extensively.

S. ligulata is perfectly hardy, but its handsome heads of bloom, lifted above its broad leaves, are not unfrequently injured by frost; but it is worth protecting on the occasion of severe frosts. It forms a good base or groundwork, planted in masses, for Hyacinths, and is a good vase plant. *Saxifraga Stracheyi* is more beautiful than the foregoing—its blossoms a delicate pink and white; but though early it is very tender. Anyone seeking for a perfectly unique effect, and taking the trouble to cover the plants occasionally with some slight guard, would be amply rewarded by the result in uninjured blossoms.

Scarcely a season passes without the discovery and introduction of some interesting plants to our gardens. One of the most beautiful hardy plants brought to us in recent years was found by Mr. G. Maw in the mountain region near Smyrna. It is called *Chionodoxa Luciliae*, and by the mountain people "the Glory of the Snow"; it scarcely waits for the snow to recede before it bursts into bloom. It might be presumed that a plant from such a position and country would be difficult to establish in Britain, but no imported plant I am acquainted with has so rapidly naturalised itself or proved more amenable to culture. There is

nothing that I can see to prevent it spreading far and wide over the country, and delighting our amateurs and cottagers with its lovely spikes of blue and white starlike flowers. Its bulbs increase and it produces seed in profusion.

There is no kind of gardening that tends more to popularise the pursuit than that which renders it possible to achieve considerable success in plant culture with small means. Amateurs and cottage-gardeners look with keener interest on a garden that includes simple hardy flowers, of which they possess the counterpart. Personal pride in the possession of a rare or uncommon plant is a strong feeling, and a grower of Pansies or Primroses is in sympathy or rivalry with another who takes pride in cultivating the same class of plants. Humble visitors to large gardens are very proud to be able to say that their Pansies or Daisies are as good as the duke's; and I may claim something for spring gardening on this score, that while it not only interests the great majority of people who care little for flowers, it enlists the direct sympathies of the very humble class of cottagers and artisans. Spring gardening is extensively practised in the neighbourhood of Belvoir, both in large and small gardens.

I suppose it is from sentiment that we look upon Heather in any shape with a certain degree of interest, and few plants attract more notice and remark than *Erica carnea*. In the early season it is perhaps the most striking feature in the spring garden; its masses of glowing crimson form a welcome contrast to the blue and white and yellow flowers which predominate at this period of the year. It is one of the family of Heaths that is a little less particular about peat than others, but I grow it extensively, and give it as much of that soil as I can afford, with grit and leaf-soil. There is a white variety which is well worth a place in the spring garden.

I have mentioned plants in this early section that are used freely, and give generally broad and fine effects, particularly when massed; but there are several plants that belong to the early spring that are either comparatively rare or difficult to propagate, or fugitive in their period of blooming. But I cannot omit mention of that brave little Narcissus, *minimus*, and its companion *nanus*—these are with me the first Narcissi to show their pretty yellow blossoms. That beautiful little shrubby plant *Polygala Chamæbuxus purpurea* has the merits of very early

blooming and endurance. *Hyacinthus azureus* is a gem of rather recent introduction. *Scilla bifolia* is always impatient to produce its lovely sprays of blue, but it passes away all too quickly. I may fairly include *Iris reticulata* in this division; it has thoroughly established itself at Belvoir, growing freely and blooming abundantly in beds of light loam and granite grit. A plant so perfectly hardy, and rivalling many Orchids in its rich colouring of purple and orange, should be in every garden. *Iris stylosa* is also beautiful and early, but its blooms are sparingly produced.

There is no plant better known or more highly valued than the Violet, and the Russian Violet may be said to belong to the winter as well as the spring, and no denizen of the early garden more readily responds to springtide warmth than the Violet, and no flower's appearance is hailed with more satisfaction. I cannot omit it from my list, and I need not dilate on the merits of a plant so well known, nor must I fail to record my sense of its value in spring gardening; its presence is felt in its fragrance. Its effective disposal is always worth consideration. I place it near the approaches to the flower-gardens, under trees, on banks, in borders, and in any sheltered place. The wild Violet loves the sunny side of the hedgerow, and that is a good hint for growers. I plant fresh clusters every year, and these are grown in the slips of the kitchen garden. It is a mistake, if you wish early and good blooms, to leave a plant for two years in succession in the same ground; its habit of throwing out runners tells that it requires change of ground. Bare spaces under large evergreen trees—Cedars, for example—might profitably be covered with Violets. My best beds are thus placed.

These floral results of our spring season may justly be a source of satisfaction to all interested in gardening. I have named, without exhausting our resources in early plants, about a score belonging to February and early March, and there are probably three times that number to be named for the two succeeding months, April and May; and I may say that my experience in the cultivation of these plants has not been gained in Cornwall or Devon, or even in Kent or Sussex, but in a north midland county characterised by a cold clay soil and great reaches of pasture-land, but the shelter of ranges of woodland has given advantages which equalise our position in some respects with exposed places in more favoured parts of England.

I may now enter on a period of the year a little more advanced, which includes part of March and the months of April and May. I need only cursorily mention the common and well-known plants, the cultivation of which is well known, dwelling more particularly on others of special merit or recent introduction—those not so generally grown.

If there is one group or family of plants more than another that deserves prominent mention, and claims the admiration of all growers of hardy plants, it is that of the Primula. From the modest Primrose of our wood to the noble forms from India and Japan, all are more or less charming and interesting, and there is just that little difficulty in growing some of them that gives a zest to the endeavour, and satisfaction as the result is favourable and success assured. The habits of our native and naturalised species afford us cultural hints. These delight in old woods in which vegetable matter has accumulated and decayed, generally on strong soil, so that immunity from dryness is indicated. I have resorted to a plan which is within the reach of most gardeners. I cover a space of ground in some half-shady spot, and make it the receptacle for one season of leaves, short grass, and a little stable manure. This is levelled when it accumulates to the depth of from 18 inches to 2 feet, and a layer of soil spread over it. In the second year this mass of vegetable refuse is generally rotten, and forms an acceptable bed for Primroses, Lily-of-the-Valley, and Hyacinths. *Primula denticulata* grows luxuriously on one of these prepared beds, and one of the gems of the early season, *Primula rosea*, thrives in a position that supplies congenial support and adequate moisture.

Only next to the Primrose in interest, and of very striking beauty, is the Anemone. The wild form, *A. nemorosa*, like the Primrose, delights in the shelter of woods, and grows freely in leaf soil, particularly when it rests on light gritty loam. Although other forms prefer open spots, there is a general preference shown by all the family for light friable loams enriched with thoroughly decomposed cow manure or leaf soil. I have found sea sand very useful in mixing with the soil of this locality, which is of a heavy nature. *Anemone coronaria* affords many valuable varieties for the spring garden; both single and double forms are strikingly handsome, and by planting early, flowers may be obtained throughout the spring months. The south of

France gives us one of the most brilliant flowers in *A. fulgens*. This genus also includes Hepaticas, than which there are no more desirable spring plants. *H. angulosa* is less difficult to increase than some of the others. Reverting to the *Anemone nemorosa* section, I may mention two invaluable kinds for general garden culture, one known as *A. Robinsoniana*, the other *nemorosa plena*, or double white.

I cannot pass the mossy and spreading Phloxes without favourable comment. They are ideal plants, both for rock-work and border, blooming profusely, and supplying tones of colour from pure white to delicate pink and red (colours very welcome in the spring). The species and varieties I employ are *amæna*, *subulata*, *frondosa*, *Nelsoni*, and the charming varieties raised by the late Mr. Nelson. They all enjoy a rich sandy loam.

Our resources in spring plants are not so ample that we can afford to be too critical, and amongst the flowers that might not hold a foremost position, when placed in comparison with some of the more choice or refined in character, is *Cardamine rotundifolia*. Nevertheless it has the several recommendations that it is hardy, has good foliage, is very early flowering, and floriferous, and its masses of white flowers produced by well-grown plants at once claim notice. It is of easy growth, and, like its family, is impatient of drought. *Cardamine pratensis fl. pl.* is a very handsome variety, and *C. trifolia* is a plant well worth a place in either borders or on rockwork.

There is a pretty little bulbous flower not so well known or commonly cultivated as the Scillas, but suitable for association with them, as it blooms about the same time as *S. sibirica*. It is perfectly hardy, and seeds freely. It is called *Puschkinia scilloides*. Like other small plants, the best effects are obtained from it when grown in masses. It is not pure white, but a little tinted with light blue; but it gives the effect of a white flower.

I have only mentioned two very early Narcissi, those belonging to my first division of early plants. Following closely on the appearance of *minimus* come *pallidus præcox*, *Stella*, *obvallaris*, *princeps*; and from March until May a succession of these beautiful and interesting flowers appear, making in themselves a spring garden. The Narcissus is effective, and lends itself to all kinds of positions and never seems out of place, but when disposed irregularly on grassy slopes, amongst rocks, or in clumps

of low shrubs, or under tall trees, the brightening effect it gives is generally excellent.

Neither time nor space will permit me to do more than briefly mention other plants which belong to the later spring season, which are of varying interest, affording variety to the borders or other positions to which they may be assigned. Amongst the most prominent may be named—*Alyssum saxatile*, *Adonis vernalis*, *Trillium grandiflorum*, *Orobus vernus*, *Erythronium dens-canis*, *Cheiranthus Marshalli*, *Corydalis cava* and *nobilis*, *Dielytraspectabilis*, *Doronicum excelsum*, *Pulmonaria azurea*, *Triteleia uniflora*, *Leucojum vernalis*, *Muscari* (the Grape Hyacinths), *Uvularia grandiflora*, *Ornithogalum nutans*.

In regard to the cultivation generally of herbaceous and spring plants, I venture to caution those who may be led to imagine that everything they desire may be accomplished in one season, as with summer plants. No expenditure of money can secure this. Nursery-grown plants are often necessarily small from being cramped in pots, and a large stock of healthy subjects for large effects can only be secured in the course of years. There is a point of maturity in the period of life of every plant when its best qualities are exhibited, and its power of resisting climatic trials and the attacks of insects is the greatest. This vigour belongs to some plants in the first year of their existence, to others in the second, to others at a greater length of time. To buy a plant in its declining time is to court failure, and immaturity may cause disappointment. We have all failed in our early trials, and even been led to condemn plants we have subsequently found of the first value and interest.

Browning says—

Oh, to be in England now that April's there !

I think it is generally conceded that there is a freshness, purity, and beauty in spring flowers, either in masses or grown singly, that give them a special attraction. Our arrangements hitherto have been made to secure an early garden of bloom, March and April being the months in which it was desirable our greatest display should take place; we have thus given less attention to Pansies and other May-blooming plants, though fully recognising their value. The system of bedding generally is gradually undergoing modifying influences, and is more

directed by artistic taste than formerly. The mere massing together of plants of one colour without the relief of variety was open to the objection—no other existed—of formality. This artificial arrangement seemed more particularly inconsistent with the freedom and naturalness characteristic of spring flowers. I propose to describe some of our bedding arrangements, the character and kinds of plants we employ, their propagation and general treatment. For spring bedding those plants must be employed that not only have the habit of blooming early, but may be relied on to maintain that bloom for some time, and in the selection it is necessary to choose those plants whose blooming period is coincident.

There is no better plant for spring bedding than *Aubrietia græca* and its varieties. It is perfectly hardy; it fairly covers the ground from the time it is planted in October until it is removed in May; its blooming period is prolonged through the spring months. We are indebted to Herr Max Leichtlin for two new and charming varieties, giving us colours that were much desired—crimson and pink; the common form is bluish lilac in colour. The *Aubrietias* are increased by cuttings, division, and seed. I give the preference to seedlings. The seed should be sown as early in the year as possible, and the plants pricked out; if properly treated the young plants will be ready for planting in October and November. The *Aubrietia* beds are relieved with white, orange, and red Tulips, and edged with light-coloured Primroses.

I employ that beautiful and free-blooming Heath *Erica carnea* for massing, the beds being edged with *Heuchera lucida*. Yellow Tulips are planted amongst the crimson Heather, suggesting a piece of wild ground with *Tulipa sylvestris* springing from it.

Another arrangement which is particularly pleasing consists of a dwarf variety of *Arabis albidia* with *Scilla sibirica* intermixed, and edged with red Daisies.

A hardy and early-blooming yellow Polyanthus is largely employed in our spring-bedding arrangements. These in masses give a very definite effect, but will still bear the relief of pink or scarlet Tulips; and an additional line of colour is lent by double pink Daisies.

Another yellow bed, but of a more bold and decided character, is made with *Doronicum austriacum*, edged with *Myosotis*

dissitiflora ; a central clump of *Doronicum excelsum* is also used in the case of large beds. These plants should be well grown, and should have a growth of two or three years.

One of our large beds has a central mass of dwarf yellow Wallflower dotted with blue Hyacinths, and its limits defined with *Myosotis* ; lines of pink *Aubrietia* and *Saxifraga muscooides* following.

A similar large bed is occupied chiefly with *Saxifraga ligulata*, which affords both flower and foliage ; and this plant makes a good base for Hyacinths, which spring apparently from its protecting leaves. *Arabis albida* separates this from the other lines ; these consist of Primrose, rosy-flush *Aubrietia*, and Alpine Daisy, a pretty bright semi-double member of the race, very hardy and floriferous.

A bed backed with *Rhododendrons* contains a line of massive plants of *Helleborus orientalis*, and is fronted with *Cardamine rotundifolia*.

Two Violet beds, even in April, are fragrant and effective ; one is formed by Marie Louise, the other Victoria Regina.

The bedding arrangements just named are found in a garden near the Castle. Passing to another, known as the Duchess's garden, situated in a sheltered bay on the side of the range of hills, on an outlier of which the castle stands, and entering this ground, it will be seen how much its conformation favours the formation of rockwork ; indeed rock crops out in the upper slopes, and the ground invites a system of terracing the abrupt banks, and still permits flower-beds on its grassy slopes. Trees and choice shrubs also form a notable feature.

On the hillside above the walk that traverses the garden there are Cedars, Hemlock, Spruce, and other trees. I am particular in mentioning this circumstance as I wish to invite attention to a practice I have successfully pursued of planting Violets and other spring plants, when properly grown and prepared, in October beneath the shelter of these evergreen trees on the side open to the south, and so likely to receive the benefit of the few glints of sunshine we may receive in the early season. The shelter afforded by large trees is considerable, and is enjoyed by many plants, but it is mostly necessary that they should be annually removed and replanted in the late autumn. During the winter and spring seasons we are never without Russian Violets

grown in this way. Beneath the spreading boughs of one large Cedar of Lebanon there are four large beds, one of Violets, one of Wallflowers, another of *Saxifraga ligulata*, which here escapes frost, and one filled with Arabis and Myosotis. One of our most striking beds is in the form of a Maltese cross, and is furnished with Heaths, Arabis, Aubrietia, Primroses, variegated Aubrietia, and Daisies; another, sheltered by an over-arching Arbutus, is filled with yellow Polyanthus, and one more is filled with Anemones and mixed plants. Near the entrance to this garden, where the ground falls abruptly away, are three tiers of terraced banks. The upper one has a series of ovals edged with *Euonymus radicans variegata*, and filled alternately with *Erica carnea* and *Aubrietia Leichtlini*; following the edging are successive lines of *Aubrietia grandiflora*, Arabis, and *Myosotis alpestris Victoræ*.

The next terrace has circular beds, in which the single and double lilac Primrose are planted, and *Aubrietia græca*, Primroses, and Viola Blue King follow in lines.

The third and lowest terrace is planted with lines of *Saxifraga ligulata*, *Valeriana Phu aurea*, Myosotis, and Primroses. The terraces are held up with stone, and are covered with *Aubrietia variegata*, *Herniaria*, *Cerastium*, *Antennaria*, and other spreading plants.

Passing through an arcade the main garden is gained. Here again there are three terraces which follow the curve of the ground.

The first contains a triple row of crimson Primrose, and successive rows of crimson Aubrietia, Auricula, Daisy, and variegated Aubrietia.

The second terrace is planted with Arabis, pink Aubrietia, Primroses, Myosotis, and Daisies.

The third is filled with yellow Polyanthus, *Myosotis dissitiflora*, Primroses, *Aubrietia grandiflora*, and Alpine Daisies.

There are ten large beds on the grassy slope below the terraces, all filled with spring plants, but generally of the same character as those previously described.

I have before remarked that our speciality consists very much in the early period in the spring, in which we secure a display of flowers. There is an advantage in this: we are able to clear our beds and fill them with half-hardy plants for

summer. It was once suggested to me that it might be possible to have a display, part flowers, part shrubs, at each season of the year, and, in fact, this has really been accomplished; our flower-beds are never bare or empty, and herbaceous borders and shrubberies never without bloom. Although I use and value both Hyacinths and Tulips, they are subsidiary and not the essential features of the garden. I use chiefly the single bedding Hyacinths, and the early Van Thol Tulips. In the general garden arrangements I cannot claim any great merit of originality; if anything can be said in commendation of the Belvoir Gardens it is that, by the use of many simple and well-known flowers, the flower-gardens have been made attractive and pleasing to the many visitors who, by the kindness of the noble Duke, have at all times and seasons the privilege of seeing them, and I have great pleasure in saying that the trust thus exhibited is rarely abused.

ROCKERIES AND ROCK PLANTS.

There are but few mountain ranges in the world that have not given us plants of more or less interest. Many tell us of the wide distribution of certain families, and suggest speculation and furnish clues to the geologist. Introduced to our gardens with the story of their mountain homes, it is no wonder that we resort to rockwork in the endeavour to imitate the natural circumstances that belong to the plants.

To carry on the recital of the narrative relating to our spring flowers, my task would be but imperfectly fulfilled if I failed to glance over our rocky banks, and to record the names of the plants which have happily established themselves on its recesses and declivities. It is hardly necessary to say that rockwork should be constructed chiefly with the view to give advantages to rock-loving plants which level ground fails to afford, and which are so much required to exhibit the best qualities of the plants in growth and bloom. It is always cool and moist under a block of stone, and one simple proceeding is to sink masses of rock slightly into the ground so as to form pockets to hold up soil. Other pieces may be so laid as to form ledges over which the trailing plants may freely ramble. Although *Gentiana acaulis*, *G. septemfida*, and *G. asclepiadea* can be grown in our herbaceous borders, they belong to the rockery, and are never out

of place on it ; neither are the Androsaces, which are only happy when they can root in the fissures of rockwork. *A. carnea*, *A. ciliata*, *A. lanuginosa*, and *A. sarmentosa* are amongst the best. I have already spoken of the dwarf Phloxes ; such as *P. reptans*, *P. amœna*, and *P. Nelsoni* are essential to the rock-garden. *Primula Auricula*, *P. pubescens alba*, *P. rosea*, *P. denticulata*, *P. cortusoides amœna*, and *P. nivalis* are amongst others desirable. *Cyclamen ibericum*, when fully established, is charming in leaf and flower. *Ranunculus alpestris* and *montanus* should not be omitted. *Linnæa borealis*, with its trailing ever-green stems and sweet flowers, lends special interest to any spot. The crimson variety of *Oxalis acetosella* is interesting as a native plant. Two species of *Thymus* are especially suited to clothe rocks with a dense and clinging growth ; these are *T. lanuginosus* and *T. Serpyllum albus*. *Lithospermum prostratum* has no rival in its class of blue flowers, although it is nearly approached by *Veronica rupestris*. *Tiarella cordifolia* spreads its dark handsome foliage over rocky ground, and is effective both in flower and leaf. *Hypericum reptans* is another creeping plant which bears large yellow flowers, and clothes any masses of rock within its reach. The Alpine Wallflower and *Cheiranthus Marshalli* are members of an interesting and well-known family. The Forget-me-nots, *Myosotis dissitiflora* and *M. alpestris Victoricæ*, should find a place in every spare corner. Plants to clothe an interesting rock-garden might be found formed of Saxifrages and Sedums alone : *S. oppositifolia* and *S. Burseriana*, *S. muscoides*, *Camposi*, *incurvifolia*, *Maweana* ; then the section represented by *crustata*, *Cotyledon*, *longifolia*, *Macnabiana* ; and even these scarcely represent the types of the hundred and upwards in cultivation.

SHRUBS.

The spring garden need not be restricted to annuals or perennials, but may derive material assistance from shrubs, of which the list I present is an example. Some few are better with the protection of a wall.

Daphne Mezereum.
Chimonanthus fragrans.
Lonicera fragrantissima.
Rhododendron dauricum.
 „ *Nobleanum*.

Rhododendron præcox superbum.
Andromeda floribunda.
 „ *japonica*.
Berberis Aquifolium.
Forsythia suspensa.

Magnolia conspicua.
Genista præcox.
Pyrus japonica.
Berberis Darwinii.
„ stenophylla.

Azara microphylla.
Amygdalus nana.
Ribes.
Kerria japonica.

These I have proved. I should like to call special attention to that very handsome evergreen *Azara microphylla*. It is now (at the beginning of April) in full bloom, but it makes its presence felt not by the attractive characters of its flowers, but by the wonderful fragrance they exhale. The garden is filled with an aroma resembling vanilla.

DAFFODIL CONFERENCE AND EXHIBITION.

A GREAT Exhibition of Daffodils was held at Chiswick on April 15, 16, 17, and 18, 1890, a Conference taking place on the second and third days of the show.

The exhibition was opened on Tuesday, the 15th, by her Royal Highness the Princess Mary of Cambridge, Duchess of Teck, at 3 P.M. Her Royal Highness, who was accompanied by the Princess Victoria of Teck, was received at the Garden gate by members of the Council and others, and having been presented by Miss Thiselton Dyer with a magnificent bouquet, entirely composed of different varieties of Daffodils, was conducted to the great vinery, which was filled from end to end with the flowers. Having carefully inspected the different exhibits, her Royal Highness was graciously pleased to declare the show "open," and expressed her great admiration of the flowers and the pleasure it had given her to see them.

WEDNESDAY, APRIL 16.

On the first day of the Conference the chair was taken at 2 P.M. by Professor Michael Foster, Sec. R.S., who opened the meeting as follows :—

I do not quite know why the greatness of presiding at this Conference has been thrust upon me, unless it is because I had some part in bringing about the first Daffodil Conference, which was held some six years ago, and at which I presided. We may, I think, congratulate ourselves on what has taken place since that time. If we look at the show here before us, we see what progress has been made in our favourite flower; and we have the satisfaction of reflecting—at least those of us who are Fellows of the Royal Horticultural Society—that while many on that occasion who were best known for their knowledge of the Daffodil were outside the Society, they are now gathered

into our fold. We then met in a place not our own, where our presence was a matter of sufferance; we are now meeting in our own grounds, and if not under our own fig-tree, at least under our own vine.

I do not quite know what to say in the form of an opening address on this occasion. Perhaps I may be allowed to say that the keynote of our meeting here seems to be that we are gardeners, that we are brought together because of our love of flowers, and that the object of our conference is to increase that love. There is an old saying of Goethe, in "Wilhelm Meister" I think, "Take care of the beautiful, the good and true will take care of themselves." The prime duty of this Conference is to take care of the beauty of the Daffodil.

We find in life that, in attempting to attain an end, we are often led into paths which seem indirect; and one way to take care of the beauty of the Daffodil is to take care of its names. The greater our love of plants is, and the more attention we pay to them, the greater is the necessity which arises for giving names. There is no such necessity for him who does not care much for Daffodils, and to whom a Daffodil is a yellow Daffodil and nothing more. If you show to such a person a wild *Pseudo-Narcissus* or the "Glory of Leyden," he will say they are both Daffodils. But we who are led more and more to take an interest in each individual form, and to make increasing distinctions between the several forms, are driven to the use of a number of names. Now in using names there are, I take it, two rules which we should adopt. The one is that a name should only be applied where it is necessary. In the case of all the forms occurring wild in nature a name is necessary, because these are, so to speak, the letters by which Nature spells out to us her lessons; and it is necessary that each letter should be recognised. Besides these forms which occur in nature we have a variety of forms produced by the hand of man—some by direct hybridisation through his own hands, some through sowing seeds which insects have fertilised. In this way we are gradually acquiring a large number of new forms, and the question arises: Which of these forms deserve names? I think I shall not be far from the right solution in saying that new names should be given only to those forms which on the one hand possess sufficient individuality, so that

they can be readily recognised as distinct forms by ordinary people, and on the other hand are more beautiful than, or differ in beauty from, their forerunners. If we were to attempt to express all the different forms by separate names, we should lead ourselves into endless confusion.

It is one of the objects of the Narcissus Committee, and indeed of this Conference, to determine which are the forms worthy of receiving distinct names. In regard, however, to less marked forms, those seedlings which come into existence and yet possess no adequately distinct features or merit, it is a matter of difficulty to know what to do with them. Some recommend that all such forms should be destroyed at once as soon as they appear, so that they may no longer trouble the world. For the existence of a form which does not bear the characteristics which its name implies is a source of great trouble; it is important that each form bearing a definite name should have distinct characters, so that we may know when we have the real form, and not merely something like it. It becomes, therefore, of great importance that the forms to which we attach names should be kept clean and pure; and on this ground alone there is something to be said in favour of destroying indistinct forms. It is true that when one is bid to do this one is tempted to reply, "Thou askest a hard thing." I well remember the pangs with which I consigned to the rubbish heap last year a number of seedling plants which I considered did not possess sufficient individuality to deserve distinct names. If such indistinct forms are to be allowed to live for any special purpose, they should be kept apart in some sort of curiosity garden, and not be thrown into circulation with names attached to them.

The second rule is that the name should, if possible, be one which can be easily written, one which can be easily read, and one which can be spoken, if not easily, at least without great effort. I believe that one of the objects of the Narcissus Committee is to ensure that names should be given on these two principles. There is another quality which it is desirable that a name should possess, and that is, the name should in some way indicate the nature of the object named. But though it is our duty to strive to attain this virtue in a name, the task is a very hard one.

So much for taking care of the names; but that is only

part of the duty of the Narcissus Committee, or of this Conference. When we love any object, there is hardly any knowledge concerning the object which does not interest us. And to those who love the Daffodil all knowledge which bears on the Daffodil is very interesting. Moreover, we desire to bring these plants to perfection, and to this end all knowledge must be of use. I dare say many of you have followed the discussion which has recently taken place in the gardening papers about the value of theoretical knowledge in relation to practical cultivation. I may congratulate Mr. Thiselton Dyer on having started a most interesting discussion, in the course of which many good suggestions have been made. If I might sum up the whole discussion with sententious brevity, I would say: All knowledge is of use if applied aright; no knowledge is of use if applied awry. I think I may assume with confidence that neither the Narcissus Committee nor this Conference will apply its knowledge awry, and that all the knowledge which we may gather here respecting our favourite the Narcissus will be profitable. We are prepared to receive all knowledge concerning it—such, for instance, as any information with regard to its natural history, or the state in which it exists in nature; also as much knowledge as possible about hybridisation, for this art often discloses the potentiality of the plant. Lastly, we are willing to learn everything we can of the way in which the soil should be prepared for the growth of the plant, and concerning cultivation in general. And I venture to think when you read the names of the gentlemen who have kindly offered to bring before you the results of their observations, you will feel sure that the knowledge which they will impart must prove of great value.

REPORT OF THE NARCISSUS COMMITTEE.

At the Daffodil Conference of the Royal Horticultural Society held in 1884, a resolution, proposed by Mr. Elwes and seconded by Mr. J. G. Baker, was passed, "That in the opinion of this Conference uniformity of nomenclature is most desirable, and that garden varieties of Narcissi, whether known hybrids or natural seedlings, should be named or numbered in the manner adopted by florists, and not in the manner adopted by

botanists." In order to carry out this proposition, a Committee was appointed to revise the names of new Daffodils; the whole of the varieties then known in cultivation were gone through, and English names substituted in most cases for the Latin ones which had been in use. A list was published containing the changes thus made, the varieties being grouped under the species given in the monograph of Mr. Baker. This list is in course of being checked by the Committee, but up to the present time they have not had the opportunity of examining living specimens of all that is described therein.

The Narcissus Committee held meetings in the months of March, April, and May in 1886, and each of the succeeding years, and the work which it has done, or had to do, may be described briefly under three heads:—

1. The acquisition of information as to the natural history of the Narcissus, native habitats and natural varieties, their cultivation and development. Special mention may be made of the following which have been introduced into this country since the date of the last Conference, either afresh or for the first time:—

Moschatus of Linnaeus, *nobilis* of Réduit, *cyclamineus* and *Johnstoni*, and large numbers of *Ajax* of different kinds, *Corbularia*, and *triandrus*, which have been imported and cultivated successfully. The wild forms have been found to vary to a much greater degree than was supposed, and in many cases a complete chain of forms may be shown connecting two typical varieties which used formerly to be considered totally distinct. Such, for instance, was the artificial division separating *triandrus* and *calathinus*, a division which it has been found impossible to uphold, and the latter name is now given to the large-flowered varieties of the former. As a paper will be read on the natural history of the Trumpet Daffodils, which will embody our knowledge up to the present time, it is unnecessary to dwell upon the subject here at greater length. A question having been raised as to the possibility of the conversion from single to double in flowers produced by the same bulb, experiments were undertaken to investigate the accuracy of the statement that under certain conditions of soil or climate this change could be effected. Bulbs were planted at Kew, in earth procured from certain localities, and although no change has been observed in the trial made there, yet sufficient evidence

has been collected to substantiate the fact that bulbs which at one time produced only single flowers might have previously produced, and might again afterwards under certain conditions produce, blooms in all stages of doubleness. In connection with this question seedlings have been raised from the variety known as *Telamonius plenus*, some of them single, some double.

In the year 1887 the attention of the Committee was called to a disease then very prevalent among Narcissi, described sometimes as the "rootless" disease, the results of which were so disastrous that attention was specially invited to the subject, with a view to ascertaining its origin and the means to be adopted for prevention or cure. Since then, however, there seems not to have been much general opportunity for observation, consequently no conclusions have been come to in the matter.

The second part of the work of the Committee is that connected with garden varieties, hybrids, seedling, and selected wild forms. Any such that are submitted are carefully examined, and if considered to possess sufficient distinctive merit are passed as standard varieties, and "registered" under a suitable name. A coloured drawing is made for reference hereafter, and a description of each, drawn up by Mr. J. G. Baker. Up to the present time fifty-four have been registered in all, including eleven registered yesterday, the names of which are given in the schedule attached. It must be clearly understood that the Committee do not attempt to deal in any way with Narcissi which can be described botanically as sub-species or typical forms, and to which Latin or Latinised names may be given.

The advantages of this method are that the nomenclature is kept in as regular and simple a form as possible; only the best varieties are sanctioned, and a check is placed upon the possibility of the same form being brought out and distributed by different people under different names. The decision of the Committee with regard to one of the white Ajax having been challenged in 1887, it was arranged to plant side by side at Kew all the white forms submitted, in order to prove whether, under precisely similar conditions of soil and climate, the variation would prove constant which was claimed for the different forms. These have been watched each year, and the result of the observation has been drawn up as a separate report (p. 295).

The third duty has been the identification of flowers sent by those who were doubtful as to the correct name, and had not the requisite means of reference or comparison for determining it. The numbers of letters received both from the trade and from amateurs show that this work has been appreciated and of value generally. Last year the Council of the R.H.S. granted to the Committee the privilege of recommending the award of a first-class certificate to Narcissi which might be considered worthy of the distinction. Hitherto this had been done by the Floral Committee, causing some confusion, because varieties were certificated before they had been before the Narcissus Committee for confirmation of name. The only variety recommended as yet for a certificate is *incomparabilis* "Lulworth."

The importance of the Narcissus and the work of the Committee must not be considered merely with reference to the place which the flower holds in the gardens of the many amateurs who cultivate it, but also with regard to the value of its position as a cut flower in the London and other markets, its production for this purpose forming an industry of some importance, and one chiefly confined to this country. This double interest has enabled amateurs and representatives of the trade to work together on the Committee, clearly to their mutual advantage. The number and beauty of the seedlings now being raised and brought forward render the work as important as ever, and it is hoped, when what has been done by the Committee is more generally understood, that they will obtain that confidence in their judgment which they have endeavoured to earn.

C. R. SCRASE DICKINS, Hon. Sec.

April 16, 1890.

SCHEDULE OF REGISTERED VARIETIES.

Pseudo-narcissus:	Major— <i>continued</i> :
Achilles.	Henry Irving.
Ard Righ.	Madame de Graaff.
Automedon.	Santa Maria.
Challenger.	The Czar.
Golden Plover.	Bicolor:
Troilus.	Camoens.
Vicar of Lulworth.	Dean Herbert.
Major:	Empress.
Distinction.	J. B. M. Camm.
Emperor.	John Horsfield
Glory of Leyden.	(Horsfieldii).

Moschatus :	Bernardi :
Minnie Warren.	H. P. Buxton.
Incomparabilis :	Tridymus :
Autocrat.	A. Rawson.
C. J. Backhouse.	Leedsii :
Gloria Mundi.	Acis.
Lulworth.	Beatrice.
Mary Anderson.	Duchess of Westminster.
Princess Mary.	Gem.
Queen Bess.	Madge Matthew.
Sir Watkin.	Minnie Hume.
Backhousei :	Barrii :
William Wilks.	Conspicuous.
	Maurice Vilmorin.

The following varieties registered this season will be confirmed next year unless objected to:

Captain Nelson.	Mrs. Walter Ware.
Duchess of Teck.	Nelson's Orange (Nelsoni
Golden Vase.	Aurantius).
Grandee (Bicolor Grandis).	P. R. Barr.
Lena.	Queen Sophia.
Madame Plemp.	Samson.
Miss White.	Sunset.

REPORT ON THE TRIAL OF WHITE DAFFODILS AT KEW, 1887-1890.

In answer to the request that as many forms of white Ajax Daffodils as were in cultivation should be sent to the Royal Gardens at Kew for the purpose of comparison with each other, after having been planted in the same soil and grown under similar conditions for more than one season, bulbs were received from different parts of England, from Scotland, Ireland, the Channel Islands, and from Holland. In the first year sixty-seven lots were planted, one or more bulbs in each, and labelled with distinctive numbers (the names of the senders and of the reputed varieties being withheld from notice during the trial), and in 1888 fourteen more lots were added. The observations of each member of the Sub-Committee who examined the flowers were recorded, and a comparison between these indicates the following conclusions :

1. That the "Moschatus" of the Dutch growers is the variety properly known as "Albicans."
2. That the variety which some call "Leda" is that which

others identify as "Tortuosus." No member of the Sub-Committee was able to point out two distinct forms which the two names should represent.

3. That "Cernuus" is liable to some variation, the extent and permanence of which require further observation.

4. That the variety registered provisionally as "Minnie Warren" retains its distinct character.

C. R. SCRASE DICKINS, Hon. Sec.

NOTES ON THE HISTORY OF CULTIVATED NARCISSI.

By Mr. F. W. BURBIDGE, M.A., F.L.S., F.R.H.S., M.R.I.A.

Introduction.

I THINK to-day we may do worse than begin with the poetry of the children—

Queen Daffodowndilly has come into town
In yellow petticoats, and a green gown.

It seems peculiarly appropriate to me that, dressed in her richest attire, Queen Daffodil holds her court for four days in this dear old Chiswick garden, sanctified as it is by many memories of the best. Hither, to the Horticultural Gardens, years upon years ago, before our springtide Queen was verily crowned, came Haworth and Herbert, Salisbury and Sabine, Sweet and Lindley, and many others who even then, in what to many of us are remote times, loved and admired the Narcissus for what it really was and is, viz., as the golden harbinger of the opening year. Or, in the words of the poet—

Herald and harbinger, with thee
Begins the year's great jubilee.

We shall not repine at the Cinderella-like ill-treatment our Queen of Spring had to undergo in the days of "bedding-out." The "bedding-out" fashion itself has been badly treated of late, and we are happy enough, and magnanimous enough, to-day to forget all wrongs, real or imagined, and once more we

bow the knee and lift up our hearts before the reigning beauty of the springtide, under the auspices of this evergreen institution, the Royal Horticultural Society of England. It is quite sufficient for most of us, and indeed most satisfying, to know that, in all their fresh young health and beauty, Queen Daffodil and Prince Narcissus are victorious and happy before our very eyes to-day. For once the illustrated book is vanquished, and even the nurseryman's catalogue, attractive as it is with picture or with the doings of the pen—for once, I say, they seem bare and barren to us, because Nature herself, at her very best, is here before our admiring eyes. This is a point I am anxious to emphasise—books and book-lore of the best are good, art or artist's work of the best is better, but Nature and art at their best, as we see them here to-day, are better than books or pictures, indeed quite unapproachable, as all who see this noble exhibition must allow. This is only another way of saying that the best record is inferior always to the best things; but however often before expressed, however well expressed before, it is yet a truism that may and must be preached or said for all time.

In all the world's progress we see evidence of a twofold motive power. First comes the poet, who as a prophet always leads the thought of the rest of mankind. The poet is a prophet because he instinctively feels what is right. He may be a musical poet like Wagner, a rhythmical poet like Tennyson, a prose poet like Ruskin, a pictorial poet like Turner or Leighton, or a garden poet like Brown or Marnock, but the main fact remains that the leading men now as of yore are the bards, and certainly the leading poets of Greece, and Italy, and of England have been generous in their praises of the Narcissus.

But we must also have working followers of even the most potent leaders, and here to-day is a gorgeous flower show made entirely, or almost entirely, by gentlemen like Mr. Walker, Mr. Ware, and Mr. Barr, men whose motto in life is "Work, not words." But if you go to the very root of this question, you will find a beautiful substratum of poetry in the lives and inner thoughts of these so-called practical men; and inasmuch as this is true, so you will find is the real and permanent value of their work. There are, of course, such things in theory as absolute

right as opposed to absolute wrong. There is truth absolute (= science) as contrasted with absolute untruth or error; but if you look closely and deeply into the matter, other things being equal or nearly equal, the poet is always found to be a reliable guide-post on the great highway of our lives.

The poet makes a statement, and lo! in succeeding years or ages, the man of science makes discoveries that prove its truth.

The practical gardener is often to some extent a practical poet also, and he actually feels by the higher instincts of his nature what is best under any given set of circumstances for him to do. And then, again, comes on the chemist or the physiologist, and it is they who prove the gardener's actions to have been right ones.

Now I want you to notice how divided are the modern poets as to the gender of the word Daffodil. William Cullen Bryant, for example, although American, agrees with the children's poetry in England, and says :

The Daffodil is our door-side queen.

Not so, however, Aubrey de Vere, who, speaking of the Daffodil, says :

Thou laugh'st bold outcast bright and brave.

And is it not Lydia Sigourney who likens the "Jonquil" to a crook-backed old beau?

Old Jonquil, the crooked-backed beau, had been told
That a tax would be laid upon bachelors' gold.

Classically, no doubt, Narcissus is masculine. Ovid settled that, although Pliny says the name is derived from "narces," or stupour; but, biologically, the poetry of the children is right, for Narcissus must have had a mother, and from the Daffodil as a mother species have sprung during past ages all the more highly developed Narcissi known to-day.

I had prepared as a part of this paper a list of poets and philosophers, of botanists and of gardeners, who have at different epochs, during the last three thousand years or so, been interested in our favourite Narcissus, but I fear it would be too long an infliction on you were I to read it now. Chronologically it ranges from Homer to Oscar Wilde. I know that some have

objected to the Homeric Hymns as not being actually the works of any particular man, but, if not actually Homer's work, the "Hymn to Demeter" is so beautiful for its own sake, and also so Homeresque, as to be well worth giving. I do not at all agree with modern scholars who try to split up the immortal Homer into fragmental nebulae. Both Homer and Sophocles mention the Narcissus for its fragrance, and there is no doubt but that the mention of Narcissus in the "Œdipus" refers to the "clustered Narcissus" (*N. Tazetta*, fig. 19, p. 367).

This is what the oldest and greatest poet of Greece says of our flower:—

And the Narcissus wondrously glittering, a noble sight for all, whether immortal Gods or mortal men; from whose root a hundred heads spring forth, and at the fragrant odour [thereof] all the broad heaven above, and all the earth laughed, and the salt-wave of the sea.—"Hymn to Demeter," 8-14.

The following extract is from the "Œdipus at Colonus" of Sophocles:—

Stranger in this land of goodly steeds, thou hast come to earth's fairest home, even to our white Colonus, where the nightingale, a constant guest, trills her clear note in the covert of green glades, dwelling amid the wine-dark Ivy and the God's inviolate bowers, rich in berries and fruit, unvisited by sun, unvexed by wind of any storm, where the reveller Dionysus ever walks the ground, companion of the nymphs that nursed him.

And fed of heavenly dew the Narcissus blooms morn by morn with fair clusters, crown of the great goddesses from of yore, and the Crocus blooms with golden beam.

Much of floral history must ever remain unknown. We may nowadays, for example, never know what was the favourite flower of Helen of Troy or that of the great Cleopatra, Egypt's fascinating queen; but no doubt both these great and beautiful women must often have seen the "clustered Narcissus" (*N. Tazetta*); and even if blue-eyed Helen did not, like Persephone, stoop to gather it from the grass of the Grecian meadows, it was more than probable that incense-loving Cleopatra, when tired of fiery Pomegranate buds, had often worn clusters of the Narcissus in her blue-black hair, just as do the wives and daughters of sunshiny Egypt and of Arabia to-day.

From poetry and speculation, and possible doubt, it is interesting to turn to a very matter-of-fact incident in the history of *N. Tazetta*, as found naturalised or cultivated in Egypt. In

1888 Mr. W. Flinders Petrie, while excavating in the cemetery at Hawara, found some floral wreaths, supposed to have been made by Greek residents in the land of the Pharaohs—not in the time of the Pharaohs, it is true, but certainly as early as the first century before the Christian era. One at least of these wreaths is almost entirely made of the flowers of the “clustered Narcissus,” as immortalised by the poets of Greece, and, being now preserved at Kew, those who care to do so may see with their own eyes actual blossoms of *Narcissus Tazetta* as culled in Egypt nearly two thousand years ago.

Then the earliest of Greek physicians used or recommended the roots of Narcissi for medical purposes; and in the making of funereal garlands we are absolutely certain that the blossoms of *N. Tazetta* were used by the Greeks at least in the century before the Christian era.

You may take it for granted that the Narcissus was one of the most highly prized of all the native flowers of Southern and Eastern Europe and Northern Africa at a very early date in the world's history, because all the earliest and greatest poets have mentioned it time after time.

The very earliest allusion I can find as to the culture of the Narcissus appears to have been made in the works of Theophrastus of Eresus (B.C. 374–286). As we have no proof to the contrary, I shall assume his Narcissus to have belonged to the genus so-called to-day, and what he says of it is this: “Its leaves spread on the ground like the Asphodel, but broader, like those of Lilies; its stalk is void of leaves, and bears at the top a herbaceous flower, and a large dark-coloured fruit enclosed in a membranous vessel of an oblong figure. This fruit, falling down, sprouts spontaneously, although some *gather it for sowing*. The roots also *are planted*, which are large, round, and fleshy.”

The Narcissi in the Literature of the Seventeenth Century.

We need scarcely wonder that the Narcissus was one of the earliest of garden or cultivated flowers, since its fragrance, its size, its colour, its exquisite form, and its timeliness, even in the wild or native state, are so remarkable; but it is not until we get down to the early sixteenth and the seventeenth centuries that we find out, by direct written evidence, how popular these flowers

had become. They were highly valued in that great and general renaissance which spread over Europe in Elizabethan and Shakesperian times. The French and Flemish works of the period are rich in illustrations and descriptions of these flowers. Dodoens, Lobel, Clusius, Passe, Besler, Sweert, and many others, all illustrate and describe these flowers. So also, in the merry England of those times, we find that Turner and Tusser both mention Narcissus and Daffodils, and Gerard and Parkinson devote pages to them, with many wood-cut illustrations. Parkinson, indeed, seems to have been one of the earliest of English authorities on these flowers, as he alludes to 96 species and varieties, and he arranges or classifies them in a decided manner in his interesting old folio, entitled the "Paradisus," a work now difficult to procure, but one which no Narcissus lover would like to be absent from his or her library. Green, Spenser, Shakespeare, indeed nearly all the poets of Elizabethan times, mention our flowers either as Narcissus, as Jonquils, or as Daffodils, and Gerard (1597) especially tells us that they existed in London gardens in great abundance.

As in Egypt and in Greece the Narcissus, so also in England the Daffodil, became a celebrated flower in the making of garlands, and they were also much used, as an old author tells us, for the decking up of houses and of taverns when the springtide was a-comin' in.

Daffodils, Native and Exotic.

There can be but little doubt but that the Daffodil is a truly English wild flower, and is, I believe, the only species really native to this country. Any traveller to-day on his journey from Paris to London might see the Daffodil fringing the fields and woods alongside the railroad all the way. It is especially abundant in the woods of Normandy, between Rouen and the sea; and it is also pretty plentiful in the southern counties of England. But the English people have always been especially fond of ransacking the world in search of its treasures, and much as they may have valued their native wild flowers, they also had a hankering after those of other lands.

Several kinds, including the "Double Roman," appear to have reached this country *via* Constantinople, while others came

via Spain, France, Belgium, and Holland at a later date. We are not quite clear how, or when, or precisely whence the "Spanish White" Daffodils first reached our shores. Gerard and Parkinson allude to them; and in France, Barrelier illustrated several kinds in his celebrated "Icones." Evelyn, in his "Kalendarium Hortense," especially recommends that the seeds of the "two lesser pale *spurius* Daffodils of a whitish green" should be saved in June for sowing, as they "often produce varieties."

Continental Narcissi—In Books and Pictures.

In French illustrated botanical works of the early seventeenth century we find our white drooping Pyrenean *N. moschatus* of to-day well figured, as also in old oil-paintings of flowers executed about 1612-20, and now in the Louvre,* or in the Musée des Arts Décoratifs.†

White Daffodils.

Salisbury mentions that two white Daffodils at least were grown in the gardens of Paris in the time of Henry IV. These he defines as *N. moschatus* (*Botanical Magazine*, t. 1,300) and *N. tortuosus* (= *N. moschatus*, *Botanical Magazine*, t. 924). These two kinds, as he further tells us, he saw worked in coloured silks on a fire-screen said to have been presented to La Belle Gabrielle by the king himself. Salisbury saw this embroidered screen at Fontainebleau in 1786, and below the plants, which were represented as growing out of the earth, was the legend or title "Coquelourdes-blancs, 1598."

I shall not say anything more as to these lovely white Daffodils, since Mr. John Bennett-Poë has kindly made the subject his own, and will tell us all concerning them. One thing, however, is very remarkable about them. How they were originally introduced to Ireland I do not know, but the fact is

* Narcissus lovers who may visit Paris should make a point of seeing No. 477, a picture in the Louvre by Zampieri, who painted the figures, and Segher's "Le Jesuit d'Anvers," who painted a wreath of flowers around them. No less than fourteen kinds are represented, including the Sulphur Hooped Petticoat, and the *N. moschatus* of the Pyrenees, and other rare species. The date is about 1620-1650.

† The two flower pictures in this gallery are dated 1614-15.

they have grown and thriven in old neglected Irish gardens better than anywhere else in the world. That they have seeded there spontaneously is also past disputation, and hence, no doubt, the variety noticeable among them to-day. I believe they are all cultivated seedling descendants of the *N. moschatus* of the Pyrenees, which, as we all know, is extremely variable in size and shape, and in tint or hue, and it also soon becomes larger under cultivation in our gardens.*

Haworth, in 1831, only knew of four varieties of white Daffodils; and our friend Mr. Barr could only find three of these in cultivation down to the year 1879 or 1880; but now the list is swollen to two or three dozen or more.

Bicoloured Daffodils.

The Daffodils of the *N. bicolor* group are less numerous, but quite as perplexing as those of the yellow or golden group, and we are by no means quite certain as to their origin. But we do know that two-coloured forms of Daffodil exist in a wild state, and no doubt our garden forms of *N. bicolor* have been evolved from these native varieties. In the Pyrenees there are forms of *N. muticus*, and of *N. variiformis* (or the so-called *N. nobilis*, of Maw, not of Rédouté), which have white perianth segments and golden trumpets, and the *N. bicolor* of gardens is not only possibly, but also most probably, a seedling from this source. Then there is, as we know, a form of *N. bicolor* found wild in Portugal, whence Mr. Tait introduced it a few years ago. It was called *N. bicolor lusitanicus*, and more recently was christened "Camoens" by the Narcissus Committee. It has narrower leaves, and is otherwise distinct from the old *N. bicolor* of Haworth, and of gardens to-day. No doubt the tendency to vary towards a bicolour, or to a more or less white state, is inherent in northern or in mountain forms of the Daffodil; even in England variations more or less bicolorous are found among the common yellows, and the so-called Bicester white Daffodils show a tendency to advance still further towards the white

* Some specimens of collected *N. moschatus*, exhibited at the Conference by Messrs. Veitch & Son, of Exeter, were very variable in this respect; and some of the blooms died off pink, or of a rosy-salmon shade, in a way analogous to the behaviour of "Mrs. Geo. Rundle," "Elaine," and other white and sulphur-coloured *Chrysanthemums*.

Daffodil stage; but we cannot venture to accept them as being quite free from a suspicion of garden origin.

Until negative evidence is forthcoming, I think we must consider *N. bicolor* of Haworth as a selection from either *N. muticus* or *N. variiformis*, and then look upon it as the parent, or co-parent, of all the seedling or garden bicolour varieties known to-day. It was grown by Herbert, as also by Leeds and Backhouse and Horsfield, all of whom had the good fortune to develop it to advantage from the florist's point of view. Mr. Backhouse indeed expressly tells us that, although *N. bicolor* "seeds badly, and is" (or was with him in Weardale) "deficient in pollen," he can add, "but from crosses of the other Daffodils with it, I have raised some of the largest and finest of the class." We get here a glimpse of the origin and history of *N. Empress*, *N. J. B. M. Camm*, *N. Emperor*, *N. T. A. Dorrien-Smith*, and other of Mr. Backhouse's fine seedling bicolour varieties, and his remarks as to the parentage of these kinds throw a lucid sidelight on the origin of Mr. Leeds's *N. Grandee* (*N. bicolor maximus*), as also on the production of Mr. John Horsfield's noble bicolour Daffodil which now bears his honoured name.

Golden Daffodils and N. Incomparabilis.

It is when we come to consider the yellow or golden Daffodils and the "Incomparables," however, that it verily seems as if chaos had come again. They are almost innumerable. But there are some so distinct and effective that we cannot absolutely neglect them. The finest and most stately and most golden of all, as seen at its best, is *N. maximus*. It is the *Narcissus grandiflorus* of Salisbury, who, in *Hort. Trans.* vol. i., p. 344, says it is abundantly wild in the mountains of L'Esperon. I believe it has been reintroduced from the French or Spanish frontier quite recently, but we must yet await further details, as there seems a doubt as to whether the bulbs were collected from a wild habitat or from a cultivated one. That *N. maximus* has long been in cultivation is amply proven by the figures of it which exist in "Theatrum Floræ" (1622) and in "Campi Elysii" (1702).

Another distinct variety (*N. obvallaris*), naturalised at Tenby, is also a puzzle, as no one appears to have found its Continental

habitat. It is supposed to have been brought to Tenby by a colony of Flemings, and singularly enough was found naturalised in Co. Wexford, Ireland, where also a colony of Flemings existed years ago.

The giant Peerless Narcissus called "Sir Watkin" has an obscure origin. It was found in Wales, and became popular in 1884, but how, or whence, it came to Wales no one now knows.

Then we have quite a number of Daffodils in Ireland the origin of which is unknown. Ard Righ, Countess of Annesley, Frilled Trunk or "Crom-a-boo," *princeps*, Rip Van Winkle, and others I need not now name. Of these *N. princeps* may originally have been imported from Italy, but at any rate it is naturalised abundantly on old sites, in parks and in gardens in many parts of Ireland, where, by the way, the common wild *N. pseudo-narcissus* of England is unknown as a wild species!

The six best yellow Daffodils are, perhaps, *N. Emperor*, *N. Golden Spur*, *N. General Gordon*, *N. maximus*, *N. Countess of Annesley*, and *Ard Righ*. Of these, the history of *N. Emperor* alone is known; of the remaining five there is nothing but traditional evidence left to us to-day.

My own view is that these so-called Irish Daffodils, or their progenitors, were introduced many years ago as garden flowers, just as they were introduced to England. The only difference seems to be that they have thriven better in Ireland, and in many cases have seeded spontaneously, and so reproduced themselves with some little variety. At any rate the fact stares us in the face that from Irish gardens a dozen or more varieties have been introduced to England within the last ten years or so that have so far not been discovered either wild or cultivated elsewhere.

Statistical Note on Cultivated Narcissi.

As bearing on the modern history of cultivated Narcissi, we may refer to Mr. Barr's catalogue of 1871, where, at page 11, we find only 13 kinds offered in the *magni-coronati* group, including singles and doubles, Hoop Petticoats, and all the white Daffodils of that date.

On turning to the same gentleman's list for 1888 we find 109 Daffodils in the place of the 13 only in 1871.

In the *medio-coronati* section for 1871 there are 13 species

and varieties all told, as compared with 132 species and varieties in 1888.

Again, in the third, or *parvi-coronati*, section in 1871 there are only 28 kinds (including *N. Tazetta*), as against 74 varieties in 1888.

Thus in 1888 we find a total of 315 varieties, as contrasted with 54 varieties all told in 1871.

But there are at least 500 distinct species and their varieties in cultivation to-day, the lists of 1871 having been swelled partly by wild plants introduced from abroad, but mainly by the enormous influx of garden seedlings from the Leeds, Backhouse, and other collections in England, and a few garden varieties from the Emerald Isle.

Popular Names of Sections.

I am very much interested in the question of popular names, and often regret to hear the popular names, as applied to the three great sections of the Narcissi, mixed up in a haphazard kind of way. A Daffodil, for example, is a kind of Narcissus, but a true Narcissus is not a Daffodil. The true Daffodils are the large trumpet Narcissi, which Haworth included in his genus *Ajax*. The "Hoop Petticoats," or *Corbularias*, are rush-leaved Daffodils.

The true Narcissi have long and slender tubes to their flowers, and their stamens are inserted near the mouth of the tube in two series; their filaments are very short, so that the anthers seem to be sessile; while in the obconical tube of the Daffodil the stamens are in one series, and the anthers are borne on long stalks or filaments, which are inserted low down inside the tube near the seed-vessel or ovary.

Then the "Jonquil" Narcissi are those true species and varieties of Narcissi which have slender green and rush-like leaves.

Seedlings and Hybrids, with Notes on the Principal Raisers.

When we come to consider the seedling and the hybrid Narcissi we enter upon enchanted ground; and it is curious to find that the very first variety ever reared from seeds with the

identity of which there is any direct evidence in print was a double Daffodil. It was raised by John Parkinson in his London garden, and is called the "Double Spanish Bastard Daffodil" at page 103 of his "Paradisus in Sole," wherein he thus speaks of it: "I think none ever had this kind before myself, nor did I myself ever see it before the year 1618, for it is of mine own raising, and flowering first in my garden." At page 104 he further says of it: "It is risen from the seed of the great Spanish single kinde, which I sowed in mine own garden and cherished it until it gave such a flower as is described." This extract is worth quoting as showing that seedling Narcissi really were now and then reared by the early seventeenth century gardeners. As to hybrid Narcissi, they do not appear to have been artificially produced in gardens until a much later date; but that they were produced naturally in the native habitats of the Narcissi then, as now, is too well established to be for a moment doubted. Varieties of hybrid origin are figured by several old authors, and in such works as De Brys and Sweert's "Florigelia," in the "Theatrum Floræ," in the still earlier "Jardin du Roy," and at least one or two are rudely illustrated by Parkinson himself. In a word, man had in Herbert's time only just begun his apprenticeship as a marriage priest in the garden, but the bee and the butterfly had been busily improving the world's wild flowers for thousands upon thousands of years, and these insects must be credited with having made the Narcissi a puzzling study long before any of the now numerous garden hybrids appeared.

I believe I am right in saying that the first hybrid Narcissi artificially reared in English gardens were produced by the late Hon. and Rev. William Herbert (afterwards Dean of Manchester) at Spofforth in Yorkshire. In the *Botanical Register* for August 1843 several of these hybrids are figured and described. One variety, which he tells us is the result of crossing the wild Yorkshire Daffodil with pollen of *N. poeticus*, is a form of *N. incomparabilis*. Another is the produce of *N. incomparabilis*, fertilised by the pollen of *N. poeticus*, and is called *N. Spofforthiæ*, a plant most nearly represented nowadays by De Graaff's seedling named *N. Burbidgei* "Little Dirk."

Other curious instances might be brought forward, but it will be better for those most interested to read every line Dean

Herbert ever wrote—and he wrote much—on this question of hybridisation.

*Herbert's Hybrid Narcissi, as illustrated in Edwards's
"Botanical Register," 1843, plate 38.*

No. 1. *N. Diomedes* var. *Crichtoni*. From seed of *N. minimus* (*Bot. Mag.* t. 6) by the pollen of *N. Tazetta* (=Hermione) *aequilimba* (of Malta v. *Herb. Amaryll.* pl. 48).

This is a form of what we call *N. tridymus* to-day, with a twin-flowered scape; perianth chrome yellow, chalice deeper chrome.

No. 2. *N. (Ajax) pallidus*. A seedling from *N. minor*, fertilised with pollen of *N. moschatus*. The result is a flower very similar to the wild Daffodil of England.

No. 3. *N. Spofforthiæ*. Raised from seed of *N. incomparabilis* fertilised by pollen of *N. poeticus*, v. *stellaris*, a pretty flower, resembling *N. Burbidgei* "Little Dirk" (De Graaff).

No. 4. *N. Spofforthiæ*, var. *spurius*. Reared from seed of same capsule as No. 3, and resembling a poor pale form of what we now call *N. Barrii*.

No. 5. *N. (Queltia) incomparabilis aurantius*. This is a showy flower, white, with an orange-rimmed chalice. It was raised from seeds of *N. pseudo-Narcissus*, v. *eboracensis*, crossed with pollen of *N. poeticus stellaris*.

No. 6. *N. (Queltia) sub-concolor*. A seedling from *N. (Ajax) minimus*, fertilised with pollen of *N. poeticus*, v. *stellaris*, similar to No. 4.

In the paper from Herbert's own pen, accompanying the plate of the above six varieties, he incidentally mentions that he commenced his collection of the known Narcissi at Spofforth, in 1835, when preparing his work on the Amaryllidaceæ.

Far from claiming priority for his own experiments, Dean Herbert, after looking over the engravings of Narcissi in the works of the early seventeenth century, came to the conclusion that some old gardener had reared cross-bred seedlings even at that early date, or seedlings that had been fertilised by insects or the wind. Of course it may so have been, although my own

idea is that the hybrids of the old books were natural ones brought into gardens from their native European habitats, just as we obtain our * *N. Johnstoni* and *Bernardi*, varieties of to-day.

Herbert tried all he could to encourage practical work in this new field, as the following extract will testify: "It is desirable to call the attention of the humblest cultivators, of every labourer or operative who has a plot of garden or a ledge to his window, to the infinite variety of Narcissi that may thus be raised, and most easily in plots at his window, if not too much exposed to sun and wind, offering him a source of harmless and interesting amusement, and perhaps a little profit and celebrity."

Although Dean Herbert was first in the field, and by far the most philosophical of all his compeers interested in Narcissi, yet he was closely followed by others in this interesting work of creation. Thus we find that prior to 1850 Mr. Edward Leeds, of Longford Bridge, Manchester, had reared at least six very distinct and curious hybrid or cross-bred Narcissi.

After considerable experience in rearing Narcissi, Mr. Leeds wrote: "There is no end to the varieties and elegant forms that may be obtained"; and I think to-day, nearly half a century after he penned those words, we may say that the same is true, and that we are as far off the end of the journey as ever.

It has many times, and by many people, been taught that Mr. Leeds and Mr. W. Backhouse were induced to rear seedling Narcissi by Dean Herbert's example and precepts, to which I have before alluded. I am well aware that Mr. Backhouse alluded to Herbert's writings, and that they were well known to Mr. Leeds is quite certain, since he alludes to them at least once in the *Gardeners' Magazine of Botany* (Moore and Ayre's) for 1850. My own opinion is that Mr. Leeds, however inspired, had commenced raising cross-bred Narcissi before Herbert's remarks appeared in 1843-7, since, when his own seedlings were illustrated and described in 1850-1, we are distinctly told that he had been engaged in rearing seedlings many years before that date. Be that as it may, certainly one of the most interesting of all

* The Rev. G. H. Engleheart has quite recently flowered a remarkable garden hybrid of this group. It is a seedling between *N. Emperor* and *N. triandrus albus*, and, apart from its own merits, throws a strong light on the natural origin of the wild Spanish varieties of *N. Johnstoni*, &c., &c.

historical details in connection with seedling *Narcissi* is the manner in which Mr. Leeds's progeny came into the market. When in failing health, about 1874, he decided to sell his entire stock, and wrote to Mr. Barr about them, asking £100 for his collection, saying that if they did not realise that sum he would destroy them by "digging them in." Eventually Mr. Barr, and the late Rev. J. G. Nelson, Mr. Burnley Hume, Mr. G. J. Brackenridge, and Mr. H. J. Adams, subscribed the amount of the purchase-money, and thus the collection was saved to science and to our gardens. The result was that the Leeds seedlings came into commerce and general cultivation instead of being lost or destroyed.

These six varieties are fully described, and two coloured plates are devoted to their portraiture, in Moore and Ayre's *Gardeners' Magazine of Botany*, vol. iii., plates 169 and 289.

The varieties are as follows:—

1. *N. poculiformis elegans* (now called *N. Leedsii elegans*), a seedling from *N. montanus* crossed with pollen of *N. poeticus angustifolius*.
2. *N. Leedsii* (now called *N. "Figaro"*), an orange-cupped variety of *N. incomparabilis*, obtained by crossing *Daffodil major* with *N. poeticus*.
3. *N. major superbus*. Supposed by Mr. Leeds to be a seedling from *Daffodil major*, or *maximus*.
4. *N. aureo-tinctus* (now called *N. incomparabilis "Fair Helen"*), origin not certainly known. Mr. Leeds thought it a cross from *N. propinquus* with pollen of *N. odorus*.
5. *N. incomparabilis expansus* (now called *N. "Bianca"*), from *N. major* by pollen of *N. poeticus*.
6. *N. bicolor maximus*. From *N. bicolor* crossed with *N. propinquus* or *N. maximus*.

Our history of raisers would be incomplete without a word as to Mr. John Horsfield, a Lancashire weaver, who raised the celebrated and noble bicolour *Daffodil* which bears his name. It is supposed to have been raised about 1845, or about ten years before Horsfield's death, when the stock of thirty-seven bulbs, large and small, were sold, twenty-eight of them realising one

shilling and sixpence each. Unfortunately Mr. Horsfield left no history of his pet Daffodil, but the tradition is that he had *N. bicolor* in his garden, hence it has been assumed to be a seminal descendant of that variety, maybe fertilised by pollen of another kind. That Horsfield knew something of hybridisation is proven by his having previously reared a hybrid Tigridia, having for its parents *T. pavonia* and *T. conchiflora*.

Another of the pioneers in rearing seedlings was the late Mr. W. Backhouse, of St. John's, Wolsingham, Durham. His seedlings are many, including some of very fine quality, such as Empress, Emperor, J. B. M. Camm, C. J. Backhouse, and many others.

Mr. Backhouse published a few most interesting notes in the *Gardeners' Chronicle*, 1865, and he therein refers to the crosses between the Daffodil and *N. Tazetta*, from which *N. tridymus*, *N. Backhousei*, &c., have been derived. These are the four men whose names will go down to posterity as the prime movers in the artificial variation of the cultivated Narcissi, they having done in the garden what the insects do on the mountain-side or in the meadow.

Nowadays one may say nearly all the cultivators of these flowers also rear seedlings. In Holland Messrs. de Graaff have done great things, and their bold and beautiful Daffodil Mme. de Graaff so far stands at the head of the list in its way. Mr. Wilks, Mr. Engleheart, Mr. J. Allen, Mr. Barr, Mr. Max Leichtlin, Mr. Hartland, and Messrs. de Graaff, not to mention many others, are now doing their best to emulate the doings of Backhouse and Horsfield, and some of their results are here to-day for direct comparison with the older kinds.

THE PROGRESS OF THE NARCISSUS CULTURE IN THE ISLES OF SCILLY.

By MR. T. ALGERNON DORRIEN-SMITH, F.R.H.S.

TWENTY-FIVE years ago some eight varieties of the Narcissi were growing in the Isles of Scilly, besides those in the Abbey gardens, some almost wild, some in the hedges, and some in the gardens attached to the little farms.

These varieties were: *Telamonius plenus*, *odorus major*

(Campernelle), *Tazetta ochroleucus* (Scilly white), *Tazetta aureus* (Grand Soleil d'Or), *Tazetta* Grand Monarque (two vars.), *biflorus*, *poeticus fl. pl.*, and *poeticus recurvus*.

The date of the introduction of these is extremely obscure, except *Campernelle*, of which two bulbs were presented to Mrs. Gluyas fifty years ago by the captain of a French vessel, and her son now holds the largest stock. The others were introduced probably by the Governors, the largest stock being found around their "country seat" at Holy Vale, St. Mary's, or they may have been introduced by the monks residing at Tresco (these monks belonged to the Abbey of Tavistock, and were of the Benedictine order). There were most of the above varieties growing in the Abbey gardens in the vicinity of the old Abbey ruins, as well as many other varieties which had been introduced since 1834 by Mr. Augustus Smith. It occurred to him, seeing the *Narcissi* growing so early and so luxuriantly, that they might be a useful article of export from the islands. He advised some of his tenants to send them up for sale to Covent Garden. He sent up the first lot himself about 1865, which realised £1.

For some years the cultivation was confined to the Abbey gardens, to Mr. R. Mumford of Holy Vale, Mr. Trevellick of Rocky Hill, Mr. Gluyas of Old Town, Mr. T. Mumford of Newford, and a few others. The demand for flowers was not so great as at present; indeed, when first I came to reside in the islands they did not realise a sufficient amount to go into the culture to any large extent. It was not till ten years ago that it became thoroughly remunerative, and even then a very small quantity was sent to market.

In the year 1883 I went to Belgium, Holland, and the Channel Islands to learn as to the culture, and to judge for myself as to the probability of our working the industry successfully. In the Channel Islands they had turned their attention chiefly to Grapes, Potatoes, and vegetables. There was no great stock of *Narcissi*, nor did they go in to any great extent for flower culture. Belgium and Holland were a month later than Scilly, so that I considered it safe to embark more extensively in the culture than before, and bought largely for myself and my tenants. The exports rose to 65 tons in 1885, 85 tons in 1886, 100 tons in 1887, 188 tons in 1888, and 198 tons in 1889.

We formed a bulb and flower association in 1885 to promote

the culture, and held annual shows under its auspices, and the flower show is now quite the event of the year in the island. The first year the exhibitors had to be satisfied with myself and my gardener (the late Mr. Vallance) as judges, but since then they have had the advantage of the professional opinion of one of the Messrs. Barr and a member of Mr. Ware's firm as judges.

The contrast between the first show and the one held this year was most remarkable. There were over 700 exhibits this year, and they were so good that, on the advice of a friend, I ventured to send the prize flowers and others to her Majesty the Queen, who was graciously pleased to accept them.

With the export of bulbs we have not been so successful, and up to the present we have been unable to find a good market for the large quantities we should now be in a position to export. I have sent some gratis to the market growers around London, to America, to New Zealand, &c., but so far they do not appear to take. Most of our farmers have studied the way to grow good sound marketable bulbs. Our association has held two or three summer shows of bulbs, and on the last occasion some were produced as sound and as hard as any that ever came out of Holland. It may sometimes happen that we cannot thoroughly ripen the bulbs, owing to a wet season, as was unfortunately the case the year I sent out the largest number (1888); this applies equally to bulbs from Holland, and that year Dutch Narcissi were as deficient in power to stand forcing as ours were. But this is more particularly the case with the Polyanthus varieties.

The very high railway carriage is a great drawback; they are classified too highly in railway rates. There is no reason why they should pay more than late Potatoes, or any other vegetable not of a very perishable nature, whereas they are charged three times as much.

The Narcissus fly (*Merodon equestris*), or rather the grub of the same, has given us a taste of its powers, though I think, if it were likely to become thoroughly acclimatised, we should have had a severer example of its voracity ere this. It seems to have the most extraordinary proclivity for selecting the most valuable bulbs. I first obtained it in Sulphur Kroon from Holland; it has since attacked Sir Watkin, *Barrii conspicuus*, C. J. Backhouse, and *Nelsoni major*, but very little else. Do Barr's five-shilling bulbs taste sweeter than others, I wonder?

It is very seldom that we get any curious sports from the bulbs. I have on two occasions got a single and double *obvallaris* on the same bulb, and once a single and double *incomparabilis*; these I sent for inspection to Mr. Wolley-Dod.

The majority of varieties of Daffodils or Narcissi do well on these islands. There are, of course, some exceptions—*C. monophylla*, *pallidus præcox*, *triandrus*, and *calathinus* die out; *major* and *maximus* do not flower freely; *Corbularia citrina* and *Capax (cystettensis)* diminish. The *cernuus* varieties do not improve. Emperor, Empress, and the bicolours are as good as can be grown. *Obvallaris* is sometimes subject to a disease, but, on the whole, is improving. *Spurius* and Ard Righ looked sickly, but are now becoming acclimatised. *Rugilobus* is sturdy. *Telamonius pl.* in some years cannot be surpassed for colour, though the flowers are occasionally green in situations which do not suit them.

All the *incomparabilis* section do well—Sir Watkin grand. I have never seen such colour as we get in C. J. Backhouse, *Barrii conspicuus*, and other of the crimson-rimmed varieties. *Odorus fl. pl.* (Queen Anne's Double Jonquil), blooms in perfect proportion and colour. Orange Phoenix and Sulphur Kroon are very pure and large; they were difficult to grow at first, but are now improving.

The *Tazettas* are quite at home and in their glory; Grand Monarque especially has most magnificent heads. Bazelman major does not increase. The colours of Soleil d'Or, when left to maturity, are very rich. *Orientalis* (Muzart) is good. *P. ornatus* and *recurvus* do as well as possible. In *poetarum* the eyes are very rich. The *Burbidgei* section is beautiful, and very pure in colour, but too flimsy for a marketable variety. The great feature in all the flowers is the purity and intensity of colour; whether this is caused by the salt in the air, or by a porous soil, which does not long retain the moisture, I cannot say, but certain it is we are unusually favoured in this respect.

The flowers of the Narcissi are nearly all picked before they are thoroughly out, as it is found that they open larger and finer in a damp atmosphere of about 70° than if they open naturally in the air, exposed to the winds and the rain. Of course, this may be carried to extremes, and one occasionally hears of flowers being boiled; but this will have its own remedy. After taking

the flowers out of this temperature, they are tied in bunches of a dozen stalks each, mostly by girls and women, and then put into water, and on the morning of departure are packed in single layers in small wooden boxes.

I cannot speak of the best sorts of manure for the bulbs with any degree of certainty. Some will take any amount ; to others manure is death ; some like seaweed, others will not stand it. Speaking generally, the stronger-growing varieties will take manure in a decomposed state with advantage, while in dealing with the weaker sorts manuring should be avoided.

The rapid increase in the export between 1887 and 1888 made it evident that the flower traffic would soon be beyond the carrying capacity of the steamer. There had been over ten tons in a day then ; so that in 1889 a larger steamer had to be built, longer, broader, and drawing more water. This necessitated a considerable addition to the pier, thousands of tons of granite were put into the sea to export frail and delicate flowers ; otherwise the flowers would constantly have to be shipped overnight, and remain in the hot hold of the steamer sixteen hours before starting, to their great detriment, the old pier being tidal. The addition to the pier was made and completed in time for the traffic of this year, this extension, with the original pier, costing £14,000. Up to this year, while the trade was in embryo, no pier dues whatever for flowers had been charged ; but before the extension was decided on, the inhabitants were asked if they objected to pay ordinary pier dues, including 6*d.* per cwt. on flowers. There was no objection raised, and the extension was in consequence made in answer to the unanimous desire of the islanders.

With this considerable capital invested there is very little chance of the pier paying a reasonable percentage ; while, in the event of the traffic failing, the present owner has to bear the whole of the risk. The original through carriage to London was 9*s.* per cwt. Two years ago I negotiated a reduction to 7*s.* 6*d.*, so that, with the present pier due of 6*d.* added, it costs 1*s.* per cwt. less to send flowers to London than it did two years ago.

There is no sign at present of any diminution in the demand for flowers ; but we may, of course, be defeated in the end by foreign competition, as many other English trades have been. The prices will have to be considerably lower before it becomes

wholly unremunerative. We have got our stock of bulbs, and have therefore obtained a considerable start of others.

Let us consider, in the event of a failure, how we should fare. Before the industry commenced there was very little shelter and no glass I may say. Now the essence of flower-growing is shelter, and shelters—Escallonia, Euonymus, and Veronica hedges—are becoming general all over the islands, and glass is on the increase; so that if the trade fails, our islands will not be unsheltered and exposed to all the winds of heaven (they say there are five here, N., E., S., W., and one from above), but we shall have sheltered islands from all save the fifth wind, and plenty of glass ought, I think, to stop that, and we shall then be in a position to take every advantage of the mild and temperate climate which has been given us.

It will be a curious thing if an industrious, thrifty, and contented population cannot manage to turn these advantages to account, and so be enabled to carry on the welfare and prosperity which at the present time smile upon these islands, and which I hope, under Providence, may long continue.

SEEDLING DAFFODILS.

By Rev. G. H. ENGLEHEART, M.A., F.R.H.S.

I MUST ask you to kindly pardon the fragmentary and “off-hand” character of my brief discourse, for it so happens that I have of late been occupied with other things than Daffodils, and have therefore been unable to prepare a paper for this occasion. Fortunately, however, the great variety of flowers here before us, and the yearly addition which is being made to our stock of knowledge by the increasing number of workers among the Narcissi, make it not difficult to say a few words which may prove of some interest.

Our knowledge of the results of cross-fertilisation, and therefore of the certain or probable origin of the existing hybrid forms of Narcissi, is rapidly advancing. It is not long ago that we could speak but dubiously of the parentage of certain varieties in the collections of Messrs. Barr and others, to whose parents we can now point with great confidence. It is true that Herbert,

early in this century, effected and kept a record of many crosses ; but his flowers were by no means all figured, and appear to have either perished or been merged in other collections, so that their identity is uncertain. The accounts left by Messrs. Leeds and Backhouse of their work, though interesting, is not fully detailed, and is at present being verified and supplemented by modern experimenters—*e.g.*, I have, from my own work, no doubt whatever that Mr. Backhouse's Emperor is an enlarged seedling from *N. lorifolius*. Those of you who have access to the Society's *Journal* will perhaps kindly refer to a paper upon the subject of seedling Daffodils which I read in April 1889, so that I need not again pass over quite the same ground. And with regard to the history of the work done by our predecessors in raising seedlings, I there made reference to some excellent and almost exhaustive papers written by our friend Mr. Burbidge.

Of new cross-bred Narcissi flowered since we met last year, I may instance a pretty and interesting hybrid raised by Prof. M. Foster, between the white Hoop-petticoat and *N. triandrus*, and a curious little yellow, clustered, sweet-scented flower of my own production from *N. pseudo-narcissus* var. *spurius* × *N. Jonquilla*.* The latter hybrid belongs to the *N. tridymus* group, and must be classed very near to *N. muticus* × *N. juncifolius*, which is found occurring naturally on the Pyrenees. It is an excellent example of a precisely "half-way" offspring from two strikingly different parents. The father has from four to six flowers on a stem, the mother but one ; the child has three. In size of flower and breadth of leaf the seedling stands just midway between the parents ; the yellow of the mother is a little brightened by the father's more brilliant colour, and the mother's scentless flower is replaced in the offspring by a flower distinctly Jonquil-scented, but less powerfully so than the Jonquil.

In looking at the host of Narcissi spread out for us here

* *Note*.—Since the foregoing address was spoken, the following hybrids, among others, have flowered in Rev. G. H. Engleheart's garden :—

N. poeticus ornatus × *N. Tazetta Bazelman major*, a three-flowered scape of creamy-white flowers with red-edged eye, approaching the *poeticus* in size (Botanical Certificate and Award of Merit R.H.S. 1890).

N. moschatus of the Pyrenees × *N. triandrus* } interesting as showing
N. Emperor × *N. triandrus*. } the certain parentage of
N. Johnstoni, which they closely resemble in structure.

N. bicolor × *N. poeticus* in variety = *N. Nelsoni*.

N. incomparabilis × *N. poeticus recurvus*, yielding new forms akin to *N. Barrii* and *N. Burbidgei*.

to-day, you will notice that over one-half—probably quite two-thirds—belong to the large section in which the central part of the flower is much shorter and shallower than it is in the Ajax or trumpet Daffodils—is rather a crown or an eye than a trumpet. This large section has been subdivided into several sub-sections, according to the varying length or brevity of the crown in proportion to that of the perianth or outer division of the flower. In order to simplify my language, I will for the moment merge the names of these sub-sections, such as *Barrii*, *Burbidgei*, *Backhousei*, *Nelsoni*, &c., in the one older term of *incomparabilis*—the Incomparable or Nonpareil Daffodil of our old gardeners. It was long ago guessed by Herbert, and proved by his experiments in hybridising, that this shallow-cupped Daffodil is no species “one and indivisible,” but the outcome of a cross between the trumpet Daffodil and the Pheasant-eye, *N. poeticus*. The truth of this has been amply corroborated by the productions of Leeds and Backhouse, and I am able to state that I have in my own garden raised these “Nonpareils” in considerable variety by bringing about intermarriages between various trumpet Daffodils and the *poeticus* Narcissus. The great variety of shape and tint which you observe in this large group of short-crowned Narcissi is easily accounted for, as is also their extended season of flowering. It is a purely arithmetical reckoning. Given some hundreds of forms of Ajax or trumpet Daffodil, of which no two are precisely alike in colour, form, or substance, and a dozen kinds of Pheasant-eye of which no two are exactly alike, how many different combinations of Ajax and Pheasant-eye, taken two and two together, can be arranged? And as both Ajax and Pheasant-eye may be had in bloom simultaneously from the middle of March until the middle of May, roughly speaking, it is evident that we may obtain Nonpareils, or intermediate Daffodils, to flower during the whole of that period.

But when we have obtained this multiform progeny of short-crowned flowers, it is found that they in their turn will intermarry among themselves and with their parents, the trumpet Daffodils and the Pheasant-eyes, so that our computation becomes very intricate. But we can, to a large extent, mould the hybrid to our design, according to the elements we employ in the mixture. Thus, if we marry one of this short-crowned race

and a flower of a *poeticus* kind, we shall still further reduce the crown of the offspring; but the union of an "Incomparable" and an Ajax will give us a somewhat more extended crown in the seedling. If there is already a red edge or suffusion in the crown of our flower we may be able to intensify it by crossing it with a *poeticus*, which will add its own store of red or orange colouring matter. And here I may mention that my own experiments go to show that the varieties of *poeticus* or Pheasant-eye Narcissus which have a wholly red crown do not really contain more pigment than the commoner sorts, in which the colour is concentrated into a narrower and darker ring. By a careful selection of the most shapely, substantial, and robust forms to breed from, we can, with considerable accuracy, secure a fine progeny. Thus the round and well-shaped *N. poeticus ornatus* commonly tends to the production of good flowers, while those which have the larger, but more flimsy, *N. poeticus grandiflorus* for father or mother are usually wanting in solidity and symmetry.

It is strange that in modern times double Daffodils from seed have been considered as almost non-existent, or as great rarities. Those who have lately turned their attention in this direction have found that it is by no means difficult to raise double seedlings. Thus I have myself saved a good deal of seed from *Telamonius plenus*, the common double yellow of our gardens, and have flowered some quite double seedlings. From the scarce double *cernuus*, fertilised with pollen of an early single yellow Ajax, I have obtained an extraordinary family, consisting so far—for some of the plants have still to come into flower—of a large and very early creamy-white double, a yellow double, and a drooping yellow single. I have seedling plants which resulted from the application of pollen of *N. poeticus* to flowers of the common double yellow, and am awaiting their blooming with much curiosity. It was remarked by Herbert and the early raisers of cross-bred Narcissi that several varieties may be obtained from one and the same seed-pod. This consideration, taken in conjunction with the fact that, with very few exceptions indeed, every known or discoverable variety of Narcissus will breed with every other, demonstrates that the possible multiplication of varied form and colour in seedling Narcissi is infinite.

We may, as I have said, often ascertain the parentage of a

supposed hybrid plant by putting together the two supposed elements from which it was produced, and seeing whether we can ourselves thus produce the intermediate kind. This may be called, in scientific language, the synthetical method. There is another method, the method of analysis, or of breaking up a supposed cross-bred plant into its original elements, which may sometimes give us clear and useful information. For example, there are a certain number of creamy-white or sulphury-white Daffodils, such as those which you will find in Mr. Barr's collection under the labels F. W. Burbidge, Exquisite, and J. B. M. Camm, or those which my friend Mr. Wolley-Dod has sometimes shown as the "Bicester whites." Experts have thought that these must be crosses between *N. cernuus* or one of the pure white Daffodils and some yellow variety. Now, by sowing seed of these kinds I have raised, from the very same pod, both pure white and pure yellow flowers; in fact the seedlings have, as we say, reverted to the characters of their parents "on both sides of the house," and demonstrated their origin beyond doubt.

It is a curious fact, by the way, that when two such diverse elements as a trumpet Daffodil and a Pheasant-eye Narcissus marry and produce a "nonpareil," or short-crowned offspring, that offspring never more produces from its seed its parents, but only itself; while, on the other hand, the seedling from two closely akin Ajax varieties will give in its turn seedlings which reproduce both its parents.

Following a somewhat similar analytical method, I have sowed seed of the fine, well-formed, early Pheasant-eye, *N. poeticus ornatus*, and the result has been a great variety of flowers, precisely such as appears in a large wild Swiss, Italian, or Pyrenean bed of *N. poeticus*, among which I could find scarcely one so good in shape or substance as *ornatus*. The deduction I make from this experiment is this—that long ago some traveller or plant-collector observed in such a wild bed a singularly handsome flower, and dug up and took to his garden the bulb from which our whole stock of *ornatus* has descended. As to its early habit, the original plant may, as sometimes happens, have been more precocious than its fellows, or it may have been brought from some district where *N. poeticus* blooms early.

Thus both science and pleasure may find their satisfaction in

the work of raising seedling *Narcissi*. To those who have an eye chiefly to the pleasure, I must say that they will find the work tedious at first, while they are waiting the four, five, or six years which must elapse before their seedlings flower, but that the waiting will be forgotten when they have reached the happy stage of having a batch of plants coming into bloom every spring.

With regard to practical details of cultivation, &c., I find it best to keep the young plants in pans, pots, or boxes, plunged in ashes in a cold frame, for their first two years, and then to plant them out in slightly raised beds in open quarters. The *Corbularias*, *triandrus*, and such small and half-hardy sorts may be kept in their pans until they flower. I recommend careful fertilisation by hand, and the excision, in a young state, of the anthers of the mother-flower, for although some of the *Narcissi* may be "proterandrous," yet my own experience leads me to believe that the *poeticus* section and some others are rapidly self-fertilised. It is safer, too, that the mother-flower should be covered by glass or very fine muslin, for though bees and insects generally are not very fond of Daffodils, yet they haunt them to some extent, and a breeze bears the fine dry pollen a long way.

DISCUSSION.

Referring to the origin of the early-flowering *poeticus ornatus*, Mr. WOLLEY-DOD said he had no doubt that in fields full of any variety there would be as much as a month's difference in the time of the flowering of some of the forms. The common wild Daffodil in England was a case in point. It generally flowers in April, but some forms bloom earlier than this, and some later, and he said that he had taken the trouble to pick out the early-flowering kinds in his own collection, and plant them by themselves. He had no doubt that the same thing occurred in *N. poeticus*, and hence the origin of *p. ornatus*.

Mr. JOHN FRASER said that during the interesting remarks made by Mr. Engleheart he showed a white Daffodil which was supposed to have been raised from *N. moschatus*. In looking at the flower it would be observed that the tube was short, and that fact may be due to the doubling of the flower.

In regard to the raising of seedlings, Mr. Fraser said no doubt the subject was a very interesting one to specialists and enthusiasts, to the latter class of whom he was afraid he himself was

allied. But on looking at the many varieties exhibited in the conservatory, it was not, he said, likely that the people in the country would take them and retain their true names. It was therefore necessary that the Narcissus Committee should take this question of naming in hand, and he was glad that Mr. Engleheart was of the same opinion. In the raising of new seedlings Mr. Fraser urged that only the best kinds should be preserved. This system was carried out by market growers, who only grew those kinds which they found the public would buy, and he thought amateurs would do well to pursue a somewhat similar course.

NOTES ON NARCISSI, 1890.

By Rev. A. RAWSON, M.A., Windermere.

THE soil in my garden is a sandy loam, not the best for Narcissus; for though the common Pseudo-Narcissus grows wild in great abundance all round, and is, in fact, a weed in some of the meadows, a more holding soil seems to be required for most of the varieties. I may specially instance *maximus*, *spurius coronatus*, and similar sorts, which, though fine, do not grow well here. The climate, apart from the soil, is very suitable for Daffodils; indeed, if we had the soil, I am not sure we should not manage them as well as Mr. Hartland at Cork. We are about twelve miles from the sea, with the gulf-stream running up the coast, and the mean winter temperature is as high as that of Kent, where I lived for many years; added to which we have a rainfall averaging nearly 60 inches, in which the Narcissus delights. The great drawback is "want of sun"; we cannot get our bulbs so well ripened as in the south, and I have no doubt that to this we may attribute our want of success in the management of some varieties.

I have annexed two lists of the sorts I hold most in esteem—a first and a second list; for though perhaps some in No. 2 list ought to appear in No. 1, it is very difficult to make an exact distinction, and as many are comparatively new varieties, requiring further proof, I feel that, when grown for another year or two, many may crop up to make me alter my opinion. At present, in my estimation, for an all-round flower nothing beats *Horsfieldii*. For habit of growth, beauty, and productiveness it

is A 1, and, growing as it does here, is the admiration of everyone.

I am not sure that I should not put Sir Watkin next; and then I have two sent me by Mr. Barr, called Bastomil and Santa Maria, which are beautiful, and succeed admirably here. I have also put my own seedling, *Tridymus* "A. Rawson," in No. 1 list, not because I think my geese are all swans, but because of its good habit, striking flower, and fine foliage, all of which, added to its lateness, make it a very desirable variety.

The *cernuus* section do not do well here. They have a troublesome way of disappearing, but they are very beautiful. Colleen Bawn and Minnie Warren are in high favour. I have one also, a variety of *pallidus præcox*, called Asturicus, which is very fine.

With regard to the small sections, *triandrus*, *Corbularia*, &c., I find they must have protection here, to grow them in perfection, or the frost injures the bloom. It is the same with the Algerian varieties, *serotinus*, *elegans*, *viridiflorus*, &c., which should certainly be under cover in summer as well as in winter, on account of the too great abundance of rain. They succeed very well with pot culture. I believe the secret in growing them is not to over-pot them; leave them alone in the pots for two or three years, and finish them off, if possible, in a cool greenhouse, where no frost can reach them. When the foliage dies down I place the pots (not plunged) under a handlight, in the hottest place in the garden I can find; there they remain till September, when I remove the top soil down to the bulbs, plunge them overhead in a water-tank for an hour, put them to drain for a day, then top-dress with rich compost, plunge overhead in cocoa-nut fibre refuse in a cold frame, and think nothing more of them till they show signs of growth in February. After that they require the ordinary attention of plants in pots, and just before the bloom comes on I take the pots into the greenhouse, place them in pans with half an inch of water at the bottom, and now and then give them a pinch of any of the artificial soluble manures; and this method of treatment I find suits them to perfection. There are, however, two varieties which as yet beat me—*N. dubius* (the true sort) and *C. monophylla*. I used to grow the last one well, and, indeed, was the first to exhibit it, some years ago, in any perfection; but my hand "has lost its cunning." The true *N. dubius* is a charming little flower, but

quite distinct from what is advertised as such in bulb catalogues. I can grow it admirably, but it refuses to bloom. I have persuaded it to do so only once or twice, but I hope to succeed with it yet. *Narcissus cyclamineus* is another that seems to require different treatment from the *triandrus* section, but as Mr. Barr says it grows in a swamp, it will doubtless be managed soon.

With regard to deep or shallow planting, there seems to be a great diversity of opinion among the best growers. I have hardly made up my mind about it, but I am inclined to think that where there is little sun and much rain, as is the case here, shallow planting is the best. As to the annual moving of the bulbs, there seems to be the same difference of opinion; my own idea is that they are better left in the ground for two years at least, helping them, during the growth of the leaves, with a little artificial manure sprinkled among the rows.

LIST No. 1.

Magni-coronati:

Ard Righ.
Asturicus.
Bastomil.
Cernuus.
Colleen Bawn.
Countess of Annesley.
Empress.
Horsfieldii.
Mrs. George Cammell.
Pseudo-bicolor.
Santa Maria.

Medii-coronati:

Barrii conspicuus.
C. J. Backhouse.
Duchess of Westminster.
Gwyther.
Princess Mary.
Queen Sophia.
Sir Watkin.
Tridymus, A. Rawson.

Parvi-coronati:

Little Dirk.
Poeticus grandiflorus.
P. patellaris.
Princess Louise.

Double:

Hale's Silver and Gold.
Coddings and Cream.
Queen Anne's Double Jonquil.

As to the *small* varieties, *all* are gems, particularly:

Cyclamineus.
Dubius, *true*.
Rupicola.

LIST No. 2.

Magni-coronati:

Emperor.
Grandis.
Dr. Hogg.
Lady Grosvenor.
Mrs. J. B. M. Camm.
Maximus.
Oporto Yellow.
Wm. Goldring.

Medii-coronati:

Grand Duchess.
Madge Matthew.
M. M. de Graaff.
Mrs. Langtry.
Mrs. C. J. Backhouse.
Sensation.

Parvi-coronati:

Poeticus grandiflorus.

For gathering for cut flowers the following are highly appreciated, apart from the lists:

Cynosure.
Figaro.
Glow.
Jonquil, double.
Leedsii.
Poeticus ornatus.
Princeps.
Rugilobus.
Tenby.
Bicolor.
Moschatus.

THURSDAY, APRIL 17.

ON the second day of the Conference the chair was taken at 2 P.M. by J. G. Baker, Esq., F.R.S., who opened the meeting as follows :—

In dealing with Daffodils I must necessarily look at them from the botanist's point of view. The genus *Narcissus* has now got out of the hands of the botanist, and gone into the hands of the hybridist, who has raised numerous forms by crossing one kind with another. With these various forms the botanist has little to do, except in so far as he can trace every production of the hybridist to its parents. We botanists can only go to a certain point in dealing with garden plants of all kinds, and after that the gardeners take them up and knock us out of time entirely, and can tell us more than we know about their variations and life history.

When I look back twenty years (for it was in the year 1869 I wrote a review of the genus *Narcissus* in the *Gardeners' Chronicle*), I am surprised and gratified at the progress which has been made. At that time very few people took any interest in Daffodils, but a complete revolution has taken place, and the Daffodil now shares with the Primrose the honour of being the most popular flower of the spring-time.

The genus is of great interest from a botanical point of view. We are obliged as botanists to deal with all plants on one uniform plan as regards arrangement and nomenclature. From that point of view we look upon *Narcissus pseudo-narcissus* as a single aggregate species, and, comprised within this, there are in gardens about 200 forms. In the whole genus we have only about twelve or sixteen distinct species in this sense. The greatest change at the present time is the raising of forms from species or varieties not known to hybridise before, and it is wonderful that all the *Narcissi* cross so freely, many of them—as, for instance, *N. pseudo-narcissus* and *N. poeticus*—being so distinct from each other in form. The consequence is that we have that enormous range of variation in form which is so well represented here before us to-day.

I will not take up your time any longer, but call on Mr. Wolley-Dod to read his paper to you, which will doubtless be of

great interest. He has been working at Daffodils for a long course of years, and will be able to tell us much that we do not at present know.

THE NATURAL HISTORY AND CULTIVATION OF THE TRUMPET DAFFODIL.

By the Rev. C. WOLLEY-DOD, M.A.

N. CORBULARIA stands first on the list of trumpet Daffodils. Only one variety of this is quite hardy in my garden in Cheshire, var. *citrina*. I do not mean to say that the others are killed by frost in winter, but the meteorological conditions and mean soil temperature do not suit them. *Citrina* is the only one found in Europe outside the Spanish Peninsula, and that does not extend far outside. A line drawn from Bordeaux to Bagnères de Bigorre in the Pyrenees will define its extra limits, and it seems to extend all through the northern provinces of Spain. The size of the flower varies from that of the smallest to the largest of the *corbulariæ*. This, and all others that I have grown, ripen seed in cultivation abundantly, which is easily raised, flowering the fourth year. I only further remark that the white *corbularia* described by Clusius has been wrongly referred to the Algerian variety *monophylla*, which was never found in Europe; it was var. *Graellsii*, which is marked by its green perianth. Coming to the species *N. pseudo-narcissus*, which in Mr. Baker's arrangement includes all the other kinds of trumpet Daffodil, its natural distribution has been so greatly modified by the hand of man that it is difficult to define its limits. Even where we find it naturalised, we cannot always tell whether it was introduced there as a wild variety, or one raised in cultivation. Let us take an example: Ireland is a country where the soil and climate are especially well suited for the growth of the Daffodil, and in Ireland we find some very fine varieties apparently wild. But Bentham, one of our best authorities on the distribution of plants, says that Ireland is outside the range of *N. pseudo-narcissus*. Where did these Daffodils come from, and when? Italy seems the most likely source. Ard Righ, a large self yellow variety, seems like a development of large Italian forms; another, called *princeps*,

can be nearly matched wild in Italy; a very large Daffodil lately brought into notice from Castle Welland Park, County Down, and named Countess of Annesley, is very like an enlargement of an Italian variety which I have. They may have been introduced by the monks in the middle ages, who were the herbalists of those times. We know how introduced plants are found about the sites of old abbeys, and these religious houses were generally branches from Italian head-quarters. Gerard and Parkinson tell us of the medicinal virtues of the Daffodil, and the monks of the fifteenth and sixteenth centuries, finding no Daffodils in Ireland, would naturally bring or send for so easily transported a plant from their head establishment. Something of this kind may account for the prevalence of these fine forms in Ireland.

Western Europe generally, from the Atlantic to the longitude of the Adriatic, is the native home of the Daffodil. I cannot trace it south of Madrid in the Spanish Peninsula, or south of Rome in Italy; it may probably be found in Dalmatia, but I have been unable to obtain it from further east; it is said to be a truly wild plant in Hungary and Transylvania, though not in any part of Turkey or Greece. The cradle and the metropolis of the species, as far as we can judge, would seem to be the Pyrenees.

The number of wild forms of Daffodil which are distinct in size, form, colour, and habit is very large, and every year is adding to our knowledge of them. Little has yet been done to classify them, or to distinguish between these and varieties of cultivation. The laborious investigators at the beginning of this century, such as Haworth and Herbert, worked to a great extent in the dark, describing the forms they found in cultivation, but often knowing nothing of their history. It is much to be desired that some enterprising young botanist would make this his special study, doing for the *Narcissus* what Mr. George Maw has done for the *Crocus*, visiting the varieties in their own home, and collecting and recording all existing wild forms. The trumpet Daffodil alone would require perhaps two hundred or three hundred specimens to illustrate fully all its wild varieties, but before all the specific distinctions of *Narcissus* are quite lost by hybridising in cultivation, giving rise to endless confusion, something of this sort ought to be done.

We cannot classify Daffodils by their countries; such an arrangement might have been possible if none had ever been transplanted, but it would be useless to attempt it now. To classify by size would be quite as misleading. Haworth and Herbert recognise that colour is a very important character in this species, and though a division by colour may be open to objections, still it is convenient to make some division into sections, and I can suggest no better character. The division refers to wild Daffodils only; in the varieties and crosses of cultivation, distinctions of colour, like all other distinctions, become effaced, but for convenience I hope to speak of wild Daffodils under five sections: 1. *Discolor*. 2. *Concolor*. 3. *Pallidus*. 4. *Albus*. 5. *Muticus*. The last name does not refer to colour, and I shall presently explain the exception.

No. 1, *discolor*, includes all, except *muticus*, in which the perianth and the crown are contrasted in colour. I have avoided the name *bicolor* as ambiguous. No one knows what Linnæus intended by *N. bicolor*. In the old herbaria at Kew I find the name *bicolor* assigned to forms with narrow leaves, quite different from the so-called *bicolor* of Haworth, and we find the pure white perianth in many other forms. We do not know the history of "*bicolor* of Haworth," but, whether it has a wild origin or not, it certainly belongs to and is a development of section 5, *muticus*. Section *discolor* is placed first because it includes the English wild Daffodil, generally accepted as the type of the species. The section is represented in all countries where the species is found wild, but is least common in the Spanish Peninsula, and reaches its largest wild development in Italy.

No. 2, *concolor*, includes all yellow Daffodils in which the difference of colour between the perianth and crown is slight. Besides the old types *major* and *minor*, we have *spurius* of Haworth, probably Italian, also the "Oporto" Daffodil, a varied form prevalent in Northern Portugal, and many others. The section is common in Northern Italy, and the northern parts of the Spanish Peninsula, but scarce in France and the Pyrenees. There is a small Daffodil found near Grasse in the Maritime Alps in which concolorous and discolorous flowers are indiscriminately mixed together. This is the only instance I know where that habit occurs in a truly wild form.

No. 3, *pallidus*, is distinct in form and characters. It is very abundant round Bayonne. It extends, as that enterprising investigator Mr. Barr found, along Northern Spain into Galicia. I have elegant and distinct forms said to come from the Eastern Pyrenees, but I have not ascertained its exact eastern limits. I have never received it from Italy; those offered in Italian catalogues under the name are light-coloured forms of section 1.

No. 4, *albus*.—We know but little of this as a wild plant. Only one habitat and one wild variety have been recognised in recent times, though several others are indicated by Parkinson and other old writers. It was re-discovered about 1884, and has since been imported abundantly from the Spanish frontier of the Central Pyrenees, a few miles south of Gavarnie, where it is said to have been nearly exterminated to supply the English market. Other forms reputed to be wild somewhere have been known in cultivation for more than three centuries. The section will probably be found to have a more extended range. Mr. Barr failed to find it in Galicia, though recorded as a habitat by more than one local botanist.

No. 5, *muticus*.—This section is the most important of all from a florist's point of view, because from this base are certainly derived those grand forms Emperor, Empress, Horsfieldii, and the rest of that class. The name is adopted from the French botanist Gay, and means nearly the same as *abscissus*, referring to the "clipt" appearance of the crown. The variety is so distinct that Haworth made of it a separate genus, which he called *Oileus*. He described six species of it, only one of which he called *abscissus*, in which the crown seems cut clean off at the mouth. He tells us that he had never seen any one of the six, but *muticus* is so variable in form and size that if Haworth had had our knowledge of it he could more likely have divided it into a dozen than into six. Some of the forms are large, rivaling *rugilobus* in size, and are nearly uniform sulphur-coloured, while others have a pure white perianth nearly approaching *bicolor* of Haworth. The characters are: very thick upright dark-green leaves, with rounded tops, long cylindrical crown, often of small diameter, the mouth straight cut or slightly expanded, without prominent lobes. It is by far the latest to flower of all the wild trumpet forms. I had thought it limited to the Pyrenees, but Professor Foster tells me that he found a Daffodil near the

Lago Maggiore resembling *rugilobus*, which is probably a development of this variety. The largest I have seen came from the neighbourhood of Bagnères de Bigorre, and of Luchon, where it has a range reaching to 6,000 or 7,000 feet, being the highest Daffodil except perhaps section 4. Importations to England come mostly from the valley of Gavarnie, where its size is smaller. In some parts of the Pyrenees it seems to mix with the local *discolor* forms, which then cease to be uniform in character, giving rise to the mixtures known as *variformis*, which afford ground for a separate study themselves. In other places forms of *pallidus* seem to take part in the crosses. Such a mixture as this is very rare in nature. We find in general that in each wild habitat uniformity is the rule; and we should infer that the species had adapted itself in habit and colour in the course of long ages to the surrounding circumstances of soil and climate. Still we are met by paradoxes, for if we try to recognise what was the original type, we might suggest the high mountain form *muticus*, with its robust habit and simple crown; but side by side within a few miles at the same elevation we find the delicate and slender Daffodil known as *moschatus*. But *moschatus* grows in peat soil and *muticus* in loamy soil, and perhaps this alone may account for the difference.

But though uniformity of flower and habit is the rule in each wild habitat and in each artificial habitat where only one variety has been planted, the case is quite different, as I have already told, where two or more varieties have met or have been planted together. During a long and fruitless search for an *albino* wild English Daffodil—an accidental seedling with a white flower, such as we often find in *Scilla nutans*, *Campanula rotundifolia*, and of yellow flowers in *Verbascum nigrum*—I heard of two places widely apart where common wild Daffodils grew mixed with white-flowered forms. Every shade of intermediate colour and form was to be found amongst them, but a careful investigation satisfied me that they owed their origin to the white variety of *pseudo-narcissus* having been planted amongst the typical wild form. These had crossed and seeded, and some of the seedlings had exactly the form of the typical wild variety, but the colour was pure white.

The results of raising seedlings where a variety of trumpet Daffodils are grown together are now so well known that I need

not enlarge further on this subject, except to say that wherever we find apparently wild Daffodils of very mixed characters it may be fairly concluded that they owe their origin to a cross between two or more varieties.

Before speaking of the wild hybrids of *N. pseudo-narcissus*, I must define hybrid as a cross between two plants recognised as distinct species; a cross between two varieties of the same species is not rightly called a hybrid. Hybrids may be divided into non-persistent and persistent, also into barren and fertile. How many hybrids may have been produced in past time, to perish again when their life as individuals was ended, we cannot tell. It is only when a hybrid comes with such a constitution and under such conditions as to be persistent and perpetual that botanists think it worth while to adopt it as a species. The first hybrid I shall mention is non-persistent, namely, *N. juncifolius* × *N. pseudo-narcissus* var. *muticus*. This occurs sparingly and in single specimens amongst its parents in high mountain pastures near Gavarnie. It is hardly too much to assume, when we thus find that one of the largest of the genus forms a hybrid with nearly the smallest—two species very distinct in form and habit—that any species of *Narcissus* may, under favourable conditions, be crossed with any other. This hybrid was discovered in May 1884, and since that date a local collector has supplied me annually with a few bulbs. The form of the crown varies sufficiently in different individuals to prove their independent origin. It is not robust in cultivation, having a tendency to break up into small bulbs, which easily perish, and it never bears a seed. It is not unlike a small form of *N. odorus*. Perhaps *N. odorus* may be due to some similar cross in remote antiquity; some botanists have thought its parents to be *N. jonquilla* × *N. pseudo-narcissus*; but if a hybrid, it is certainly a persistent hybrid, though it never bears a seed. Its native home is uncertain; it is not known that *N. jonquilla* is now found wild anywhere in company with *N. pseudo-narcissus*. Another hybrid which has established itself persistently and independently in several places is *N. pseudo-narcissus* × *N. triandrus*. Mr. Tait sent me several bulbs of this in 1885, which he found scattered singly amongst the parents. Two years later it was found growing in quantity near Oporto, and was named *N. Johnstoni*, and I believe that Mr. Barr found some variety of it in North-

western Spain. The characters of the flower as well as of the leaf—the long funnel-shaped tube—and especially the biserial attachment of the filaments, do not belong to *N. pseudo-narcissus*. No seed has ever been found on it, either wild or in cultivation.

The most important hybrid of the trumpet Daffodil, as the exhibition at this Conference testifies, is that with *N. poeticus*. *N. incomparabilis*, which has always been accepted as a species, is thought by many to owe its origin in some remote time to this cross; we can neither affirm nor deny that it is so—it may be an independent development of the genus *Narcissus*. Anyhow it is a plant of great vigour of constitution, and can be closely imitated by crossing the two species mentioned. Its native home is probably amongst the Italian lakes, though it is established apparently wild in France, and perhaps in Northern Spain and Portugal. But there is no doubt that wherever *N. pseudo-narcissus* and *N. poeticus* flower in the same spot simultaneously hybrids are produced similar in form to *incomparabilis*, but in great variety. These seem to be of good constitution, and include nearly all the forms, though of smaller size, which have been raised in cultivation from the same cross. They produce fertile seed in abundance, which comes up readily; why they have not established themselves more widely and travelled from their birthplace I cannot explain.

One more wild trumpet Daffodil should be mentioned, though I have no reason to think it a hybrid—I mean *N. cyclamineus* of Northern Portugal. Its history is too well known to repeat. It bears seed in abundance; some of the seedlings sown in 1886 flowered this spring. It prefers peat to loam, comes into flower very early, and is not of robust constitution in cultivation. The remarkably short tube, less than one-tenth the length of the crown, the reflexed perianth, and the large flat disc of the triple stigma seem to mark it as a distinct species.

It is not intended in these notes to enter into the details of the hybrids and developments of *N. pseudo-narcissus* which have had their origin in cultivation. The power of the trumpet Daffodil to produce a series of endless variety by crossing with *N. poeticus* was first shown in nature by wild hybrids, as already mentioned; and abundant use has been made of this power to raise a beautiful series of varieties, as exhibited to-day. But there are many other hybrids, old and recent, which bridge

over the line of distinction between *N. pseudo-narcissus* and *N. incomparabilis*, and again between *N. incomparabilis* and *N. poeticus*. The sections called *Humei*, *Backhousei*, *Sabini*, *Nelsoni*, *Burbidgei*—I may add *tridymus* and others—make an unbroken series from the largest crown to the smallest, and hybrid has been crossed with hybrid, and species with species, till we are at a loss in cultivated forms where to find the limit of the *pseudo-narcissus*. But when we come to look over the varieties which have arisen from crosses of different sections of the trumpet Daffodil, we get quite bewildered by their multitude. Indeed, in every garden where many kinds are grown, and are allowed to ripen and shed their seed, and the seedlings are left to mature by four or five years' growth, change upon change, and novelty after novelty, may be reasonably expected and are very often found. But there is a great difference in climates and soils; some are far more favourable for the development of fine varieties than others.

In these suitable soils seedlings show advances, whilst in others they seem to deteriorate from their parents. Some of the finest garden varieties are said to have been raised by accident, without any artificial crossing. Therefore all who grow good Daffodils may hope some day to find a better, unexpectedly, especially if they go about on sunny days with a camel-hair pencil transferring pollen to stigma amongst the best varieties, and tying a bit of scarlet wool round the stalk of the flowers dressed, to save them from being cut for the drawing-room.

It may be mentioned, as a mark of the appreciation in which fine novelties in this class are now held, that when Emperor and Empress were first offered to the public, about fifteen years ago, their price was two shillings and sixpence each; but last year Madame de Graaff and Glory of Leyden were brought out at a price forty times larger.

We now come to double Daffodils—an important part of the natural history of the species, for *N. pseudo-narcissus* is one of the few British plants which produce double flowers in a perfectly wild state. I shall speak chiefly of two forms—(1) the double typical wild English Daffodil, which occurs wild in Devonshire, in Hampshire, in South Wales, and several other parts of the country; (2) the large garden double, commonly called *Telamonius plenus*. I was brought up in the popular

belief that to obtain this last flower you had only to dig up the small single wild flower and to plant it in good soil in a garden. This matter has often been discussed in gardening journals. Witnesses are never wanting who positively assert that they have effected this transformation in their own gardens, and I have received many private letters, both from amateurs and from professed gardeners, giving detailed accounts of their experience in producing this change. The doubling is alleged to take place not in one or two flowers out of many, but wholesale, and generally in the second or third year after transplanting, and when once this advance has taken place the flowers will not revert to their former small single condition. I am perfectly satisfied of the good faith of several of my informants, but not equally sure of the accuracy and continuity of their observation. Still, I preserve an open mind on the subject. It is about fifteen years since my attention was first directed to it. During that time I have done all in my power, by high and low cultivation, to raise a large double Daffodil out of small single-flowered bulbs, but in vain. Not only this, but I have asked my correspondents in these cases to supply me with some of the wild Daffodils before transformation, and some of them when transformed into doubles. The singles sent me have in all cases continued single and small, and the doubles, double and large. Also six years ago I distributed to about forty gardens, including all where this doubling was alleged to have taken place, a number of bulbs of wild single *pseudo-narcissus*, giving careful instructions for isolating and observing them; whenever I have heard the result up to this time, the bulbs have either died out or still retained their small single form. It may be added that the large double Daffodil of gardens is a most prolific and persistent bulb, with a very strong constitution. It often comes from the south of France, mixed with *pallidus præcox*, and I have watched the way in which it gradually overwhelms the weaker bulbs in a clump and supersedes them, giving rise to the belief, which I have more than once heard, that *pallidus præcox* also becomes transformed. This so-called double *Telamonius*, however, is in more than one way a remarkable bulb. It can be raised from seed, not only of itself, which it ripens under favourable conditions, but from the seed of other varieties. It grows in Pembrokeshire amongst the Tenby Daffodil, and I have raised it more than once from the

seed of Tenby gathered in my garden. It abounds in Italy in the valley of the Arno, mixed with a large single Italian variety, into which it passes by every degree from full double. It is also found in the south of France, growing with the concolorous *major*, where perhaps both may be of cultivated origin. Lately, Captain Dorrien-Smith sent me from Scilly a twin bulb of the Tenby Daffodil, both divisions being included in one tunic, one-half bearing a typical Tenby single flower, the other a large double *Telamonius*. Mr. Engleheart sent me a few years ago from Hampshire a large number of seedlings from the large garden double and the wild single grown together, no other Daffodil being near. These produced a remarkable variety of single and double forms in a series of varying size, and the doubles retain their relative size after several years' cultivation. I infer that a double Daffodil, though occasionally a sport, is often, as it were, a new departure springing from seed, and that it does not of necessity follow the form of the seed parent; also that there is a tendency in the double seedlings of large Daffodils to assimilate to one type. Doubles are not always represented by corresponding singles, and there are probably far more varieties of doubles in existence than is generally supposed. Dr. Stuart, of Hillside, in Berwickshire, lately sent me several very distinct forms of small double Daffodil which he found naturalised in a field where two or three single dwarf kinds were growing.

Of the five sections into which I divided *N. pseudo-narcissus*, Nos. 1, 2, and 4 have produced doubles. I have never seen a double of *pallidus* or *muticus*, or of any of this class.

One more point may be noticed about doubles: we see forms in which the crown only is double, its outline being preserved unbroken, and forms in which the doubling is full like a double Rose. Some kinds seem to assume one form rather than the other. The wild *pseudo-narcissus* of Britain and the double said to be of *cernuus* generally take the semi-double shape; but there is no essential difference, and all pass from one form to the other according to soil, season, and cultivation. With me the semi-double forms certainly represent a more healthy and more robust condition of growth in all Daffodils; when they break the trumpet and become full double, they are often beginning to deteriorate, but this season nearly all my double wild bulbs and double *cernuus* have produced rose-double

flowers; next year, if they survive and are transplanted, they will probably most of them be semi-double again.

Daffodils have different constitutions; those have a good constitution which readily adapt themselves to various conditions of climate and soil, and thrive in spite of such changes. As I have remarked by the examples of *muticus* and *moschatus*, constitution does not depend upon habitat. Varieties of undeniably good constitution are the large garden double, and the single and double type of *incomparabilis*, and of newer kinds, *Horsfieldii* and *Sir Watkin*. Daffodils have not a good constitution when the English climate does not agree with them. *Ard Righ* and *princeps* seem robust enough in Ireland, but degenerate and die out in many English gardens. Rapidity of increase is quite compatible with a bad constitution, and nothing helps infirm Daffodils so much as frequent transplanting. It does for them what change of air does for mankind. On the subject of cultivation, I shall make only a few casual remarks. No question is more frequently asked than "How often ought Daffodils to be lifted?" This depends on many circumstances, chiefly on the kinds and on the soil. Some kinds in some soils may be left for many years without suffering any deterioration in flowering qualities; but when flowers become fewer, in proportion to the mass of leaves, transplanting is desirable. They should be dug up before the leaves have quite disappeared, and planted again, from four to eight inches deep, according to size, in August or September; the soil should be well worked, but the bulbs should not be planted in it whilst loose, as they do much better when it is firm and compact, though it must never be pressed together when wet. When out of the ground they should be kept airy, dry, and warm. Many kinds of *Narcissus*, especially the white trumpets, seem to do better in the mixed borders of a shrubbery, where there is some competition with other roots for the nourishment in the soil, than in beds especially prepared for and exclusively devoted to them. In such beds the soil is often too good, and the bulbs increase too quickly—a frequent source of disease. When this happens they must be frequently moved. I never could succeed in keeping in good health *maximus*, *Ard Righ*, double *cernuus*, and some others until I made it a rule never to leave them unmoved for more than two years. The same soil will not suit all. *N. poeticus* likes a strong soil, so the hybrids of this species do

well in a more retentive soil than suits most trumpets. *Maximus*, *pallidus*, and *minor* prefer a light soil, and heavy beds must be mixed with rock gravel for them, or some similar material. Leaf-mould favours leaf growth rather than flower, and should be added sparingly. All the whites do well in peat, or soil of that character. They increase less quickly in it, but continue healthy. The stronger and taller varieties of all kinds should have a sheltered but not shaded situation; even there violent gales break not only scapes but leaves. I filled several vases with flowers broken clean off at the ground-line by the gale of last Easter Monday. The only remedy is tying up, to which I am obliged to resort in more exposed places. Daffodils like to see the sun. They flower as well in the shade their first season, but need sunlight for the leaves whilst forming the embryo flower for the following year. A favourite spot for them is the angle at the base of a steep bank or rockery, where it joins the level. This preference is most marked, and they keep their flowering qualities longer in such places without being moved. They always do well planted against large half-buried stones, either on a rockery or at the edge of raised beds. When planted in grass they seem never to suffer from disease, and continue for many years without much increase; but the kinds selected for this must be those for which the natural soil is suited, and the grass must not be mown until the leaves are dead, not earlier than the end of June. Bulbs casually collected by tourists or guides are generally dug up and dried off when in flower; this may be known by the large quantity of loose husk which surrounds them. Such bulbs will not flower the next season, but start into growth directly they are replanted; therefore, in order that the leaves may not become too long before winter, they should be kept out of the ground late, say until October. Those lifted a little before the leaves are ripe flower earlier than others, but the flowers are less fine. Bulbs transferred from a warmer to a colder climate flower earlier the first season than those which have been longer in cultivation in the colder climate.

No kind of animal pest ever injures my Daffodils underground—the Narcissus fly (*Merodon*) is unknown in my garden—but the bulbs are very subject to a kind of rot, for which I have long sought the cause and the remedy. The mischief is done the season before it appears. The leaves come up at the end of

winter, but about the time the flower-bud shows, the growth is suddenly arrested. The leaves become brown at the ends, and if the bulb is examined it is found rootless and dropsical. The tunic at its base is soft and rotten; the spaces between the coats of the bulb seem to be filled with water, and it generally dies slowly, for want of power to complete a fresh growth. This disease is encouraged by cold wet seasons, and is commonest on wet heavy soils, and amongst bulbs which have increased rapidly without being transplanted, and are found in a lump massed closely round a small central base. If transplanted at once into very dry soil, as soon as the mischief appears, some of them recover, but do not flower again for at least two years. The *incomparabilis* section is not liable to be attacked; the white-flowered trumpets suffer most; then come Ard Righ, and several others of the *concolor* section. Those of the *muticus* class are nearly exempt. In the spring of 1889 nearly one-third of my trumpet Daffodils perished in this way. This I attributed to two causes: first, that transplanting had been neglected too long, owing to absence from home; and, secondly, that the ripening season of 1888 was exceptionally wet and cold. Another but less extensive cause of loss is a habit in the young growth of rotting off during the end of winter. It is worst when the season is too forward, and hard frost succeeds wet. The leaves rot through at the base where they join the bulb, and no fresh start can be made.

A parasitic fungus, called *Puccinia Schraeteri*, has for two or three years infested my *triandrus*, which were imported from Portugal. I have not yet determined to what extent it is destructive to the bulb. Last year I observed it on the leaves of a clump of the large double yellow Daffodil, which I carefully marked. The disease has reappeared there this year, and the leaves attacked seemed less vigorous than the others.

About the end of March in the present year many of my Daffodil flowers suddenly became spotty. An expert who has examined them thinks the attack very like the Lily spot, which in the spring of 1889 was very prevalent amongst young Lilies and Tulips in the same bed.

ON POLYANTHUS NARCISSI.

By J. H. KRELAGE.

A STUDY of the horticultural treatises of the last century reveals to us the various flowers which have from time to time reigned as first favourites in cultivation, and among these bulbous plants are always placed in the first rank. Thus James Maddock, in his "Florists' Directory" (1792), places the flowers as follows: Hyacinths, Tulips, Ranunculuses, Anemones, Auricula, Carnations, Pinks; while in the "Traité" of the Dutch florists Nicolas van Kampen & Son (1760) it is said: "After Hyacinths, Tulips, Ranunculuses, and Anemones, the next flower which merits our attention is the *Polyanthus Narcissus*." So that already more than a hundred years ago these flowers occupied a very prominent position in Continental gardens, though less attention seems to have been paid to them in England. At least Philip Miller, in his "Gardening Dictionary" (1735),* mentions that the florists of Holland, Flanders, and France had taken great pains in cultivating and improving them, while he does not say anything about English gardening in this matter. "The reason of this," says James Justice in his "British Gardener's Director" (Edinburgh, 1764), "is that the raising *Narcissi* from seeds is so prolix that it is not worth the trouble, pains, and necessary attendance and expense of a nurseryman." It is well known that by far the greater number of the varieties of *Polyanthus Narcissus* were raised in Holland, and so it seems that the Dutch had in this matter more patience, skill, and perspicuity. And so it comes to pass that the *Polyanthus Narcissus* was from the first, and is still, rightly considered to be a Dutch plant; and it is this circumstance, I suppose, which led the Council of the Royal Horticultural Society to invite a Dutch florist to treat of this subject. And although there are some specialists among my countrymen to whom this task would have been more familiar, I will nevertheless try to say something about this favourite *Narcissus* of Holland. My communication, however, must necessarily be somewhat superficial, for even if I had the leisure (which I have not) to make a profound study of this group of

* 7th edition of 1760.

the Narcissi, it would take up far too much of the time and patience of my hearers.

The Polyanthus Narcissus is the *Narcissus Tazetta* of Linnaeus, belonging to the genus *Hermione* of Haworth, of which Mr. J. G. Baker ("Amaryllideæ," 1888) enumerates fourteen sub-species, divided into groups, according to the colours of the flowers, viz.: (a) perianth white, corona yellow; (b) perianth and corona both white; (c) perianth and corona both yellow.

This is not the place to give botanical details about the different forms which are found wild in Portugal and in the islands of the Archipelago, where Miller states that they were growing in his time, or in the much wider zone now considered to be their native habitat, viz., from the Canary Islands to Portugal, and on through the South of Europe to Syria, Cashmere, China, and Japan. The home of the largest number of the various forms appears to be in Italy and the South-east of France. Before, however, I proceed to speak of the forms most generally cultivated, a few notes about the introduction of this flower into gardens may perhaps be welcome.

The first Polyanthus Narcissus which was introduced into cultivation dates from 1561. It was sent by Matthias de l'Obel to the Netherlands from Languedoc, and is first figured in L'Obel's Herbal of 1581 as the second *Narcissus medio-luteus*, named "Donas," and is described as growing in Provence as a weed in the grass. It has a white perianth with yellow cup, bearing six, ten, or twelve flowers on a stalk; Clusius, who gives the name *præcox* to this variety, observed it once, by exception, with sixteen flowers on a stalk.

About this same time, in the Herbals of L'Obel (1581), Dalechamps (1586), and Gerarde (1597), we find described and figured, under various names, (1) the above-mentioned variety, considered to be the first introduced N. Tazetta Lois; (2) N. polyanthus Lois, "the milk-white Daffodil," or *totus albus*; and (3) "the double white Daffodil of Constantinople," our double Roman variety. In the different editions of Emanuel Sweert's "Florilegium" (1612 and later) figures are found of eight different forms of Polyanthus Narcissus, and in the splendid "Hortus Eystettensis" of the same year (1612) twelve different Polyanthus Narcissi are finely reproduced. Caspar Bauhin, in his "Pinax" (1623), gives a

classification of the *N. Tazetta*, after the same system as that which is adopted nowadays, viz.: (a) *totus albus*; (b) *medioluteus*; (c) *totus luteus*. He enumerates eight forms of the first class, thirteen of the second, and five of the third; numbers of synonyms of most of these varieties being given with much more exactitude than heretofore. In Parkinson's well-known "Paradisus" (1629) we find described and figured a certain number of *Polyanthus Narcissi*; but, after comparing his notes with those of Continental writers, we infer that at that time many more forms were cultivated on the Continent, especially in the Netherlands, than in England. It is quite certain, too, from the remarks of Petrus Lauremberg (1632), and from the different editions of the catalogue of the Botanic Gardens at Leiden, that already numerous Dutch seedlings were in cultivation.

Heinrich Hesse ("Deutscher Gärtner," 1710) tells us that at the beginning of the eighteenth century the *Polyanthus Narcissi* introduced from the Mediterranean into Holland were cultivated in cape pits, though some varieties were treated in the same way as at present—planted in autumn in the open ground, with a thick cover of dry leaves or moss laid over them in the winter. The well-known variety, *orientalis* (Muzart), was already an object of cultivation. You see then that *Polyanthus Narcissus* was always a subject of careful cultivation by the Dutch florists; and in the second part of the eighteenth century numerous named collections were found in Holland, unrivalled elsewhere, from which the amateur gardens of the whole world were regularly supplied.

As for cultivation, very simple hints are given by Van Kampen in his above-mentioned "Traité" of 1760. "Their culture," says he, "presents no difficulty; they only want careful protection against frost. They should be planted in November, 8 inches deep, otherwise the new shoots will be damaged by the frost in spring. The soil should be well worked, but not much mixed with dung, as they do not like a greasy soil. Amateurs living in more northern climates should plant the bulbs somewhat earlier, covering them with straw or old tan to protect them against frost. The time for taking up the bulbs is the end of July." The method of cultivation in Holland at present is very much the same as it was a century ago. The bulbs for sale the next year are, however, planted earlier—in

September, sometimes in August, soon after having been taken up and cleaned. In Van Kampen's times the bulb trade merely consisted in selling to amateurs, and the wants of the trade were very different from what they are now. At present the trade requires finely formed and strongly grown bulbs, in order to have a good article for dry sale; whereas formerly the desire only was to have bulbs which could give fine flowers. And this difference in the aim of cultivators has occasioned certain alterations in the way of treatment. The early planting and thick covering with leaves during winter keeps the roots active and the plant always growing, and though the part of the leaves grown under the mulching remains colourless and yellow, not always changing into green, it does not appear to injure the bulbs. The system of taking up the bulbs of Polyanthus Narcissi every year, and giving them a fresh soil the following season, was in practice more than a hundred years ago, as is stated by James Justice, and it is the only possible system by which to grow fine bulbs.

In the last century Polyanthus Narcissus were classified as follows:—

- | | | | | |
|-----|----------------------------------|---------|--------|----------|
| (a) | Perianth | white, | Corona | white. |
| (b) | „ | „ | „ | yellow. |
| (c) | „ | „ | „ | sulphur. |
| (d) | „ | „ | „ | orange. |
| (e) | „ | yellow, | „ | yellow. |
| (f) | „ | „ | „ | sulphur. |
| (g) | „ | „ | „ | orange. |
| (h) | Double varieties of all classes. | | | |

The most famous growers of these flowers, as indeed of other bulbous plants, in the middle of the eighteenth century, were Dirk Voorhelm and Voorhelm & Van Zompel at Haarlem. The last firm was succeeded by that of Voorhelm-Schneevoogt; and from a catalogue of that house of 1788 we learn that they offered to the public 155 varieties in various classes, sold in collections with names at 20s., 33s. 4d., and 50s. per 100 bulbs, and in mixture at 12s. 6d. and 15s. per 100. The highest price of any variety was 1s. 8d. a bulb, at which price a dozen different varieties are catalogued. In this list we find the following varieties, which are still in cultivation, viz., Etoile d'Or (yellow, *N. bifrons*), Aigle d'Or (yellow and orange), Grand

Soleil d'Or (yellow and orange), Bazelman major and minor (white and orange), Primo citronier (white with yellow), &c.

From the beginning to the middle of the present century a large number of leading varieties of *N. Tazetta* were grown in the villages to the north of Haarlem, where the heavier soil is well adapted to them. In the later years, however, their cultivation has spread over the whole bulb district of Holland, although there are but a few growers who make a speciality of it. I have consulted the cash-book of one of these growers of *N. Tazetta* in the north of Holland, whose family later on was the most famous in this line. He began to grow in 1785, and in 1791 he sold his first *Tazetta*, viz., Grand Soleil d'Or, at 1s. per dozen, and Bazelman major at 3s. 6d. per dozen.

The varieties of *Polyanthus Narcissus* are much better now than they were a century ago, and amongst the various growers who raised these better forms the firm of V. Schertzer & Sons may be particularly mentioned, the members of this firm having from the very first paid special attention to raising seedlings of this class, and the last quinquennial Haarlem bulb show has again proved that their endeavours have had good success. As before mentioned, only a few of the older varieties are retained in cultivation. The inferior forms are from time to time abandoned, and their places taken by newer and better ones. The best varieties for general cultivation are well known among the trade, as well as by amateurs. As for the most recent novelties, it would be of no use to speak of them here, as only in exceptional cases are they to be obtained as yet. From the registers of our own firm I find that we have at different times cultivated between 500 and 600 varieties, of which at the present moment we retain about one-third.

The principal use made of *Polyanthus Narcissi* is to grow them in pots for early forcing, for which they are very well adapted. The leading "sorts" were formerly in very great demand for this purpose, but in the last few years the cut-flower trade, assisted by easy and quick transport, has developed to such an extent that in those countries where *Polyanthus Narcissi* grow readily without the necessity of protection against frost, and where they flower two or more months earlier in the open ground than they do in Holland, the blossoms of *Polyanthus Narcissus* have become one of the principal articles of

export trade. These countries must necessarily buy from Holland the bulbs required for this new development of gardening, and so whilst the demand for bulbs for forcing purposes is perhaps somewhat less than formerly, the demand from time to time for bulbs for planting becomes very important. Thus the Polyanthus Narcissus still remains a valuable item in the Dutch bulb trade, especially as the comparatively low prices of the bulbs make it possible to purchase them for every purpose.

Like other sorts of Daffodils, *N. Tazetta* may be grown in glasses in water most successfully. From Philip Miller we learn that this method was much practised years ago, but at the present time it has to a great extent fallen out of use; still at our Haarlem bulb shows very fine collections of water-grown *N. Tazetta* have sometimes been exhibited.

For very early forcing the "double Roman" and the single pure white *totus albus* are used, which by good treatment may be had in bloom at Christmas or earlier, provided that the bulbs have been grown beforehand in a southern climate.

This short review would be very incomplete if we did not mention a Polyanthus Narcissus which has attracted much attention lately. I mean the Chinese Narcissus called Grand Emperor, introduced last winter into England for the first time, and of which formerly reports came from the United States. We grew specimens of this Narcissus last winter, and find that a double variety is mixed up with a larger number of single ones. It is a good white-perianthed Narcissus with yellow cup, but not exceeding in beauty the well-known varieties, at least so far as may be judged from the specimens grown, and not a plant to be recommended for general cultivation. This, too, was the opinion of the floral committee at the meeting of the Dutch Royal Horticultural and Botanical Society at Amsterdam, where we exhibited several specimens. A vote of thanks was awarded for them, but they were not considered worth certificating. As has been stated in the gardening papers, this Chinese Narcissus is considered to be the "Flower of Good Luck," and so they are generally grown in the apartments of people of all classes, so as to have it in flower at the beginning of the Chinese year, in February. We think this Narcissus belongs to the plants called "Ssisen" by Engelbert Kaempfer (in his "Amoenitatum exoticarum," &c., fasc. v., 1712), and of which he describes two

varieties, viz., *N. montanus major polyanthos albus*, and *N. montanus polyanthos minor*. We are strengthened in this supposition because Thunberg, in his "Flora japonica" (1784), mentions the double form too, and tells us that this plant grows in a wild state on mountains and other places near Nagasaki, being cultivated also and flowering in January and February. We do not consider the introduction of this plant of any real value, but the way in which it seems to be cultivated in China, and which was recommended by the introducers, deserves great attention. The bulbs are simply placed in a bowl of water mixed with stones to prevent them from floating. The water should, of course, be changed frequently; it is recommended to do so every twenty-four hours. We have tried this method and produced fine flowering plants within four weeks after putting the bulbs in the bowls, which were kept in a forcing-house. Bulbs planted in the ordinary manner in pots take longer to come into bloom. We have also experimented in this way with other sorts of *Polyanthus Narcissi*, and with the same good success. The varieties used were the well-known early-flowering *totus albus*, and the fine Dutch variety, "Queen of the Netherlands." We are quite sure that a great number of the varieties of *N. Tazetta* now in cultivation will be able to be forced in this way. It is a very pleasant manner of room decoration to have *Narcissus* grown in such bowls, and the method is very suitable for growing these flowers for house decoration. We think we may safely recommend amateurs to try this method. We should not like to advise it for very early forcing, nor should the bulbs be put into the bowls earlier than the beginning of December, in order to have flowers of them in January and February, as bulbs at that period generally seem better adapted to strong forcing than they do earlier.

It may be of interest to mention a curious fact, recently observed, viz., the readiness of *Polyanthus Narcissus* bulbs to lie dormant, *i.e.*, to miss pushing shoots for some time. At a meeting of the Royal Dutch Horticultural and Botanical Society this winter, one of the leading bulb firms of Holland showed a pot with flowering *N. Tazetta* "Grand Monarque," which looked quite as well as an ordinarily grown plant. The bulbs, it appears, had been lost in one of the warehouses in the autumn of 1888, and remained there in a dry place till the autumn of 1889, when

they were found again and placed in a pot, so that they had had a sleep of one whole year without being in any way injured; and this is extraordinary, for usually bulbs which remain on the shelf longer than two or three months begin to push their shoots of themselves.

Before closing these remarks it will be well to say a few words on that greatest enemy of Polyanthus Narcissus—the Narcissus-fly (*Merodon equestris*). No Daffodil seems to be more liked by the insect than the *Tazetta*. This pest has been introduced to us in Holland from Italy and the south of France with bulbs of the Double Roman Narcissus. The bulbs on which Réaumur found the *Merodon*, and of which he published an account in 1838, probably came from the south of France. Bouché of Berlin, in 1845, mentions that he had seen the *Merodon* on bulbs sent to him from Italy and France. In the Netherlands for a very long time past every possible means has been adopted to vanquish this enemy. The best results as yet have been attained by the method proposed by Mr. A. C. Groenewegen. It consists in searching for the chrysalides and removing them from the soil just before the plants flower. At that time the insects are found near the surface of the ground, and where this method is adopted it is only in very rare cases that the insect is found in the grounds of careful cultivators, so that the bulbs sent out by respectable establishments may be depended upon as being, except by the merest chance, quite free from the Narcissus-fly. Newly imported bulbs should always be carefully searched, as they sometimes contain this dangerous pest.

DAFFODILS FOR THE LONDON MARKET.

By Mr. JAMES WALKER, F.R.H.S.

THE London Flower Market may be called the pulse of all the other flower markets in the three kingdoms. What to grow in this country to realise a profit is one of the great questions of the day. If we compare the acreage of Daffodils with that of fruit, it will be found very small; but I question if the value of an acre of our fine varieties could be exceeded by that of an acre

of any other crop grown. It will be very difficult to give an idea of the exact number of Daffodils under cultivation, but it is very certain that the number is rapidly increasing; and if we can say that there were ten millions under cultivation at the last Conference in 1884, we can safely say that there are now two hundred millions. At this rate of increase, six years hence our stock will be something enormous.

No doubt the cultivation of Daffodils for market has paid, but the question arises, Will it continue to pay at this rate of increase? for if we compare the prices which the blossoms realised in 1885 with those of the present year, I am satisfied there has been a fall of 50 per cent.

Large quantities of outdoor English-grown Daffodils were sold last year as low as 9*d.* for a dozen bunches, with a dozen blooms in each bunch, a price that cannot pay; but when the grower has them in market, it is better for him to take even that price than to throw them away. This may be taken as the minimum. On the other hand as much as 12*s.* has been obtained for the same quantity. If we look at the enormous quantity of blossoms that come from the South of France, the Scilly and Channel Isles, together with what are forced under glass around London, the British public may rely upon having a good supply of cheap Daffodils from the end of January to the middle of May.

The next consideration is a very important one, namely, which are the best varieties to grow. In classing these, I cannot do better than follow the order of our schedule for to-day, but I shall omit Classes 1, 7, and 9, *Corbularia* and *triandrus* being unsuitable for market cultivation; *gracilis* and *intermedius* being in little demand; and the Tazettas not succeeding so well in the open air about London as they do in a somewhat warmer climate, as, *e.g.*, in the Scilly and Channel Islands.

Class 2.—YELLOW TRUMPETS.

In this section Emperor stands pre-eminent for size, substance, and constitution.

Maximus.—Fine deep yellow; if this was a free flowerer it would rank amongst the first for market purposes. Golden Spur, Henry Irving, Ard Righ, Countess of Annesley, and Tenby are varieties that may be grown in large quantities; to these may

be added *spurius* and Edward Leeds. The latter, though not a fine form, gives flowers when those already mentioned are over.

Class 3.—BICOLORS.

The varieties in this class, with a few exceptions, may be all considered good, yet to my thinking Empress must take the lead—*Horsfieldii*, *grandis*, Dean Herbert, and J. B. M. Camm. I am aware that some growers would place *Horsfieldii* before Empress, but after a number of years of careful observation, I consider Empress to be by far the better plant. It multiplies faster, and nearly every offset will flower; and should a grower have a bad market, and have to keep his flowers over till next market, the blooms of Empress will be in a far better condition than those of *Horsfieldii*.

Class 4.—WHITE OR PALE SULPHUR.

The flowers of this class, up to the present, have always been a drug in market. The cause may be that they are soft and do not stand well; yet a few may be grown to advantage, such as Mrs. F. W. Burbidge, *cernuus*, and *cernuus pulcher*.

With me Mme. de Graaff has not yet flowered, and I cannot speak of the substance this flower possesses, but it is certainly the finest white.

Class 5.—INCOMPARABILIS, BARRII, AND LEEDSII.

This is a very large family, and though possessing a goodly number of fine varieties, yet it requires a good deal of sifting. If there is any class which possesses a variety which towers far above all its fellows it is that of the *incomparabilis*, and that variety is Sir Watkin. Indeed, I question if there is another Daffodil that possesses such a robust constitution, and perhaps no better companion could be found for this variety than Lady Watkin. Though not quite the size of Sir Watkin, yet it possesses more beauty by having a deep-stained orange cup, and though there was only one bulb of this variety in existence in 1884, I have had no less than nineteen flowers this year. The next two that might attempt to hold up their heads here would be Gloria Mundi and Princess Mary.

Barrii.—With the exception of *conspicuus*, it would not be safe for a market grower to cultivate a large quantity of this sec-

tion, yet a few of the following varieties always sell: Maurice Vilmorin, General Murray, and William Ingram.

Leedsii.—Though the tenderest section of this class, yet it possesses several good varieties of great beauty, such as Duchess of Westminster, Madge Matthews, Minnie Hume, Gem, Beatrice, and Acis.

Class 6.—HUMEI, BACKHOUSEI, NELSONI, MONTANUS, MACLEAI, SABINI, BERNARDI, AND TRIDYMUS.

In this class the only section that has any market value is *Nelsoni*, and they are all fairly good.

Class 8.—BURBIDGEI, POETICUS, AND ODORUS.

Burbidgei.—Though the varieties in this section are not very popular, yet if well grown a limited number will always sell, such as Constant, Falstaff, John Bain, and Mary.

Poeticus.—The most popular of all, and perhaps the most plentiful; and here *ornatus* is foremost in every respect. But to secure a continuance of bloom *grandiflorus*, *poetarum*, and *recurvus* are indispensable.

Odorus and *o. rugulosus* are both favourites, and can be sold in large quantities.

Class 10.—DOUBLES.

Sulphur Crown, Orange Phoenix, *incomparabilis pl.*, *Telamonius pl.*, and double white *poeticus* may all be grown in large quantities. I have never heard that anyone has succeeded in forcing the latter, but if it could be done it would greatly add to its value. And anyone who has land that would grow *cernuus pl.* and *capax*, would be sure to find a ready sale for them. In adding to those named the cultivator need not fear to select varieties with long stems, large bloom, decided colour, and those that stand well when cut.

THE CULTURE.

This may to some growers be very simple—to others very difficult; but it may be taken for granted that no one can grow a collection of Daffodils with equal success on one plot of land. In 1881 I planted a collection in a bed of strong heavy land. After remaining there for two years it was found at lifting time

that *capax* and *cernuus pl.* had entirely disappeared, whereas Emperor and Empress had multiplied fourfold—a clear proof that these varieties require different treatment. Since that time we have divided our collection into two parts, the one part consisting of garden forms, and the other of those that are supposed to be wild forms, or at least are not known to be garden varieties. The latter section is planted after a crop of rye, and receives no manure, and the bulbs are not allowed to remain in the ground more than one season, whereas the former receives a liberal supply of stable manure.

To prepare the land, I think it will be found that the plough has taken the place of the fork and the spade; and although, as I have already said, some of the varieties do well with manure, yet no variety likes the bulb to come actually in contact with it; and I fail to see how stable manure can be dug in with the fork or spade to a sufficient depth.

At Ham Green we use Howard's digging plough with four horses, ploughing a depth of 14 inches, which is equal to bastard trenching. When the land is harrowed and rolled, then follows a little double-breasted plough, with a bed 2 feet long, and a wheel in front to regulate the depth; by this method you can get a more level bed for the bulbs than a man can take out with the spade. This plough, when drawing out a fresh row, at the same time covers the row that has just been planted; thus it will be seen that the Daffodil can be grown much cheaper on a large than on a small scale. Fortunately for the cultivator, the varieties in this big family do not require to be planted all at one time. Some growers plant their bulbs directly after they lift them, but I have always found it better to dry and clean the bulbs before planting. We start in August with *ornatus*, and like to have all planting over in September. A safe guide to regulate the time of planting the varieties is the swelling round the base of the bulb. After planting, it is very necessary to rake or harrow the beds once in ten days during the autumn. As soon as the row can be well seen in spring they are hoed. The custom of gathering the buds and forcing them in water under glass is well known; the advantage is, cleaner flowers and earlier to market. But a little judgment is required in selecting the stage at which to pick the various varieties. *Poeticus recurvus* may be gathered before it has burst its spathe; whereas

ornatus ought to have burst and the bud to have turned, and no trumpet should be gathered till the perianth has burst free from the trumpet. The only danger in this system is, that if they have stood too long in water the flowers seem too full of water, and therefore are soft and do not carry well.

The question naturally arises, Can we grow Daffodils in this country as well as in any other? The experience of the last six years says emphatically Yes.

I have examined *ornatus* growing under a good cultivator on the Riviera, and both foliage and bulb were quite one-third less than those grown in this country. If the demand for bulbs for forcing goes on increasing at the present rate, I am satisfied that we shall be able to meet the demand, and that of America also; and I am satisfied that with annual lifting and planting, and that done at the proper time, we need fear no competitors.

DISCUSSION.

Mr. JENKINS said he would like to make one or two observations in regard to some statements in Mr. Walker's paper. He agreed with that gentleman in his remarks about *N. Horsfieldii*, which could not be compared with *N. Empress*. The flowers of the latter could not be surpassed in the market. The fault of *N. Horsfieldii* was the lack of substance in the segments of the flower, and the only thing in its favour was that it produced its flowers a few days earlier, but in regard to increase *Empress* was far superior. In reference to *N. cernuus plenus*, Mr. Jenkins said that Mr. Walker regarded that variety as good for market purposes. He did not quite agree with the lecturer in that view, as he was of opinion that *N. cernuus plenus* did not pay for the outlay on it. As to the planting of *N. poeticus ornatus* first, as Mr. Walker advised, he would like to know the reason for such recommendation. The Tenby Daffodil (*N. obvallaris*) was, in his opinion, one of the very best and earliest flowering kinds, appearing several weeks before *poeticus ornatus*, and, in his experience, being of a thoroughly good constitution. With regard to the question of blindness in the flowers of double *poeticus*, he thought no one could explain or knew the reason of it, he himself having experimented with plants in frames and in the open air with a view to discovering and preventing the evil. He had even examined the bulbs at all seasons, according

to a hint he had received from Dr. Masters, to see if he could discover the real cause of the disease, but without any result. The bulbs, as a rule, got well above the ground in a quite healthy condition, but after that they became affected.

The Rev. C. WOLLEY-DOD said, in reference to the "Hoop-petticoat" Narcissus (*Corbularia conspicua*), that this was a difficult species to grow, although he had a certain variety of it which grew freely in his own garden. This pretty plant belonged to a section requiring somewhat different treatment from other Daffodils. In their native country they enjoy a dry atmosphere, and, if this condition could be imitated in England, Mr. Wolley-Dod believed we should succeed better with them. He had seen it growing in a rockery in Aberdeen, where its roots were kept dry, so that it was in no way a delicate plant.

In reference to the Tenby Daffodil, he said there seemed to be some difficulty in recognising what the Tenby Daffodil really was. It had been stated that it was *N. obvallaris*—a variety or form of *N. pseudo-narcissus*, but Babington mentions it as *lobularis*. It is one of the earliest-flowering kinds, coming into bloom in March, and sometimes in February. Some said that *N. pallidus præcox* was better, but probably Mr. Walker would disagree with this, as it was not so robust as the Tenby Daffodil, and could not be so well established for market purposes.

As to Daffodils grown for market, Mr. FRASER said the market people were the ones to show us what could be done with Daffodils, and what they had done had been seen at the various meetings of the R.H.S., where it was shown that those who grew for the market could produce much better flowers than amateur growers could.

Replying, Mr. WALKER referred to the going blind of double *poeticus*, and said ten years ago his Daffodils suffered very much from blindness, but after careful observation he came to the conclusion that the cause of this disease was weakness, for if the double *poeticus* was allowed to remain more than two years in the same situation it would be found that the number of blind flowers would increase, but in the first and second year hardly 10 per cent. ever went blind. This could be cured by good cultivation and annual lifting.

In regard to the planting of *p. ornatus* first, Mr. Walker

said it would be found that this Daffodil "fibred" before any other, and this was a sure sign that it should then be planted. He gave the merits of *Empress* and *Horsfieldii* as he found them, but it was clear that one could not get every plot of land to grow a collection equally well, for he noticed that *Horsfieldii* did better in some soils than *Empress*, but, on the whole, *Empress* did best with him in every way. Mr. Walker said he thought the Tenby Daffodil would never become popular in the neighbourhood of London, simply because there was too much manure in the soil. *Pallidus præcox* dies out under cultivation, and it is not a favourite in the market. He did not know the reason why, but perhaps the ladies could explain that better than he.

Mr. JENKINS, in reference to manure, said that at the present time he could show many thousands of Tenby Daffodils of the best variety which were grown in soil which had been manured for several years in succession. He thought it was more a question of soil than of the dung-cart, and he could not agree with keeping bulbs free from dung.

Mr. BURBIDGE said he hated manure in the cultivation of plants, but its use depended to a great extent on the moisture of the soil. If the land were well drained a great deal of difference would be made. In reference to an appeal as to the Tenby Daffodils grown in manured soil, Mr. Burbidge said that Mr. Jenkins had the finest set of Tenby Daffodils he ever saw in his life.

The Rev. W. WILKS said: There can, I think, be no doubt whatever but that the Daffodil as a flower is rapidly growing and increasing, and most deservedly so, in popular favour, and one of the principal results of this Conference will, I hope, be to call the attention of people to the fact that a vast number of beautiful forms and varieties of the flower may be quite as easily cultivated as the few sorts hitherto commonly found. I do not think that I should have risen to say anything had it not been for a remark which fell from Mr. Fraser that "of course amateurs cannot produce such fine flowers as market or trade growers do." Now that is a statement which I venture entirely to traverse. In my humble opinion an amateur can grow quite as good flowers as any trade grower. The amateur, of course, has this disadvantage in exhibiting, that whereas his professional

neighbour has perhaps ten or twenty thousand flowers of a sort to select his best dozen blooms from, the amateur has not a hundredth part of the number to choose from ; but given only the same number of bulbs, and the tradesman's exhibit would, I think, be no whit in advance of the amateur's. And I hope all visitors to this Conference will bear it in mind that the great majority of all the beautiful sorts of Daffodils to be seen here to-day may be as easily grown by themselves as by those who exhibit them now. And this seems to me one of the great points of merit which Daffodils possess—anyone can grow them, and many of them grow better in our much-abused English climate than in any other country in the world. There are no glass houses, no skilled gardener, no expensive manures or applications wanted, but the veriest beginner in gardening can succeed with the great majority of varieties if he will only follow one or two very simple rules. To begin with, he must procure his bulbs as early in the autumn as possible, and plant them at once. I always like to plant not later than the first week in August, although they will do very fairly well planted even as late as November ; but early planting produces robust growth, and helps the multiplication of bulbs, which is such a delight to the amateur. How he rejoices to dig up in July three bulbs where he only planted one last August ! And this I count as a second point of merit Daffodils possess : Most of them increase very rapidly by side-bulb growth.

Almost the only other rule a beginner (and I only venture to speak to quite beginners) requires to know is that the Daffodil, though it will bear a little rough treatment, and at best requires but little attention, still will not thrive if absolutely neglected. No one must think that the bulbs once planted may be left for good and all to take care of themselves. A lady the other day said to me, " Oh, Mr. Wilks ! Daffodils won't bloom with me ; can you tell me the reason ? They do very well for a year or two, and then grow nothing but leaves." " When did you move them last ? " I inquired. She answered, " I have not allowed them to be disturbed since they were planted eleven years ago ! " I am afraid I was rude enough to just shrug my shoulders and say, " Mais voilà ! " The truth is that Daffodils will submit to inattention for two or three years together, but they increase so fast that if left undivided for longer than that they gradually cease to

flower and then they die out. They ought to be taken up and separated every second or third year at least, and the stock will increase more rapidly still if they are lifted up every year.

There have been great Daffodil-growers in the past, of whom you have already heard in the excellent papers which have been read, but I think I may truly say that our present Daffodil fanciers have not been more than about ten or twelve years at their hobby, and marvellous indeed have been the results of all their labours. And yet how many sorts of Daffodils can even now be called common, or usually to be met with in gardens? Not more than five, I think, viz. : (i.) The common wild English Daffodil, called *pseudo-narcissus* ; (ii.) the great double yellow, called *Telamonius*, still one of the very best ; (iii.) *biflorus*, a poor yellow and white flower with a very strong, almost overpowering scent ; (iv.) the common Poets' or Pheasant-eye, *poeticus recurvus* ; (v.) and the double Poets' or Gardenia-flowered. Now, I do not think that by stretch of language can any other of the now numberless hardy outdoor varieties be called common or usual. I do hope, therefore, that one result of this magnificent show and Conference will be to induce people to try some of the finer forms, such as Emperor, Empress, Sir Watkin, *Horsfieldii*, Troilus, *grandis*, J. B. M. Camm, Ard Righ, *princeps*, double *odorus*, C. J. Backhouse, *Barrii conspicuus*, *poeticus ornatus*, and a few others of thoroughly good constitution and habit. And I venture to say that, at the present price at which the bulbs I have named can be obtained, it will, considering the rapidity of increase, be not only worth while to buy, but absolutely a very fine investment of money ; and as an example of this I may say that in 1888 I paid £5. 5s. for a single bulb of Mme. de Graaff, and now in 1890 I have five fine bulbs of it, and they still sell at £5. 5s. each. No one therefore need, I think, grudge a somewhat high price for a variety if he first discovers that it has a thoroughly satisfactory and robust constitution.

Mr. Walker laid stress on the early planting of *poeticus*, and I should like to support this, for though I take my bulbs up always early in July, when often the *poeticus* foliage has not died away, yet the young roots—next year's roots—I generally find to have already started in all the *poeticus* section. It stands to reason therefore, I think, that *poeticus* requires the earliest planting—

indeed I do not think that any of the *poeticus* group should be kept out of the ground an hour longer than necessary.

A good deal has also been said about *obvallaris*, the Tenby Daffodil. We can only speak of things as we find them, but in my garden I cannot grow *obvallaris*. It is most disappointing, for do what I will no spot seems to suit it, and every year it grows less and threatens to die out altogether. I therefore cannot recommend it, but the one I grow in its place, Troilus, is a plant of magnificent constitution and enormous capacity both for seed-bearing and increase of bulbs. The flower is not unlike the Tenby, and blossoms at just the same time.

Before he sat down, Mr. Wilks said he was quite sure that the Conference would not like to separate without giving a hearty vote of thanks to those gentlemen who had been kind enough to read papers. The papers had taken a very practical form, and when they were published in the Society's *Journal* would afford much valuable information to their readers—both amateurs and professionals.

In the vote of thanks he ought also to include those gentlemen of the trade who had been so kind as to bring their splendid exhibits to the Conference. He felt confident that there had never been seen such a grand display as that which was then spread before them, and he begged to propose a hearty vote of thanks both to the gentlemen who had read papers and to those who had exhibited flowers.

Mr. J. FRASER, in seconding the vote of thanks, said that no doubt amateurs could produce individual flowers quite as good as any in the trade, and he must say that those exhibited that day by Mr. Wilks were some of the very best he had seen.

Mr. J. G. BAKER then put the vote of thanks, which was carried unanimously by an appreciative audience.

The Rev. C. WOLLEY-DOD replied on behalf of those who had come to give the Conference the benefit of their experience, and said he was sure they were all much obliged to the Secretary and the Chairman for their kind vote of thanks, and were always most happy to do anything they could to further the objects of the meetings. What was particularly wanted, however, was to provoke discussion, for a great deal more would be learnt that would be of great value to all if those who took part in the discussions did so with the determination to contradict anything which they heard and knew to be contrary to their individual experience.

NOTE ON THE DAFFODIL CONFERENCE.

By the Rev. W. WILKS, M.A., Sec. R.H.S.

IN writing a note on the Conference after it is over, it is obvious that one writes not for the skilled cultivator, who can trust his own experience and knowledge, but for those Fellows of the Society who have hitherto paid no particular attention to Daffodils.

And first it may interest those who were unable to be present if I give a complete list of the varieties shown at this Conference; it may also, I think, form a valuable record and reference list for future generations of Daffodil-growers. And here I desire to acknowledge my grateful obligation—first to Mr. J. W. Barr and Mr. W. Logan for assisting me in drawing up the following list, and secondly to the Editors of the *Gardeners' Chronicle* and of the *Journal of Horticulture*, who have so kindly allowed me the use of the accompanying plates, in order that the uninitiated may form a better idea of the sort of flowers included in the various classes into which, for the better examination and comparison of the flowers, each exhibitor's collection was subdivided.

COMPLETE LIST OF THE VARIETIES EXHIBITED AT THE CONFERENCE, APRIL 15, 16, 17, 18, 1890.

Class 1.—CORBULARIA.

Citrina.

Conspicua.

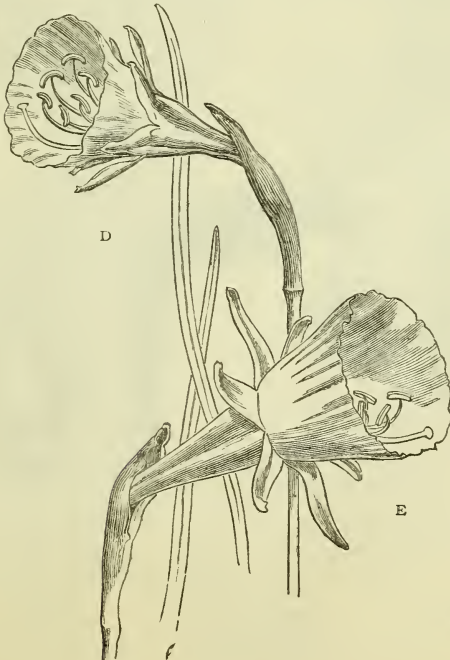


FIG 8—CORBULARIA, or Hoop-petticoat Daffodils (see p. 323).

Class 2.—AJAX, yellow varieties of.

Abscissus	Havelock	Oporto Yellow
Achilles	Henry Irving	Prime Minister
Ard Righ (Yellow King)	Her Majesty	Prodigy
Bastermil	Hudibras	Prince George
Blondin	J. G. Baker	Queen of Spain
Captain Nelson	John Nelson	P. R. Barr
Countess of Annesley	Johnstoni	Robert Boyle
Cornish Beauty	King Umberto	Santa Maria
Coronatus (Gen. Gordon)	Major	Shirley Hibberd
Cressida	Maximus	Sir W. Harcourt
Cyclamineus	M. J. Berkeley	Spurius
Daniel Dewar	Morning Star	Scoticus
Edith Barber	Mrs. Geo. Cammell	St. Brigid
Eliza Turk	Mrs. H. J. Elwes	Thos. Spanswick
Emperor	Nanus	T. Moore
Glory of Leyden	Nobilis	Troilus
Golden Spur	Obvallaris	Tottenham Yellow

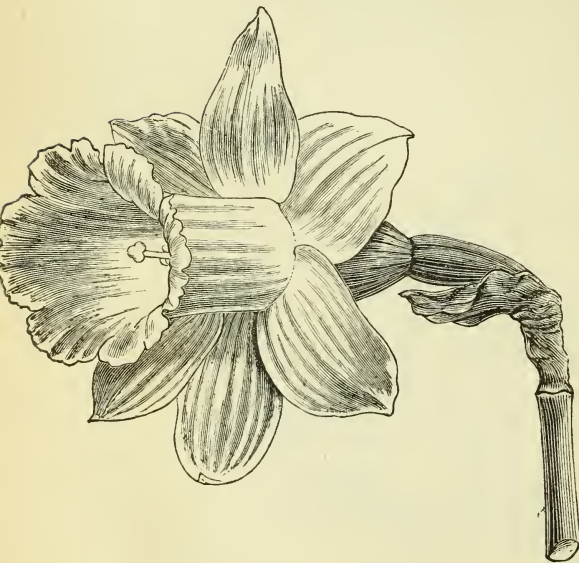


FIG. 9.—A YELLOW AJAX.

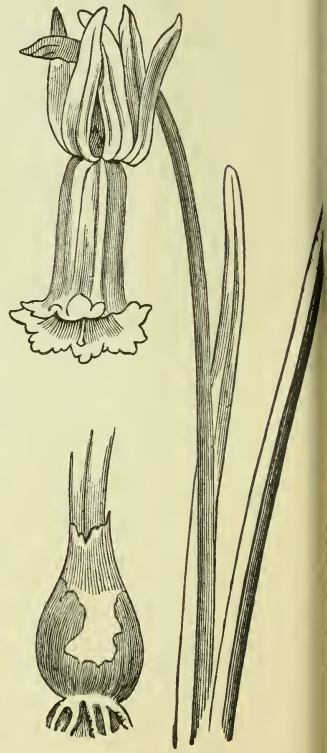


FIG. 10.—AJAX CYCLAMINEUS.

Class 3.—AJAX, bicolour varieties of.

Bicolor	Grandis (Grandee)	Michael Foster
Alfred Parsons	Harrison Weir	Murrell Dobell
Dean Herbert	Horsfieldii	Princeps
Empress	James Walker	T. A. Dorrien-Smith
G. H. Barr	J. B. M. Camm	Wm. Robinson

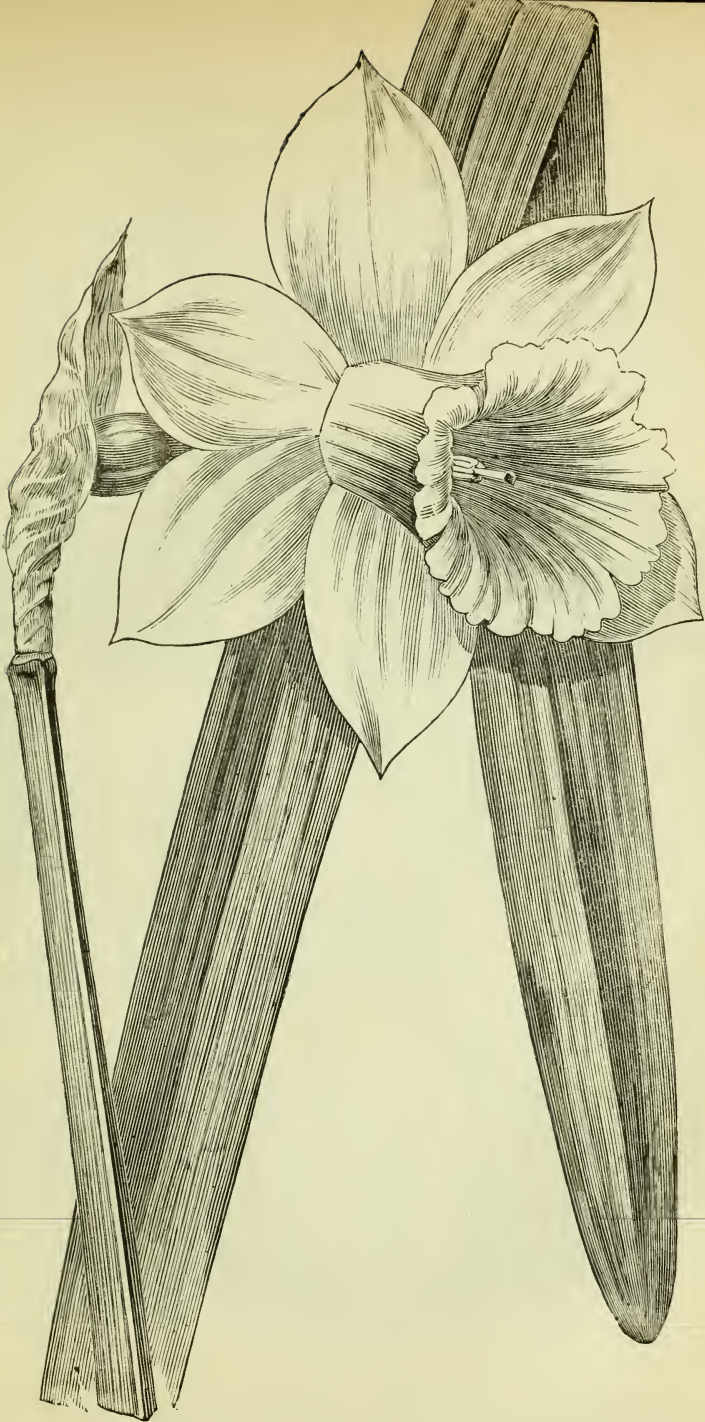


FIG. 11.—A BICOLOUR AJAX; trumpet deep yellow, perianth white or very pale sulphur.

Class 4.—AJAX, white or pale sulphur varieties of.

Albicans	Gladys	Mrs. Vincent
Antoinette Sterling	H. Backhouse	Moschatus
Bridesmaid	James Veitch	Pallidus præcox
Cernuus	Lady Grosvenor	Princess Ida
Cernuus pulcher	Madame de Graaff	Robert Boyle
Colleen Bawn	Marchioness of Lorne	Silver Bar
C. W. Cowan	Minnie Warren	Sir S. Northcote
Dr. Hogg	Mrs. W. P. Milner	Snowflake
Duchess of Connaught	Mrs. F. W. Burbidge	Tortuosus (Leda)
Exquisite	Mrs. J. B. M. Camm	W. P. Milner
F. W. Burbidge	Mrs. Thompson	William Goldring

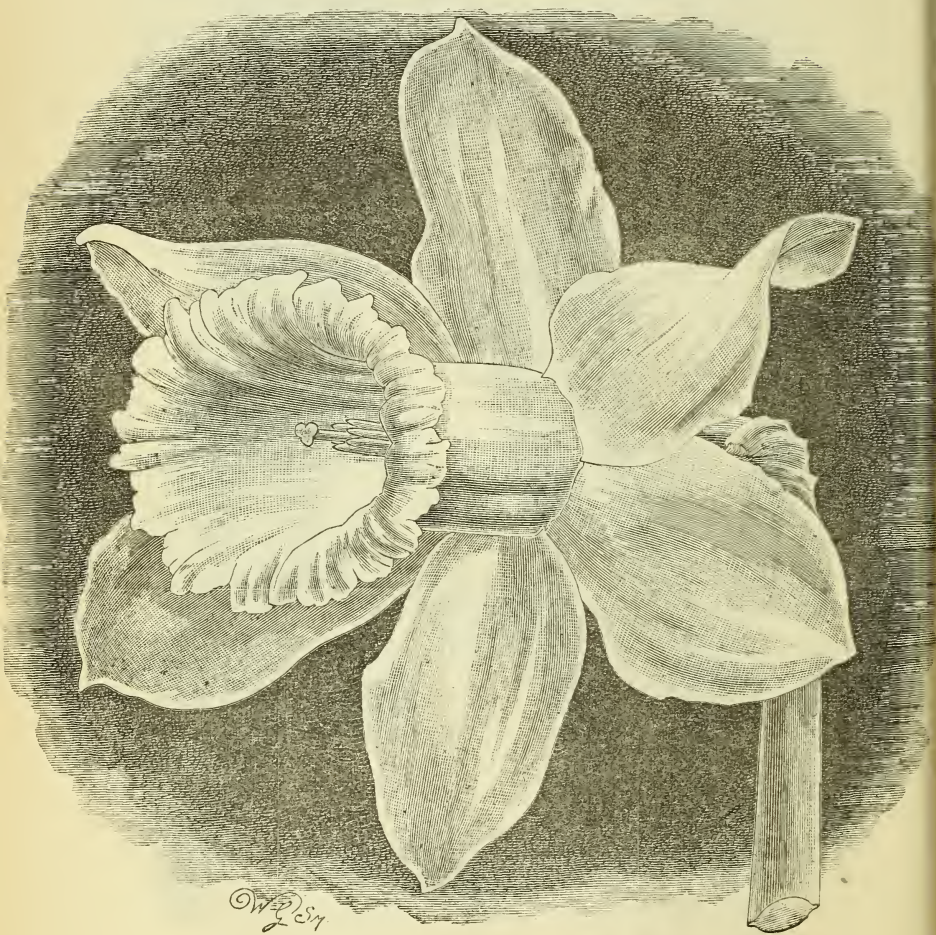


FIG. 12.—AJAX MME. DE GRAAFF. This is by far the largest and most robust White Ajax. The majority of the white varieties have a much smaller blossom, which generally droops at an acute angle from the top of the flower-stalk.

Class 5.—INCOMPARABILIS, BARRII, and LEEDSII.

Incomparabilis :	Mary Anderson	Sensation
Annie Baden	Mrs. Syme	William Ingram
Astræa	Miltiades	Leedsii :
Autocrat	Poiteau	Arsinœe
Albert Victor	Princess Mary	Beatrice
Beauty	Prince Teck	Ceres
C. J. Backhouse	Queen Sophia	Cybele
Cynosure	Queen Bess	Duchess of Westmin-
Dove	Sir Watkin	ster
Edward Hart	Splendens	Elegans
Frank Miles	Semipartitus	Gem
Fair Helen	Stella	Grand Duchess
Figaro	Sunlight	Homer
Goliath	Titan	Hon. Mrs. Barton
Gog	Barrii :	Ianthe
Gloria Mundi	Barrii (type)	Katherine Spurrell
Gwyther	Conspicuus	Leedsii (type)
Hogarth	Crown Prince	Mrs. Langtry
King of the Nether-	Flora Wilson	Madge Matthews
lands	General Murray	Minnie Hume
Leedsii	John Stephenson	M. M. de Graaff
Lorenzo (C. Hooper)	Maurice Vilmorin	Palmerston
Longshanks	Miriam Barton	Princess of Wales
Mrs. A. F. Barron	Mrs. Dyer	

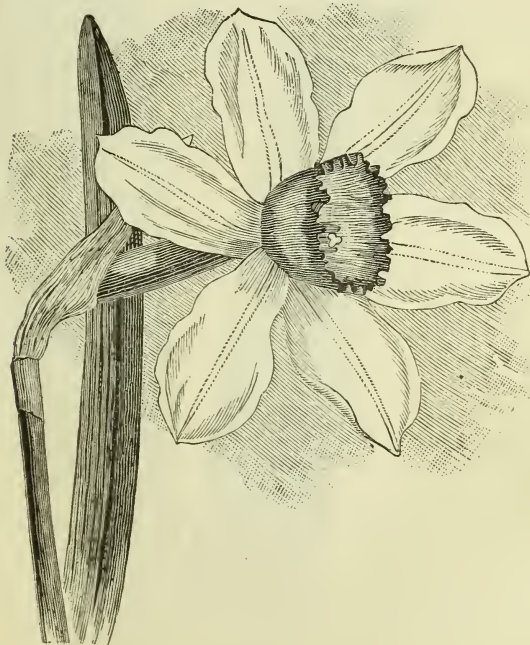


FIG. 13.

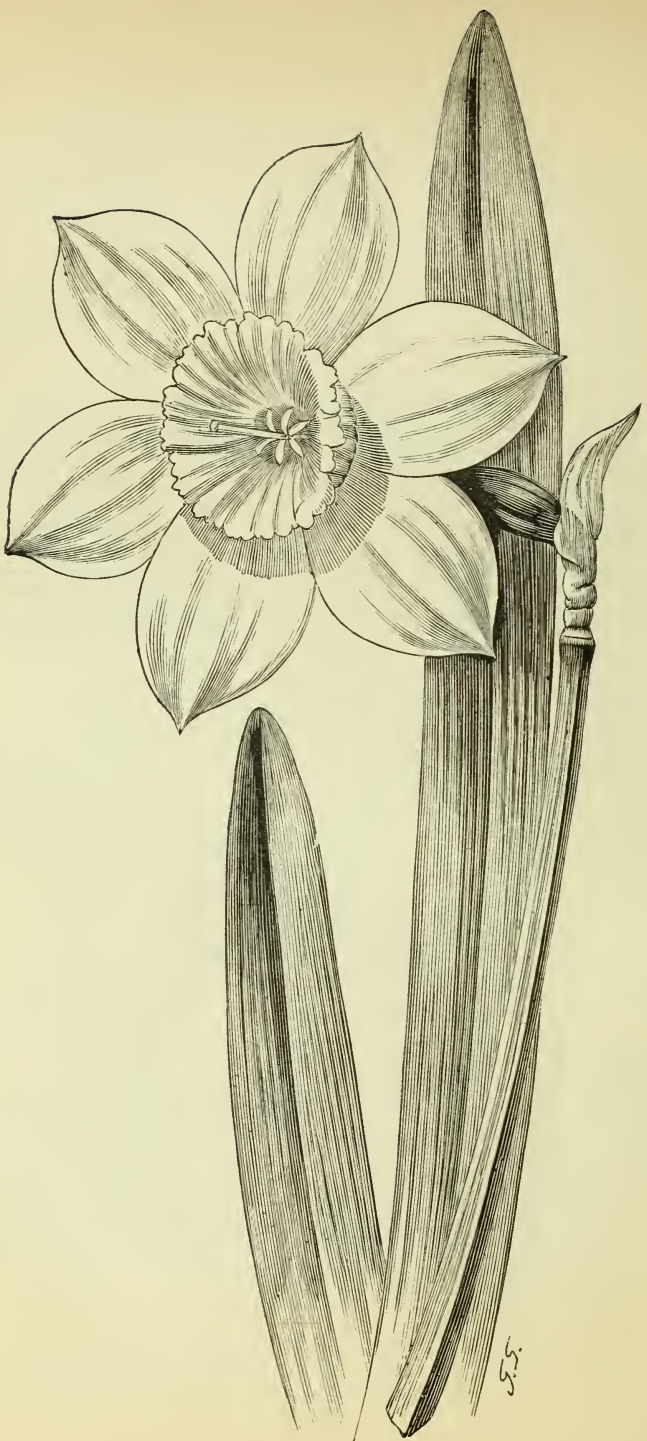


FIG. 14.



FIG. 15.

Figs. 13, 14, and 15 give an idea of the great variety of forms to be found in Class 5, and the colour of the flowers varies as much as their form. Some are all yellow, some deep yellow and sulphur, some all white, some white and yellow, and some have the cup margined, or even stained throughout, with deep orange-red.

Class 6.—HUMEI, BACKHOUSEI, NELSONI, MONTANUS, MACLEAI, SABINI,
BERNARDI, and TRIDYMUS.

Humei :

Concolor (Hume's)

Giant (Hume's)

Backhousei :

Backhousei (type)

Joseph Lakin

Wolley Dod

William Wilks

Nelsoni :

Aurantius

Major

Minor

Mrs. C. J. Backhouse

Pulchellus

Stanley

William Backhouse

Montanus :

Montanus (type)

Macleai :

Macleai (type)

Tridymus :

Duke of Albany

Princess Alice

S. A. de Graaff

Class 7.—TRIANDRUS.

Albus.



FIG. 16.—TRIANDRUS ALBUS (see p. 323).

Class 8.—BURBIDGEI, POETICUS, ODORUS, JUNCIFOLIUS, and JONQUILLA.

Burbidgei :	Little John	Poetarum
Burbidgei (type)	Mary	Stellaris
Agnes Barr	May	Tripodalis
Bacchus	Mercy Foster	Odorus :
Baroness Heath	Model	Campernelli
Crown Princess	Princess Louise	Heminalis
Constance	St. John's Beauty	Minor
Dandy	Vanessa	Rugulosus
Ellen Barr	Poeticus (fig. 18) :	Juncifolius :
Falstaff	Angustifolius	Rupicola
John Bain	Grandiflorus	Jonquilla :
Lottie Simmons	Ornatus	Jonquilla (type)



FIG. 17.—THE JONQUIL.

Class 9.—GRACILIS, INTERMEDIUS, POLYANTHUS and DOUBLE POLYANTHUS.

Gracilis :	Gannymede	Marie
Tenuior	Gloria Mundi	Merveille
Intermedius :	Gloriosus	Mont Cenis
Minor	Grootvoorst	Mercurius
Polyanthus (fig. 1	Grand Monarque	Muzart orientalis
Admiral Napie.	Grandeur Triumphant	Patulas
Adonis	Grand Soleil d'Or	Prince de Metternich
Apollo	Her Majesty	Princess of Teck
Aurora	Illustre Soleil	Prince of Orange
Bathurst	Isabella	Paper White
Bazelman major	Jaune Constant	Queen Victoria
Bazelman minor	Jaune Supreme	Queen of the Nether-
Bounteous	Lacticolor	lands
Bouquet Triumphant	La Fiancée	Sir Isaac Newton
Blanche Delicate	La Constance	Schizanthus orientalis
British Queen	Laura	Socrates
Charles Dickens	Libertas	Staten General
Chloris	Lord Canning	Verlina
Diana	Magnifique	Zinnerust
Etoile d'Or		

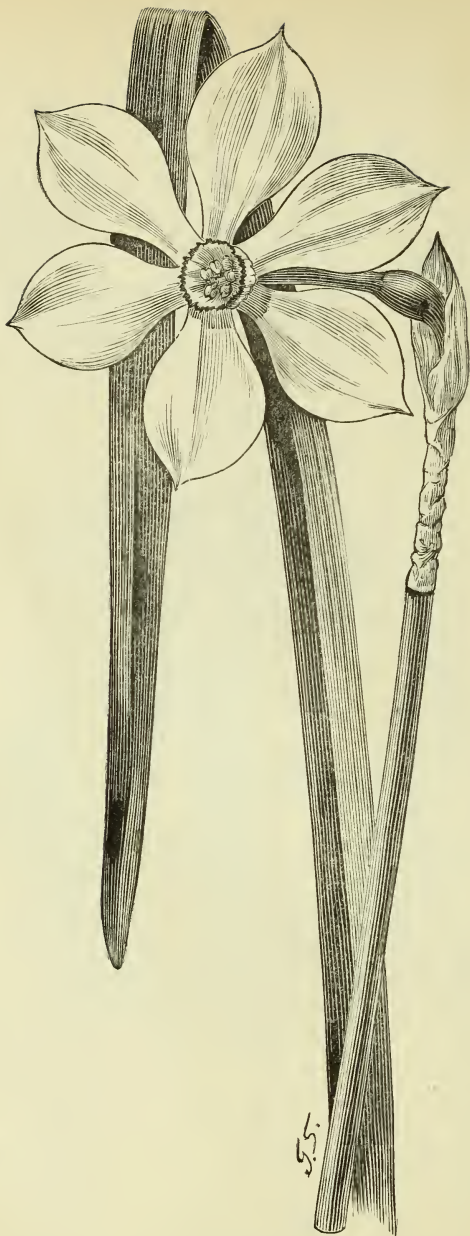


FIG. 18.—THE POETS', or, as it is sometimes called, THE PHEASANT-EYE
DAFFODIL.

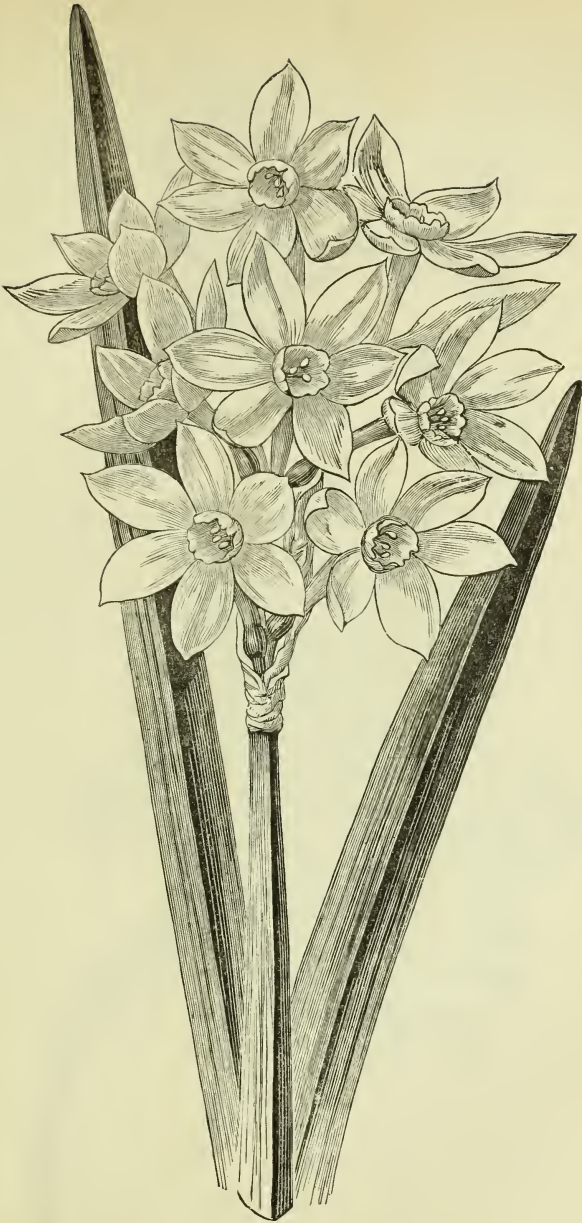


FIG. 19.—A POLYANTHUS OF TAZETTA NARCISSUS, sometimes called
THE CLUSTERED, or BUNCH-FLOWERED DAFFODIL.

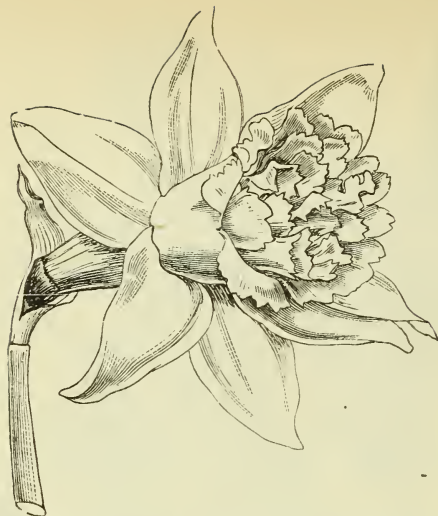


FIG. 20.—DOUBLE CERNUUS, white or very pale sulphur.



FIG. 21.—CAPAX (EYSTETTENSIS). (Double Odorus is somewhat similar in form.)

Class 10.—DOUBLE DAFFODILS of all kinds (except POLYANTHUS).

Ajax :	Telamonius	Albus Aurantius
Capax (Eystettensis)	Tradescanti	(Orange Phœnix)
Cernuus	Incomparabilis :	Albus Sulphureus
Lobularis Grandi-	Aurantius	(Sulphur Phœnix)
plenus	(Phœnix)	Odorus :
Rip van Winkle		Odorus

Class 11.—NEW OR UNNAMED SEEDLINGS OF THE AJAX CLASSES.

Yellows :	R. P. Ker	Duchess of Teck
Buttercup	Samson	Mme. Plempe
Clarissa	Vandyck	Mrs. Walter Ware
Fred Moore	Vondel	Mr. Bowa
Gideon	Wide-awake	Ouida
Golden Vase	Wieniawski	White :
Lena	Bicolours :	Agnes Kingsbury
Pretty Jane	Dainty Maid	Dante

Class 12.—NEW OR UNNAMED SEEDLINGS OF ANY OTHER CLASS THAN AJAX.

Incomparabilis : Lulworth

In addition to the living flowers shown, Professor Oliver, F.R.S., exhibited a most interesting picture of *Narcissus incomparabilis fl. pl.*, painted by E. D. Ehret, who died in 1770, showing that the flower was identical with that which we now know under the name of *N. incomp. albus aurantius*, or Orange Phœnix.

C. W. Cowan, Esq., sent platinotypes of nine different varieties ; J. D. Pearson, Esq., sent photographs of six groups of flowers ; Rev. A. Rawson sent photographs of *triandrus* and *Corbularia monophylla* to illustrate their suitability for pot culture.

At the time of the Conference a paper of inquiry as to the best varieties for different purposes was circulated amongst the principal successful growers of Daffodils throughout the country—amateurs and market-growers and nurserymen. The answers received were not so numerous as had been hoped, but they were all from thoroughly reliable sources, so that the following tables, which have been compiled from the returns, may be considered to be representative. At the same time it should be borne in mind that different soils and situations suit different varieties. For instance, one well-known grower says: "Horsfieldii has never given me one decent flower, though I have tried to grow it for the last twelve years. Grandis is my favourite for everything. Empress also is very fine." Whereas another almost as ex-

perienced grower writes: "I know nothing to equal *Horsfieldii*." The first gentleman lives on light dryish sandy loam in the South, the latter in the northern Lake district, where rain is never a stranger, and the soil is generally heavier.

Many of the white *Ajax* varieties are distinctly of delicate constitution, and there appears to be a pretty general consensus of opinion that the whole of the *Spurius* group are very particular as to soil, and often die out. Similar complaints are made by some of *Mary Anderson*, *Ard Righ*, *Pallidus præcox*, *Obvallaris*, *Mrs. F. W. Burbidge*, *Vicar of Lulworth*, and *double Cernuus*.

None of the *Corbularias* (*Hoop-petticoats*), or *Triandrus* (*Calathinus*), or *Juncifolius*, or *Rupicola*, or *Cyclamineus* should, I think, be attempted out of doors by any but a very skilled hand or in a most favoured spot.

The following lists have been drawn up from the returns of the principal *Daffodil*-growers, and may be explained by taking *List I.* as an example. In this case 17 growers sent in returns of what they considered to be the 12 best single *Ajax* or *Trumpet Daffodils*, and of these 17 experts 16 mentioned *Empress* as among the best twelve; 15 mentioned *Emperor*, 15 mentioned *Grandis*, 14 mentioned *Horsfieldii*, and so on. Therefore *Empress* is entitled to the first place, *Emperor* and *Grandis* are equal second, *Horsfieldii* takes the fourth place, and so on.

LIST I.

The 12 best Single (yellow or bicolor) *Ajax* for exhibition.
(17 voters.)

	Votes		Votes
1. <i>Empress</i> (fig. 11)	16	10. <i>John Nelson</i>	7
2. <i>Emperor</i>	15	10. <i>Obvallaris</i>	7
2. <i>Grandis</i>	15	12. <i>Ard Righ</i>	6
4. <i>Horsfieldii</i>	14	12. <i>Henry Irving</i>	6
5. <i>J. B. M. Camm</i>	13	12. <i>Bicolor</i>	6
5. <i>Maximus</i>	13	15. <i>Glory of Leyden</i>	5
7. <i>Golden Spur</i>	12	15. <i>Michael Foster</i>	5
8. <i>Captain Nelson</i>	10	17. <i>Dean Herbert</i>	4
9. <i>Countess of Annesley</i>	8		

It may be remarked that, had *Glory of Leyden* been better known, it would probably have had a more prominent position assigned to it, but being so new, and as yet so expensive, it is known to but few. It is a yellow flower, in size and form somewhat resembling the white *Mme. de Graaff* (fig. 12).

LIST II.

The 12 next best Single (yellow or bicolour) Ajax for exhibition.
(13 voters.)

		Votes			Votes
1.	Princeps	7	4.	James Walker	5
2.	Dean Herbert	6	8.	Mrs. Geo. Cammell	4
2.	Henry Irving	6	8.	Golden Plover	4
4.	P. R. Barr	5	8.	Bicolor	4
4.	Ard Righ	5	8.	Edward Leeds	4
4.	Michael Foster	5			

LIST III.

The 6 best Single White Ajax. (17 voters.)

		Votes			Votes
1.	Mrs. J. B. M. Camm	11	6.	Moschatus	5
2.	Colleen Bawn	10	8.	Cernuus	4
3.	Cernuus pulcher	8	8.	Dr. Hogg	4
4.	Albicans	7	8.	Pallidus præcox	4
5.	Tortuosus (Leda)	6	8.	Mrs. F. W. Burbidge	4
6.	Mme. de Graaff	5			

The same may be said of Madame de Graaff (fig. 12) in this list as was remarked of Glory of Leyden in List I. Lady Grosvenor and Mrs. Vincent, if better known, would also certainly have found a place.

LIST IV.

The 6 best Double Daffodils for general purposes.

		Votes			Votes
1.	Telamónius	13	6.	Capax	9
1.	Poeticus	13	7.	Cernuus	8
1.	Sulphur Phoenix	13	8.	Incomparabilis	4
4.	Orange Phoenix	12	8.	Pseudo-Narcissus	4
5.	Odorus	10			

LIST V.

The 12 best Single for exhibition of all other classes from Incomparabilis to Jonquilla, Polyanthus excluded. (17 voters.)

		Votes			Votes
1.	Sir Watkin	17	9.	Cynosure	6
2.	Barrii conspicuus	14	9.	Maurice Vilmorin	6
2.	Duchess of Westminster	14	11.	Minnie Hume	5
4.	C. J. Backhouse	11	11.	Flora Wilson	5
4.	Princess Mary	11	11.	Nelsoni	5
6.	Poeticus ornatus	8	14.	Gem	4
6.	Catherine Spurrell	8	14.	Sensation	4
8.	Gloria Mundi	7	14.	Poetarum	4

The same may be said of Gloria Mundi as was remarked of Glory of Leyden in List I.

LIST VI.

The 12 next best, as in List V. (14 voters.)

	Votes		Votes
1. Mrs. Langtry	9	4. Nelsoni major	5
2. Beauty	7	4. Beatrice	5
3. W. Wilks	6	4. Cynosure	5
4. Maurice Vilmorin	5	9. C. J. Backhouse	4
4. Amabilis	5		

LIST VII.

The 6 best Polyanthus for out-of-doors. (11 voters.)

	Votes		Votes
1. Soleil d'Or	9	4. Newton	6
2. Bazelman major	7	5. Her Majesty	5
2. Grand Monarque	7	6. Orientalis	4

It is doubtful whether any of the Polyanthus Daffodils are quite hardy in the northern and north midland counties.

LIST VIII.

The 12 best Ajax for garden effect, having regard to constitution, vigour, and varied season. (17 voters.)

	Votes		Votes
1. Emperor	17	7. Countess of Annesley	8
2. Empress	14	9. J. B. M. Camm	6
2. Horsfieldii	14	9. Ard Righ	6
2. Grandis	14	11. Mme. de Graaff	5
5. Obvallaris	10	11. Rugilobus	5
6. Golden Spur	9	13. Pallidus præcox	4
7. Maximus	8		

The voters must have assumed that they were not to include doubles, otherwise it is difficult to account for the omission of *Telamonius plenus*, the common great double yellow Daffodil, probably the most effective of any for garden purposes, and of grand constitution and vigour.

LIST IX.

The 12 best of all other classes, having regard to constitution, vigour, and varied season. (16 voters.)

	Votes		Votes
1. Sir Watkin	12	8. Amabilis	5
1. Barrii conspicuus	12	8. Rugulosus	5
3. Poeticus ornatus	11	8. Odorus	5
4. Cynosure	10	11. Poetarum	4
4. Princess Mary	10	11. C. J. Backhouse	4
6. Nelsoni major	8	11. Frank Miles	4
7. Duchess of Westminster	6	11. Minnie Hume	4

From the foregoing lists, and from notes added to some of the returns, we may safely infer that the best varieties for ordinary garden purposes, having regard to constitution, will be found amongst the following, and I name them in the order in which I should personally place them:—

A. *Single Yellow Ajax*.—Emperor, Glory of Leyden, Captain Nelson, Countess of Annesley, John Nelson, Troilus (fig. 9), Ard Righ, Rugilobus. Not one of these equals Maximus in colour, but unfortunately it seems in some soils to be a shy bloomer, but it is a grand variety.

B. *Single Bicolor Ajax*.—Empress, Grandis, J. B. M. Camm, Horsfieldii, Princeps, Dean Herbert, Michael Foster. Empress (fig. 11), Grandis, and Horsfieldii are, to people unacquainted with them, very similar, and might sometimes be mistaken for each other. Horsfieldii is, perhaps, a trifle the largest, and a few days the earliest of the three, but it lacks the splendid substance of its rivals. Empress (fig. 11) and Grandis are glorious flowers, the one opening a day or two before the other. Dean Herbert and Michael Foster are both good, but somewhat similar.

C. *Single White Ajax*.—Mme. de Graaff (fig. 12), Lady Grosvenor, Cernuus pulcher, Colleen Bawn, Mrs. J. B. M. Camm, Mrs. Vincent, Cernuus. Mme. de Graaff appears to be not only undoubtedly the finest, but also the best constituted of all the varieties of white Ajax.

D. *Double Daffodils*.—Telamonius, Poeticus, Orange Phœnix, Sulphur Phœnix, Incomparabilis, Odorus. The Double Jonquil should never be absent from gardens in which it will grow; it scents the air all round. Telamonius is still the best all-round Daffodil for out-of-doors effect. It does well planted in the grass, but the foliage must not be mown off until it has quite died down.

E. *Single Incomparabilis, &c.*—Sir Watkin (fig. 15), Gloria Mundi, Nelsoni aurantius, Duchess of Westminster, Barrii conspicuus, C. J. Backhouse, Princess Mary, Catherine Spurrell, Cynosure, Maurice Vilmorin, Minnie Hume, Flora Wilson, Nelsoni major, Gem, Sensation, Beauty, Splendens, Beatrice, Mrs. Langtry, M. M. de Graaff.

F. *Single Poeticus*, &c.—Ornatus (fig. 18), Recurvus, Poetarum, Odorus, Jonquilla. Ornatus blooms three weeks before Recurvus, and Poetarum comes in about midway between them.

G. *Polyanthus*.—Grand Monarque. The Polyanthus section are mostly used for greenhouse culture; but, just as almost all the other sections previously mentioned will bloom very fairly well indoors, so in the South of England will many of the Polyanthus Daffodils bloom very fairly well out-of-doors. Grand Monarque does magnificently in my own garden in Surrey, but, speaking generally, all the other classes (A to F) should be tried before the beginner turns his attention to Polyanthus Daffodils (fig. 19) out-of-doors.

W. WILKS.

DAFFODIL CONFERENCE, APRIL 15, 16, 17, and 18, 1890.

The following awards were made by the Council for groups of Daffodils:—

A Gold Medal to Messrs. Barr & Son.

A Silver Gilt Flora Medal to Mr. James Walker.

A Silver Flora Medal to Messrs. James Veitch & Sons.

A Silver Banksian Medal to Mr. W. J. Poupert.

The prizes were awarded by the judges as follows:—

Silver Cup for the best collection, to the Rev. W. Wilks.

Silver Flora Medal for the best 50 varieties, to C. W. Cowan,
Esq.

Silver Banksian Medal for best 25 varieties, to C. W. Cowan,
Esq.

PRIMROSES AND THEIR CULTIVATION IN THE OPEN AIR.

By Rev. C. WOLLEY-DOD, M.A., F.R.H.S.

[Read April 22, 1890.]

THE subject of Primroses and their cultivation was nearly exhausted at the Conference of 1886. The foremost place was then given to the history of the Auricula; it is easier to discuss particular species than to speak collectively of the whole genus. Some things, however, hold true of all of them:—

1. The seed comes up best when sown as soon as ripe. The longer it is kept the slower it germinates; sometimes it takes a whole year or more.

2. All like shelter; none do well on a very exposed surface, though some like a sunny aspect.

3. All hate drought in summer. I know none which do well on a dry, sandy soil.

4. They thrive best when the roots begin as nearly as possible to the base of the leaves, and the rootstock is reduced to the least possible quantity.

The importance to cultivators of noticing the formation of the root in each species was fully pointed out by Dr. Masters at the Conference four years ago; and their habit, both above and below ground, varies very much. Between such kinds as *P. farinosa*, which contracts itself in winter into a compact bud of leaves, no larger than an acorn, the roots all dying away, or just enough being left to anchor the bud to its place, and the rootstock being reduced to a shallow cone inside the base of the leaves—between this habit and that of the Californian *P. suffrutescens*, which branches above ground from a thin stem, after the manner of a miniature shrub, there is every gradation of difference, which must be taken into account in the mode of propagation and cultivation.

For general purposes of garden ornament the common English Primrose, in its single and double coloured varieties, and its Polyanthus forms and hybrids, is worth all others together. In strong soils it is necessary to pull the plants of these to pieces, and to remove all the old roots at least every other year, as they form such thick masses of hard rootstock,

and multiply their shoots so rapidly as entirely to exhaust their growth. The old roots cannot feed the young shoots through the thick rootstock, and the young roots, which each shoot forms below it, cannot get down to the soil. It is generally thought less trouble to renew the plants from seed, except in the case of double or very choice kinds; but every gardener deals with this class in his own way, so no more need be said of them.

P. farinosa is a type representing a large class of Primroses to be treated alike. In their native home the winter buds of these often lie loose on the surface of the ground, or are held to their place by the fine grass amongst which they generally grow. Our first impulse in planting these buds is to bury them like bulbs, but if this is done they invariably die. They must be planted on the surface, not more than half in the soil. If we pull off and plant a crown of *P. acaulis*, burying it some inches, with only the tops of the leaves above the soil, a stem like a compound leaf-stalk rises from the centre, spreading into leaves and making a new crown when it reaches the surface. The rootstock of such Primroses has a power of prolonging itself indefinitely upwards, though, as I noticed before, such prolongation is bad for the plant. But Primroses of the class of *P. farinosa* have no such power, or it is so limited as to be practically none; so they must never be buried in planting. The multiplication of *P. farinosa*, by small buds forming round the base of the leaves, is very rapid. I have known one crown develop from thirty to forty after flowering; these very soon detach themselves entirely from the parent, but it requires very favourable conditions to enable them to root and establish themselves, so that practically such Primroses as these become biennial, and have to be renewed by seed.

In my garden, when May and June are wet, a fungus like wheat smut, called *Urocystis primulina*, destroys many of the seed-heads. I conclude that this fungus is indigenous, as all my stock of *P. farinosa* were collected in England; and though I grow many kinds of Primrose near, I have never seen a trace of smut on any of the others.

Something must be said about European alpine Primroses, those belonging to groups three and four of Mr. Baker's arrangement in the report of the Primula Conference. These are more

commonly cultivated in frames than in the open soil, and to do well on ordinary level borders they require favourable conditions not often found. Perfect drainage and moisture through summer are necessary to them. They like the shelter of stones to grow amongst and to spread their roots on; most of them succeed in fine *débris* of rock, mixed with a small proportion of loam. They delight in a steep slope, facing south or east, and to grow from under an overhanging stone; and where moisture does not fail, they like sun. In such situations *P. calycina*, *P. Clusiana*, *P. auricula*, *P. intermedia*, and such like grow into large plants of a dozen or a score of tufts without becoming long-necked and leggy. But the best of all for rockery decoration are *P. marginata* (Curtis), a beautiful plant at all times, with a bright silvery edging of meal on its leaves, and the white-flowered Primrose often called *nivalis*, but probably a white hybrid of *P. viscosa*. This last produces seed freely, and the seed comes true; but many of this class produce seed sparingly in cultivation. These kinds all become long-legged and bare in time, and at last fall to pieces, but are easily propagated by cuttings of the branches, and three or four small plants generally make a better show of flower than one large plant.

To pass from Europe to North America, the new world is not rich in Primroses, but three may be noticed as good: *P. suffrutescens*, mentioned already as the extreme of shrubby growth, is neat and pretty, but wants a warm situation. *P. Rusbyi*, from the mountains of Mexico, is very distinct, and flowers for two or three months through summer, but it is scarce and not very robust. *P. Parryi* does well on a raised peat-bed facing east; it lasts for several years without being divided, and is very showy and of excellent habit, seeding freely and coming up readily.

The Primroses of the Caucasus and Central Asia are not of great value to the gardener. *P. nivalis* of Pallas, as figured in Regel's "Gartenflora," is not known in cultivation in England. *P. auriculata* and *P. algida* are hardly better than *P. denticulata*, and less easily grown. *P. grandis* and *P. luteola* have less to recommend them than the wild Oxlip of Britain. Gardens can do without them.

We pass next to *P. cortusoides*, of which the best variety is known as var. *amœna*, or *Sieboldii*. The old form of this, with

large bunches of crimson flowers, growing a foot high, is very hardy, liking good loam and a sheltered, rather shady position. Its chief merit is its perfect habit of growth. It spreads by underground horizontal shoots or stolons, not more than an inch or two long, at the end of which a tuft of leaves and roots come. The stolon dies before winter, leaving a minute rooted bud ; so that a clump of this Primrose is really composed of a large number of independent plants, each at a convenient distance from its neighbour. The moderate length of the roots makes it easy to divide and transplant with a trowel, even when in flower. In the whole range of hardy herbaceous gardening I know no plant with a more accommodating habit. *Primula japonica* is a fine ornamental species ; with me it increases abundantly by self-sown seed. It is usually a short-lived plant, because left to itself it exhausts the soil beneath it, but by dividing and transplanting it may be perpetuated ; it may even be cut through the crown early in autumn, and latent buds at the sides of the plant are developed. It likes rich cultivation.

We now come to Himalayan kinds, of which I have grown from seed to flowering fifteen species or more, most of them, I regret to say, worthless for garden ornament. Some of them are not hardy. *P. Reidii*, perhaps the most elegant and beautiful of the genus, flowers and dies without ripening seed. *P. prolifera* (syn. *imperialis*) flowers with a shabby and uncomfortable look, as if it did not like the climate ; it lacks the constitution of its near ally, *P. japonica*. Several other species are too insignificant to be ornamental in gardens. *P. obtusifolia* seems one of the best, being very distinct in colour and of robust habit. It may prove the parent of important crosses, but at present none of these Indian species give much promise of potential development. *P. Stuartii*, and its variety *P. purpurea* of Royle, have not come up to expectations. The type takes at least two years to reach flowering ; it has very coarse leaves and an umbel of yellow flowers, small in proportion to the plant, and hardly compensating for the long delay of production. After flowering the thick rootstock often rots away. A second flowering is sometimes produced in autumn, but a plant seldom lives for more than two flowerings. The variety *P. purpurea* I have several times raised from imported seed ; its development is slow, and the bunch of flowers generally small, though the colour

—rich imperial purple—is good. About four years ago I had a grand specimen of this plant on a raised bed in ordinary garden soil; it bore two umbels of thirty or forty flowers each in April, and again in September. A portrait of the autumn flowering was taken by Miss North and engraved for the *Garden*. Though I have done my best to imitate the conditions, I have never produced anything like this again.

As for other Himalayan Primroses, I can add but little to what I said four years ago, as recorded on page 260 of the Report of the Primula Conference. It is desirable to retard the flowering of *P. denticulata* and its varieties, in order that it may be postponed until the conditions of our English climate give it a better chance than it has if it tries to flower at Christmas. I have discovered no better plan than cutting up the large crowns in August, as before recommended. By exercising selection, having regard both to colour and to habit, the varieties of this species are capable of improvement. If by crossing we could improve the colour and size of the flower, and retain the great vigour of constitution, this plant might have a future before it—a cross I made with *P. rosea* was fit only for the rubbish heap. As an instance of the prolific habit of the species, I may mention that one which accidentally lost its head about two inches below the surface produced the following spring about twenty shoots from the neck of each main root. These appeared like a ring of seedlings, about 200 in number, each attached to the old roots by a thin rootstock like thread; some of them which I tried for experiment made good flowering plants by autumn. This mode of multiplication may be utilised by studying the required conditions. Closely allied species or varieties are in cultivation under the names *P. Fortunei*, *P. cashmeriana*, *P. erosa*, &c.

P. rosea has a thickly tangled mass of fibrous roots, showing that it requires a finely pulverised soil. The easiest way of dealing with it is to make colonies during summer—any time between the ripening of the seed and the end of August—by pulling a plant to pieces, breaking off all the old root, and planting the shoots singly wherever the soil is suitable. They must, of course, be frequently watered till established, and no colony must be expected to do well for more than two years—renewal every year is better. But seedlings from well-selected seed are more satisfactory still. No successful hybrid has yet

been made with *P. rosea*; if its bright colour could be given to a larger and more vigorous flower it would be a gain to horticulture. *P. sikkimensis* has roots very like those of *P. rosea*, but the habit above ground is very different. I am obliged to keep it entirely in the shade, where it grows in moist peat nearly a yard high, with large heads of flowers. It soon exhausts the soil beneath it, but may be divided by separating the compact crowns in early spring, and transplanting them to new soil. It is easier, however, to raise it from seed, which it ripens in abundance. It shows no tendency to develop improvement in gardens. It may be mentioned that this Primrose has been made in some nurseries to do duty for *P. reticulata*, a plant more slender and smaller in all its dimensions, and worthless for garden decoration.

In all these Primroses the seed, if sown as soon as ripe—say about the end of July—generally comes up in a few days, and by the end of autumn sufficient growth has been made for a winter bud to be formed, the developed leaves always dying; but *P. capitata*, which I shall now describe, never under any conditions of cultivation forms a winter bud, and I do not know how it survives winter in its own home. Its merits are too great for it to be disregarded as a garden plant, but it is the most capricious and full of irregularities of all the Primroses I grow. Sir J. Hooker, in his “Flora of British India,” says that he retains this species as distinct from *P. denticulata* with great hesitation—no doubt regarding their botanical characters; but their habit in cultivation differs widely, the one being the most perverse, the other the easiest to manage of all the genus. The seed I always sow as soon as ripe, but as it remains evergreen it must be carefully sheltered all winter. The first flowering is late in summer, when the seedlings are a little more than a year old. They must be kept under glass again during their second winter, and may be planted out in May when the soil is wet. In a hot dry summer a large proportion wither and die, but when July is wet the plants thrive and flower on until the flowers are killed by hard frost. November often finds five or six fine heads on each, but it is difficult, even by covering them, to keep them through a third winter. They continue open in the crown and short in the neck, and before the end of winter the crown comes off like an acorn out of its cup, and the rootstock never breaks again. With all its faults *P. capitata* is a very ornamental and striking plant in late summer and autumn.

THE AURICULA AS A TOWN OR SMALL VILLA PLANT.

By Mr. J. E. HENWOOD.

[Read April 22, 1890.]

THE past history of the Auricula is so intimately associated with town life, that even had we not the experience of the present time to guide us in forming a conclusion, we have ample testimony that in the Auricula we have a flower possessing all the necessary qualifications to be classed as a plant especially suitable for town or villa gardens. As is only too well known, the dwellings in towns and the small villa residences of the suburbs have but a small space of ground attached to them, a mere apology for a garden. How to cultivate this small space to the best advantage, and to grow only those things that will render it most attractive, is naturally the desire of every lover of floriculture. We want for these gardens subjects requiring but small space, that are perfectly hardy, attractive, and interesting at all seasons of the year. Now we claim for the Auricula that it answers to all these conditions and requirements in a manner possessed by no other flower.

Some fourteen or fifteen years ago I was invited into the garden of a friend living in one of the main roads of Reading to view his Auriculas. Up till this time I had never heard of, much less seen, the flower, and so struck with astonishment was I at the marvellous beauty and unique appearance both of the plant and bloom that my love for the Auricula dates from that very hour. In course of time this friend became my next-door neighbour. To listen to his Auricula lore, to note his enthusiasm, and to watch the loving tender care bestowed upon his plants, kindled in me a similar fire of love that nothing in this life can extinguish. I do not wish to be egotistical, but I do desire to kindle in the breasts of some who may be listening to me that same love and admiration for the Auricula possessed by myself. I do wish to dissipate that erroneous impression that is stalking abroad that the flower is difficult of management. I do not hesitate to say there is not a flower grown that so readily responds to loving care and proper attention as the Auricula, and I must also say there is no flower known that so soon resents neglect. Under neglect it soon wears a woe-begotten, "you don't

care for me" appearance. Its beautiful green leaves are soon overrun with the dirty green-fly, and its coat of snowy whiteness becomes covered with filth. And yet under these conditions it is marvellously tenacious of life. I have seen a plant literally covered with this pest of the garden, after being freed from its enemy and made clean and tidy, start again into active growth in a surprising manner, thereby not only demonstrating its vitality, but also its gratitude for proper care and attention. I have seen plants in most luxuriant health and vigour both in frames and greenhouses, in pent-up gardens of but a few square yards, and surrounded with bricks and mortar. I have seen plants in pots, standing down the sides of garden paths. I have seen plants standing upon boxes in odd corners of the garden. I have seen them on window-ledges, and even under these conditions in health and vigour; and I know of a collection of Alpines that were repotted last autumn and left in the open, exposed to all weathers until about six weeks ago, when they were taken into a spare room having a large window facing south. I need hardly say the bloom has not been satisfactory, but the loss of plants was almost *nil*. Another gentleman that I know, having neither frame nor greenhouse, and thinking the plants required some kind of protection during the winter months, placed upwards of a hundred plants in a coal-house last autumn, and there they remained until about six weeks since. Finding that the plants had but little inclination to start into growth, he came to me for advice. In reply to my questions, he said as the coal-house had a window he thought that gave sufficient light. The plants were standing upon shelves, but were covered with dust, and were very small, but only two died during the winter. The plants were taken out of the coal-house and placed in the most sheltered portion of the garden, and the owner assures me he has derived much real pleasure from the bloom, even under such mistaken treatment as this. I mention these two cases to illustrate the extreme hardiness of the plant.

A well-known grower and exhibitor from Reading is so cramped for room in his small garden that his frames are not only shaded but quite overhung with trees, and as a consequence his plants are somewhat drawn, but still he can manage to carry off some of the best prizes at our annual shows. In contrast to this another Reading man, who in 1888 exhibited for the first

time and won fourteen out of a possible sixteen prizes, cultivates his plants in a garden situated between two rows of houses running from east to west, totally devoid of vegetation or natural shading in any form, and fully exposed to all the fury and withering influence of the cold easterly winds. Our own small strip of a garden is also much exposed to the north-east and devoid of shade, but our great enemy is the smoke from the town, which is constantly pouring down showers of black smuts; this and the dust we find a great nuisance to contend with, but with these drawbacks we manage to grow the *Auricula* fairly well.

Travelling from Reading to Birmingham and neighbourhood, we here again find the flower cultivated most successfully under most adverse surroundings. The dense mass of smoke and poisonous acids emitted from the countless number of smoke-shafts does not prevent the Birmingham florists from producing splendid specimens of the *Auricula*. Mr. Bullock, of Stourbridge, near Birmingham, a well-known florist and successful grower of the *Auricula*, grew his plants, not in a garden, but on the house-top; and even here, with the air filled with poisonous gases from the chemical works and busy manufactories of the district, the *Auricula* grew and flourished where the trees stood leafless, standing skeletons of what should have been verdant vegetation. The last town garden to describe, but the first in the heart of every true lover of the *Auricula*, is that of the well-known and greatly respected florist Mr. Ben. Simonite, of Sheffield. This celebrated garden is situated on the east side of the town, where the dense mass of smoke constantly overshadows and blackens everything, on a bleak hillside sloping northwards and overlooking what was once the beautiful valley of the Don with its market gardens and fruit orchards, then in the fulness and wealth of natural beauty, but now covered with factories and workshops noted for the production of armour-plates, large guns, &c., and within a quarter of a mile of the coal-pits. Our friend grows his plants in a span-roofed house with ventilators on all sides; here they remain all the year round, and are never placed out in the open, and consequently never get the benefit of any gentle showers in the summer months, as the Sheffield rains, being heavily impregnated with poisonous acids, would be positively injurious to the health of the plants.

Mr. Simonite, through no fault of his own or his plants,

can seldom exhibit in his best form. His plants bloom too late for the shows, in consequence of an almost total absence of sun ; but they are models of excellent culture, and I can bear personal testimony to their wonderful health and vigour. Indeed, so good a judge as Mr. James Douglas, in writing to me after one of his visits to this garden, said, " Had Ben but a climate he would beat creation."

I think I have now given ample evidence in support of my assertion that the Auricula is perfectly hardy and well adapted for town gardens. On the question of space you have sufficient proof in the plants before you. An ordinary garden-frame, 6 feet by 3 feet, will accommodate ninety-eight full-grown specimen plants, 5 square inches being sufficient space for the finest plants grown. As most Auricula-frames are placed against a wall or some other kind of fence, it is very desirable not to have them more than 3 feet in width, so that the back row of plants may be reached with ease. The length of the frame can be determined according to the size of the collection of plants. My idea of a model frame is one 3 feet wide (inside measurement), 3 feet deep at back, and 2 feet deep in front, and any length required. The centre board in front to be hung upon hinges, and fastened at top with a button. By this means air can be admitted underneath the plants when required. The staging for the plants to be made of wood 2 inches wide and 1 inch thick, and in seven tiers, two pieces of wood to be placed on each tier and a space of 1 inch to be left between the two pieces to prevent water lodging underneath the pots. The frames should be made of good yellow deal $1\frac{1}{2}$ -inch thick, painted outside a dark stone colour, and a light stone colour inside. The lights to be 3 feet square and made of 2-inch stuff, and glazed with 21 oz. glass in six pieces, so as to have but one lap, and thus avoid drip. Frames of the dimensions given are not necessary for the plants themselves, but for the comfort of the cultivator. With such frames but little stooping is required and back-aching is reduced to a minimum ; and under such conditions plants will be sure to meet with better treatment.

I have sometimes been asked : " Is a greenhouse necessary for the successful cultivation of the Auricula ? " My reply is, No, certainly not. Auriculas can be grown to a high degree of excellence in cold frames, but a greenhouse is a luxury to the

cultivator himself. Here he can attend to his plants at all seasons, let the weather be what it may—hence the advantage of a house.

An Auricula-house need neither be costly nor large. One, 9 feet wide and 15 feet long, will give ample space for 400 plants to bloom in, and will hold many more when not in bloom. This number of plants, if of the best sorts only, should be quite sufficient to compete with at all the best shows in the kingdom. My Auricula-house is 13 feet long and 9 feet wide, and ventilated at the top of the roof with wooden shutters about a foot wide and running the whole length of the house, also ventilated on both sides with shutters near the ground, so that fresh air is freely admitted underneath the staging. The staging is made flat and covered with fluted corrugated iron, upon which is laid about 2 inches of shingle. The house is fitted with a No. 1 Loughborough boiler and two rows of 4-inch pipes, so that frost can be excluded when necessary. I find this kind of a house suits the plants very well.

The feast of bloom before us to-day, both of Show and Alpines, cannot fail to call forth the admiration of all who have looked upon them, whether out of curiosity or genuine love for the flower; therefore I need not dwell upon the delicate markings or lovely tints of the Show, or the beautiful shades of colour to be found in the Alpines. The foliage of the plants differs so much that most florists can generally name their collection from the leaves alone; with some varieties it is a deep rich green, while with others a beautiful silvery streak runs along the whole edge of the leaves, and again in others the meal is laid on so heavily as to form a lovely white coating so delicate in texture that if an insect but settle upon it the footprints of the trespasser are plainly visible. Although it has so many points of delicate beauty, the plant is of a very hardy nature. Frost seldom injures it, although it will sometimes cripple the bloom from an exhibition point of view. It has but few diseases to battle with. Canker sometimes attacks the tap-root; but, if discovered in time, and the rotten part cut away, and powdered charcoal as a dressing applied to the wound, the plant generally recovers. Damp during the late autumn and winter months is its most deadly enemy, and this should be carefully guarded against. Should there be drip in the frames attend to it at once, and be careful that no

water lodges in the heart of the plant. Give them plenty of air at all times, and losses will be few and far between.

Soon as ever a green-fly shows itself kill it at once, and thus prevent thousands soon following, and don't forget that this dirty pest not only spoils the appearance of the plant, but also feeds upon it. The best remedy against the beast is a little patience, and a soft-haired brush; with a small brush and determined application a plant is soon cleaned. I am satisfied soft-soap and all other nostrums are positively injurious to the plant, and my advice is, Don't use them.

There is also another little wretch that lives and thrives upon the roots of the plant, called the woolly aphid. This silvery-coated gentleman is difficult to get rid of. At repotting time, when I come across it, I shake all the soil from the plants and well wash the roots, and thus for a time the plants are tolerably free from it. Should it congregate around the neck of the plant at any time, remove a little soil and dislodge it with a small brush. Time was when growers were greatly alarmed at it, but time has proved that it is not so destructive as was at first apprehended, and very few collections are now free from it.

The most essential thing towards the successful cultivation of the flower is a proper compost, and without it it is not to be expected that the plant can be grown to any degree of excellence.

This should consist of two-thirds good fat fibrous loam, and one-third rotten leaves and well-decayed horse manure; add to this sufficient coarse sand, or granulated charcoal, to make the whole porous when pressed into the pots. This simple compost will keep the plant in health and vigour. Avoid artificial manures and stimulants of all kinds, or else, like the drunken man, the plants will go soft. Next in importance to the soil is the size of the pots, and here so many make the fatal error of having them much too large; a pot $4\frac{1}{2}$ inches across is large enough for the most vigorous plant, and many will thrive better in pots from 3 to 4 inches in diameter. No hard-and-fast rule can here be laid down; use pots according to the size and vigour of the variety.

Watering is at all times a most important feature in *Auricula* culture; never let them get dust dry, and never keep them soddened. Both are great evils. Try and hit the happy medium.

There are but few secrets worth knowing in *Auricula* culture, and here they are :

A sweet, wholesome compost, perfect cleanliness, and proper attention to watering.

Give them these, and success is assured.

REPORT ON THE VARIETIES OF IVIES IN THE SOCIETY'S GARDEN AT CHISWICK.

By Mr. SHIRLEY HIBBERD, F.R.H.S.

A COLLECTION of varieties of Ivies has been formed in the Society's Garden by contributions from various sources, and the Floral Committee have inspected them and awarded marks of merit to such as were deemed of special value for cultivation by reason of their distinctiveness and beauty. Having collected and cultivated garden Ivies, and treated at length upon their characters and classification in a work entitled "The Ivy," published in London 1872, a desire was expressed that I would arrange the Society's collection in accordance with my own classification and nomenclature, and present the results in a report to the Council. It is with pleasure I comply with the request, having assisted in the official inspection, and having contributed from my own collection some varieties that appeared to be needful to the proper representation of the subject in the Society's Garden. The varieties added by me to the Society's collection are not included in the report, as, at the time of writing, they have not been planted out, and it might prove an imprudent interference with the work of the Floral Committee to make any further reference to them until they have made some growth and have been duly reviewed, and their relative merits officially marked for the guidance of persons interested.

The classification adopted in this report is the same as in the work above referred to,* which has been generally accepted as sufficient both for the indication of affinities and to make an end of the confusion arising out of the uncertain nomenclature and multiplied synonyms hitherto in use. The principle kept in view has been to attach to all the more distinct varieties names indicative or suggestive of their distinctive characters; and to

* "The Ivy: a Monograph, comprising the History, Uses, Characteristics, and Affinities of the Plant; and a Descriptive List of the Varieties in Cultivation." By Shirley Hibberd. London, 1872.

reduce the necessary changes to the least possible, as many of the old names have been incorporated in the new system as appeared consistent with its direct simplicity. The three reputed species of Ivies, namely, *Hedera helix*, Linn., *H. Canariensis*, Willd., and *H. Colchica*, Koch, are retained in this arrangement for convenience solely. As representing groups, the members of which are allied by obvious characters, the names are useful, and being in common use for practical purposes, it is not desirable to suppress them. But the specific distinctions they suggest are no longer recognised, for the idea of a species has of late years expanded, and it is now generally held by students of *Hedera* that there is but one species of Ivy known, the European, Asiatic, and African forms being but modifications of one and the same species. This is not the place to discuss the proofs of unity, but it may be proper to remark that in the work above alluded to I have explained that the stellate hairs that have been relied on for the determination of the three species have not the constancy of character requisite for the purpose.

The names here given are those of the garden forms. In every case the name of the species may be added at discretion, but to do so here would make a wearisome and useless repetition. Thus, the variety "Fasciata" may be labelled *Hedera helix fasciata*, although for the present purpose the last name is sufficient.

VARIETIES OF *HEDERA HELIX*.

($\times \times \times$ signifies "Meritorious in the first degree," $\times \times$ "in the second degree.")

Minor is a neat small form of *H. helix*, of frequent occurrence in woodlands. As a rockery plant it is distinguished by its close growth and the grey veins on its dark three-lobed leaves. Contributed by Mr. Turner as *H. minor*.

Minima is the smallest form of *H. helix*. The form is distinct in the prolongation of the front lobe, and in winter it often assumes a rich brown or bronzy colour. It is a miniature form of the variety here entered as *Pedata*. Contributed by Mr. Turner as *Minima*. Syn. *Taurica*, *Donarailense*, *Pennsylvanica*. $\times \times$.

Gracilis has a singularly elegant appearance. It is a minor *helix* of wiry habit with purple stems and leaf-stalks; the leaves conspicuously veined. An excellent rockery plant. Contributed by Mr. Turner as *Gracilis*. $\times \times$.

Triloba differs from *H. helix* only in being more distinctly three-lobed, while the form is more constant, *H. helix* being always variable and showing a tendency to a five-lobed outline. Contributed by Mr. Turner as *Triloba*.

Cuspidata minor is of somewhat spare habit, the leaves five-lobed, the divisions cusped, the colour light green. Contributed by Mr. Turner as *Crenata baccifera nigra*.

Palmata has a fine character, and is readily recognised by its distinct palmate form and full deep green colour. Contributed by Mr. Turner as *Palmata*. × ×.

Lobata major is of bold outline, with prominent front lobe, and a deep rich green colour. One of the best green Ivies. Contributed by Mr. Turner as *Lobata major*, also as *Scutifolia*. × × ×.

Pedata is one of the most distinct and interesting; the leaves are divided like a bird's foot, the grey veins are very distinct. Being rather spare in growth and given to objectionable variation when it has mounted to some height on a wall, it is desirable to cut it down occasionally to keep it well furnished and in proper character. Contributed by Mr. J. Fraser as *Caenwoodiana*, also by Mr. Turner as *Pedata*. Syn. *Digitata*, *Chrysocarpa*, *North Indian Golden-fruited*. × × ×.

Deltoidea has shield-shaped leaves, the lobes broad and often overlapping, the substance of the leaf leathery, the colour deep dull green, the leaf-stalks purplish. Contributed by Mr. John Fraser as *Rhomboides obovata*. Syn. *Rhomboides*, *Rhomboides latifolia*, *Rhombea*.

Lucida is a large form of *helix*, the leaf three-lobed and somewhat tapering in form, the colour rich deep green, becoming bronzy in winter, and at all seasons having a glossy surface. Contributed by Mr. Turner as *Lucida poetica*. × ×.

Tortuosa is one of the grandest of the large-leaved forms of *helix*; the leaves are broadly ovate, never distinctly lobed, though usually tending to a three-lobed form. In autumn they become twisted, and being dark green or almost black, with a polished surface, render the plant conspicuous for its massive beauty. Contributed by Mr. Fraser as *Glymii*. × × ×.

Cinerea is an Asiatic form of *helix* of rather tender constitution. It is distinct and pleasing and peculiarly interesting in growth on account of the production of the sharp side lobes subsequent to the growth of the leaf to normal size. The colour

is dull green with a shade of grey, in some circumstances giving the plant the appearance of having been dusted with ashes. In a cold climate it suffers from frost in winter, but is hardy enough for all purposes. Contributed by Mr. Fraser as *Himalaica*, and by Mr. Turner as *Himalaica*. Syn. *Chrysocarpa*, *Baccifera lutea*, *North Indian Golden*, *Cunioformis*. $\times \times \times$.

Sagittifolia is distinct and easily identified. The leaves are partly three-lobed, the centre lobe appearing to absorb the side lobes for its own augmentation; the colour deep dull green. Though distinct, it is unhandsome and uninteresting. Contributed by Mr. Turner as *Sagittifolia*. $\times \times$.

Nigra is a grand garden Ivy, distinguished by its rich deep colour and beautiful form. The leaves are distinctly three-lobed, with the front lobe larger than the others, or broadly ovate and entire, with a mere suggestion of side lobes. The colour is a deep black-green, or brownish bronze deepening to black, the veins pleasingly coloured a clear fresh green. The leaf-stalks are dull purple; the whole plant impressive by its rich deep solemn colour. It grows freely, trains itself on the driest wall, and fills in well by side-growth. One of the very best. Contributed by Mr. Turner as *Atro-purpurea*.

Conglomerata has the merit of distinctness, and though scarcely beautiful, is immensely interesting. The growth is in a somewhat geometric plan, the branches radiating regularly; the leaves are ovate, curled and frilled, and overlap so as to form a dense imbricated mass, the result, as may be seen, of a peculiar partial fasciation. The colour is a deep rich green. When trained to a wall its character is destroyed; it should be left perfectly free to spread in its own way on an open border, or on a broad shelf in the rockery. It requires a moist warm climate to ensure a full development of its interesting characters. Contributed by Mr. Fraser as *Conglomerata*. $\times \times \times$.

Fasciata is a form of *Conglomerata*, distinct enough, but not so far away as to be particularly desirable. Contributed by Mr. Maurice Young as *Minima*. $\times \times \times$.

Chrysocarpa is the yellow-berried tree Ivy, a beautiful shrub that bears fruit abundantly. Contributed by Mr. Turner as *Poetica*, and by Mr. Fraser as *Arborea flava*. It is best known in gardens as *Poetica*. $\times \times \times$.

VARIEGATED VARIETIES OF *H. HELIX*.

Marginata has the importance of a sub-generic, or at least of a sub-specific term, owing to the number of varieties that may be grouped under it, and that are separated only by trifling differences, forming a series of gradations in size, form, and colour. Under the garden name "*Marginata*" I place a variety with green stems, purplish leaf-stalks, leaves bluntly triangular, the colour dull green with a thin wash of grey; the margins white during summer; in autumn changing to a creamy hue with tints of red or purple. Only one variety in the collection agrees with my *Marginata*, and it is contributed by Mr. Fraser as *Arborescens marginata*. × × ×.

Marginata grandis has leaves broadly ovate, with bold margin of creamy variegation never tending to a tone of yellow, and with a shade of blue in the green blade of the leaf. It is a true running Ivy, although it produces occasional short spurs on which the leaves are narrowed as in fruiting Ivies, and these spurs become fruitful if allowed to remain. The growth is short and stout. The plant fills up well from the bottom, and is singularly massive and beautiful when in suitable circumstances, such as a moist shady situation may ensure. Contributed by Mr. Fraser as *Arborescens variegata*. Syn. *Marginata robusta*, *Arborescens marginata*, *Tricolor*, *Elegantissima*, *Arborescens marginata grandis*. × × ×.

Marginata major agrees generally with the last, but the variegation has a decided tinge of yellow, and it is unusual for spurs bearing narrow ovate leaves to appear, the growth being even and of running habit throughout. Contributed by Mr. Fraser as *Marginata purpurea*. Syn. *Marginata argentea*, *Marginata pulchella*, *Marginata elegantissima*, *Marginata purpurea*, *Silver Stripe*.

Marginata media comes near to *Marginata grandis*, but does not produce spurs, and is always less robust. The variegation shows no trace of yellow. Contributed by Mr. Fraser as *Marginata robusta*, and by Mr. Turner as *Elegantissima marginata rubra*. Syn. *Marginata elegantissima*, *Elegantissima marginata rubra*. × × ×.

Marginata minor includes a few forms that might with some propriety have separate names; but I have felt it better to group

them as one under a name which is applicable to them all, as the smallest of the *Marginata* series. The growth is weak and wiry, the leaves small, angular, deltoid, obscurely lobed, the central part dull green washed with grey, the margin clear cream colour, acquiring a tinge of red in autumn. Contributed by Mr. Fraser as *Aurea elegantissima*, and by Mr. Turner as *Marginata purpurea*. Syn. *Marginata argentea*, *Folius argosemens* (!), *Marginata elegans*, *Cavendishi*, *Marginata latifolia*, *Broad-leaved Silver*.

Marginata rubra agrees generally with *Marginata media*, but differs in the livelier tone of red in the margin, which is a conspicuous and beautiful feature in the early autumn. Contributed by Mr. Fraser as *Marginata elegantissima*, and Mr. Turner as *Elegantissima marginata*. Syn. *Cullisii*, *Argentea rubra*, *Latifolia elegans*, *Tricolor*, *Marginata pulchella*. $\times \times \times$.

Sulphurea has a striking character, the leaves spoon-shaped and concave, with small ear-like lobes, the variegation plentiful but dull, consisting of margins and patches of sulphur yellow and dull cream. Contributed by Mr. Fraser as *Arborescens argentea variegata*. $\times \times \times$.

Submarginata is one of the most beautiful, though it has no conspicuous feature. The leaves are of medium size, irregular spoon-shaped, with unequal lobes, the colour deep bluish green, margined with a thin line of whitish variegation, with which in autumn is associated a pleasing mixture of purplish red. One of the best for any purpose. Contributed by Mr. Fraser as *Japonica variegata*, and by Mr. Turner as *Rhomboidea obovata variegata*. Syn. *Rhombea variegata*, *Marginata major*, *Rhomboidea*, *Japonica*, *Japonica variegata*, *New Japanese*, *Scintilla argentea*, *Purpurea metallica*. $\times \times \times$.

Discolor is of neat compact habit, the leaves deltoid, with obtuse lobes, the colour dark dull green, plentifully sprinkled with white or grey dots, sometimes tinged with red; the young leaf-stalks red. Distinct and useful. Contributed by Mr. Turner as *Marmorata elegantissima*, and by Mr. Fraser as *Maculata minor*. $\times \times$.

Chrysophylla is variable and uncertain, and needs to be kept to the best possible character by propagating from the best coloured growths obtainable. It is well known as a fast-growing Ivy of robust habit; the leaves, occasionally richly coloured

deep yellow in patches or in a mottled form, justify one of its names of "Clouded Gold." Contributed by Mr. Turner as *Spectabilis aurea*, and by Mr. Fraser as *Gold-clouded*. The plant sent by Mr. Turner as *Angularia aurea* is *Chrysophylla* in one of its many forms differing but little from the type. $\times \times \times$.

Chrysophylla Palmata is a brilliant golden-leaved variety of the green-leaved *Palmata*. Contributed by Mr. Fraser as *Palmata nova aurea*. Also known in gardens as *Mrs. Pollock*, and *Palmata aurea*. $\times \times \times$.

Succinata is of small growth, wiry, neat, the leaves bluntly sagittate in form, pleasingly mottled with amber. Contributed by Mr. Turner as *Succinata*. $\times \times$.

ARBORESCENT FORMS OF HEDERA HELIX.

Aurea differs from the common Tree Ivy only in a plentiful yellow variegation. It forms a neat miniature tree of a pleasing character. Contributed by Mr. Fraser as *Arborea foliis aureis*. Syn. *Arborescens aurea maculata*.

Luteola differs from *Aurea* in having broader leaves of an irregular rhomboid form; the young leaves are yellow, but change to green as they mature. It forms a neat miniature tree. Contributed by Mr. Fraser as *Arborea flava variegata* and *Arborea aurea*. Syn. *Pumila aurea*, *Aurea spectabilis*, *Arborea aurea*.

Chrysocarpa is the Tree Ivy bearing yellow berries; a beautiful and fruitful shrub. Contributed by Mr. Turner as *Arborea flava*. $\times \times \times$.

Aureola.—The leaves are often broadly three-lobed, the colouring a pale tint of yellow, chiefly apparent on the young growth. Contributed by Mr. Turner as *Arborea aurea*.

Albo lineata is a tree form of *Submarginata*. The leaves are narrow, bright green, with a narrow margin of white. It is not showy, but makes a neat tree. Contributed by Mr. Turner as *Argentea major*, and by Mr. Fraser as *Rhombea variegata*. $\times \times \times$.

VARIETIES OF INTERMEDIATE HABIT CONNECTING HEDERA HELIX WITH HEDERA CANARIENSIS.

These appear to belong exclusively to the Channel Islands. They are of robust growth, with large leaves, usually of a full'

bright green colour, and the lobes are often in a great degree suppressed.

Major is a convenient name for a bold and vigorous form of *helix* common to the Channel Islands, where several varieties prevail, mostly intermediate in character between the *helix* of the English woods and the *Canariensis* of the more southern Atlantic islands. It is an uninteresting Ivy, though of excellent habit both as to growth and colour. Contributed by Mr. Turner as *Major*.

Smaragdina is undoubtedly the finest of the green-leaved Ivies for distinctive character, vigorous growth, and richness of colour. It approximates to the Channel Islands series; the leaves are large, three to five lobed, of a brilliant emerald-green colour. The plant trains itself closely on the driest wall, and grows freely both winter and summer. Contributed by Mr. Shirley Hibberd as *Hibberd's Emerald*. $\times \times \times$.

Angularis is a Jersey Ivy, with large leaves, angular in form, and of a light green colour. Contributed by Mr. Turner as *Angularis*.

Contracta approximates to *Sagittæfolia*, the side lobes deltoid and the front lobe wedge-shaped. Contributed by Mr. Turner as *Contracta*.

Intermedia is a convenient name for a Jersey Ivy that approaches a five-angled form, in colour and general appearance very near to the true *Canariensis*, but is of a lighter shade of colour, and in other respects distinct. Contributed by Mr. Turner as *Emeritis grandis*.

VARIETIES OF HEDERA CANARIENSIS.

Viridis may be described as a giant form of *Canariensis*, although it is distinct in outline and colour; and one of the most cheerful of Ivies. The leaves have three cusped lobes, or are without lobes; very broad in proportion to length, the colour light grass-green. Contributed by Mr. Turner as *Gigantea*. Well known as *Algeriensis*. $\times \times$.

Maculata differs from the common green-leaved "Irish Ivy" in being freely splashed with grey or whitish variegation. It varies much, the best growths being richly coloured with creamy blotches, and the young stems and leaf-stalks lively purple-red.

Contributed by Mr. Fraser as *Maculata latifolia*. Syn. *Marmorata*, *Variegata*, *Latifolia*, *Maculata*. × × ×.

Pallida is the best known of the variegated Irish Ivies. The variegation consists in patches of creamy or whitish variegation, occupying often half the leaf, and occasionally extending to perfect etiolation. It is very inconstant, and the etiolated growths soon perish. When at its best it is strikingly beautiful. Contributed by Mr. Fraser as *Hibernica variegata*. Syn. *Golden-blotched*, *Aurea maculata*, *Canariensis aurea*. × × ×.

Canescens is a variegated form of the Algerian Ivy. The colouring varies from creamy white to pale ashy grey; the leaves are narrow and pinched. The plant is tender and inconstant, and of quite secondary importance in the East of England; but in Western counties it makes a free growth, and has some beauty. Contributed by Mr. Fraser as *Algeriensis variegata*.

Lacteola is a superb variety, of bold, free habit; vigorous in growth and brilliant in colouring. The leaves are smaller than any of the green-leaved forms of *H. Canariensis*, and somewhat indistinct in form. The plant derives its beauty from the abundance and purity of its creamy white variegation, in respect of which it is unique. Contributed by Mr. Fraser as *Maderensis variegata*, and as *Lee's New Silver*. It is also known as *Lee's Maderensis*. × × ×.

Hedera Colchica appears in the collection in one form only, the well-known *Rægneriana*. Contributed by Mr. Fraser. It should be labelled *Colchica*. × × ×.

Dentata, a large ovate form of *Colchica*, characterised by a few sharp marginal spines. Contributed by Mr. Fraser as *Dentata*. × × ×.

CHISWICK GARDENS.

REPORT ON POPPIES, 1889.

A LARGE and excellent collection of these were grown, and when in full flower nothing can exceed the gorgeousness of their appearance, the colours ranging from the most brilliant shades to the most delicate tints. The one great fault is the short duration of the flowering season. By good culture, growing in good soil, and giving the plants plenty of room to extend, the season may, however, be considerably prolonged.

They may be roughly divided into two classes :—

1. PAPAVER SOMNIFERUM.

This may be taken to include what are termed Carnation Poppies, Chinese Poppies, and Pæony-flowered Poppies, single and double flowered. The plants are of erect growth. Height from 2 to 3 feet. Foliage glaucous. Flowers large.

Double-flowered Forms.

1. *Chinese Dwarf* (Vilmorin).—Colours, cherry-red, flesh-colour, bright rose, pure white, rose-cherry. Very fine strain.

2. *Carnation*.—Mixed, of somewhat taller growth than the preceding.

3. *Pæony* (Barr).—Colours, black, white, and crimson, $\times \times \times$, dark lilac, scarlet with violet, bluish red and white, light scarlet and violet, $\times \times$, striped, dark red, rose and white, $\times \times \times$, white, $\times \times \times$.

4. *Danebrog*.—Brilliant scarlet; base of each petal white; prettily fringed. A fine variety.

5. *Rawson's Fringed*, $\times \times \times$.—Same as double Danebrog.

6. *Steinforth*, $\times \times \times$.—This variety is of more compact growth than the others, and remains longer in flower. Flowers very double; of a peculiar shade of rose. Desirable.

7. *Marseilles splendens*.—Colour rose or flesh-colour. Flowers large.

8. *Snowdrift*, $\times \times \times$ (Novelty Company).—Flowers large,

very double, and finely fringed ; pure white. A very fine variety ; the best white.

Single-flowered Forms.

1. *Danebrog*.—Flowers large, brilliant scarlet ; base of each petal white, and beautifully fringed. Very showy. Flowers only last about a day or so.

2. *Mephisto*, $\times \times \times$.—Brilliant scarlet, with a large black spot on each petal ; beautifully fringed like *Danebrog*.

3. *Snowdrift* (Novelty Company).—Flowers large ; very pure white, and finely fringed, like a white variety of *Danebrog*.

Single forms of the others are only too common, and are not desirable.

2. PAPAVER RHEAS.

This includes the common Field Poppy, and the several selections made from these, such as the Double French or *Ranunculus*, Japanese Pompones, the Shirley Poppies, *Umbrosum*, and Hooker's Poppy. Plants of a spreading or branching habit of growth. Leaves much divided ; irregular, hairy. Flowers of medium size, lasting but a short time, but flowering successively.

Double-flowered Forms.

1. *Double French*.—Flowers of various shades of colour, from fiery scarlet to pink and white.

2. *Ranunculus*.—Similar to Double French.

3. *Hooker's Double*.—Flowers deep scarlet ; very fine, double.

4. *Umbrosum*, $\times \times \times$.—Flowers intense scarlet, each petal having a large black spot. Very conspicuous. The double form is inferior to the single.

5. *Shirley Poppies*, $\times \times \times$.—Selected by the Rev. W. Wilks from the common Field Poppy. A great improvement on the Double French. Flowers large, semi-double ; colours varying from intense scarlet through all the various shades of pink and rose to the purest white. Altogether of the most charming and delicate character that may be seen. Require very careful selection every year to maintain the high standard of excellence.

6. *Japanese Pompones* (Novelty Company).—A coarse and inferior stock of the Double French.

Single-flowered Forms.

1. *Hooker's Single*.—See Hooker's Double.
2. *Shirley*.—See double forms.
3. *Pavonium*.—A variety of the common Field Poppy, somewhat paler in colour, and with a dark disc.
4. *Umbrosum*.—Flowers of the most intense scarlet, with a very conspicuous black spot at the base of each petal. Very showy and attractive.

NEW VARIETIES OF TOMATOES, 1889.

(For report of trials 1887–88 see page 6, Vol. XI., Journal of the Royal Horticultural Society, 1889.)

1. *Chemin* (Vilmorin et Cie.).—Fruit large, smooth, red, obovate. Vigorous grower. A free cropper. Distinct, good.
2. *Conference, The* (Royal Horticultural Society).—Fruit medium size, round, smooth, red. Very free cropper, good grower, fine quality. A good variety for outdoor culture. First-class Certificate, 1889.
3. *Dwarf Champion* (Novelty Co.).—Fruit large, round, smooth, pale crimson. Very strong dwarf habit, poor cropper.
4. *Early Red* (Carter & Co.).—Fruit large, round, somewhat flattened, smooth, deep red. A moderate cropper. Perfection type.
5. *Ficarazzi* (Damman).—Fruit small, round, smooth, red. A free cropper. Resembles Horsford's Prelude.
6. *First Little Beauty* (Oakshott & Millard).—A form of Early Dwarf Red.
7. *Lorillard* (Paul & Son).—Fruit large, smooth, deep red, somewhat flattened. A moderate cropper. Same as New Early of Carter & Co.
8. *Non Plus Ultra* (Damman).—A true form of Hackwood, Park Prolific.
9. *No. 1 O. H. Alexander*, Old Red.
10. *The Peach* (Novelty Co.).—Fruit small, round, smooth, deep crimson, covered with a peculiar peach-like bloom. Good cropper. Very distinct.
11. *Reading Hybrid* (Oakshott & Millard).—Fruit very large, corrugated, coarse, pale crimson. A good cropper. Greatly resembles the Mikado.

12. *Surpasse* (Gilbert).—Fruit large, smooth, deep red, obovate. A free grower; moderate cropper.

13. *Tom Thumb* (Damman).—A good form of Early Dwarf Red.

14. *Wiles' Prolific* (Wiles).—Fruit medium size, smooth, round, deep red. Very free bearer. A very good variety.

15. *Yellow King* (Novelty Co.).—Fruit very large, rough, pale yellow flushed with red. Moderate cropper.

REPORT ON MARIGOLDS, 1889.

AFRICAN.

Dwarf Orange (Barr) (Dippe), $\times \times \times$.—Flowers of medium size, semi-double, of a bright orange colour. Comes into flower about a fortnight before the ordinary varieties, and is valuable on that account. Height, 20 to 24 inches. Compact.

Lemon Queen (Dobbie), $\times \times \times$.—Flowers very large and double, of a pale yellow colour. Exceedingly fine strain. Height, $2\frac{1}{2}$ to 3 feet.

Lemon (Barr) (Dippe).—Flowers large and fine, pale lemon. Height, 3 feet.

Quilled Lemon (Barr).—Flowers of medium size, prettily quilled. Height, 3 feet 6 inches.

Orange (Barr) (Dippe).—Flowers dark orange, large and fine. Height, 3 feet to 3 feet 6 inches.

Prince of Orange (Dobbie), $\times \times \times$.—Flowers very large and fine. A very fine selection. Height, 2 feet 6 inches.

Quilled Orange (Barr).—Flowers semi-double, partly quilled. Pretty.

DWARF FRENCH.

Aureo-floribunda (Barr).—Flowers small, pure yellow. Height, 18 inches.

Dwarf Compact Gold-striped (Barr).—Flowers yellow; a few striped. Height, 16 inches.

Dwarf Gold-striped (Barr).—Flowers small, having a purple disc and yellow edge. Very pretty.

Miniature (Dippe).—Flowers small, quilled, dark purple. Height, 12 inches. Compact.

Miniature Brown (Barr).—Flowers mostly single, dark brown.

Miniature Orange (Barr).—Flowers mostly single, orange.

Dwarf New Golden (Barr), $\times \times \times$.—Flowers small, orange-yellow. Very pure and good. A fine selection.

Dwarf Quilled Golden-yellow (Barr).—Flowers small, compact, prettily quilled.

Dwarf Orange (Barr).—Flowers deep orange, very double.

Electric Light (Carter), $\times \times \times$.—Flowers pale lemon colour very double, and finely striped. Height, 14 inches.

Dwarf Pulchra fl. pl. (Dippe).—Flowers small, very double, bright yellow. Height, 12 inches. Compact.

Tall French Marigold (Dobbie), $\times \times \times$.—Flowers bright lemon, very double; a few striped. Height, 3 feet.

REPORT ON TEN-WEEK STOCKS, 1889.

A large collection of the different varieties of these were again grown, the seeds having been received from the two great German seed-growers, Messrs. Dippe and Otto Putz, of Quedlinburg. The various colours in each class were sent separately, but were mixed before sowing.

1. *Dwarf German* (Dippe), $\times \times \times$.—30 colours. Growth compact. Height, 14 to 18 inches. The dark purple colour, specially fine, $\times \times \times$.

2. *Extra-double Large-flowering* (Putz).—Very similar to No. 1. The yellow colour, $\times \times \times$.

3. *Large-flowering* (Dippe), $\times \times \times$.—15 colours. Flowers large, very double. Height, 20 inches. A fine strain.

4. *Giant or Tree* (Putz).—Same as No. 3.

5. *Large-flowering Pyramidal* (Dippe).—12 colours. Flowers large and fine. Height, 12 to 15 inches.

6. *Large-flowering Pyramidal Miniature* (Dippe), $\times \times \times$.—8 colours. Very compact growth. Fine full spike. Height, 12 inches.

7. *Large-flowering Globe Pyramidal* (Dippe).—12 colours. Height, 18 inches. Flowers large, fine.

8. *Large-flowering New Pyramidal* (Putz).—8 colours. Same as No. 7.

9. *Large-flowering Dwarf Pyramidal* (Putz).—10 colours. Of very compact growth. Height, 10 to 12 inches.

10. *Large-flowering Wallflower-leaved* (Putz), $\times \times \times$.—8 colours.

11. *Large-flowering Wallflower-leaved* (Dippe).—12 colours. Of dwarf, compact growth. Height, 12 to 15 inches. A very fine selection.

12. *Extra-double Dwarf* (Putz), $\times \times \times$.—12 colours. Very dwarf, with large flowers.

13. *New Perpetual Perfection* (Dippe).—3 colours. Height, 24 inches, branching. Second-rate.

14. *Newest Perpetual Perfection* (Dippe).—8 colours. Of strong robust growth. Height, 24 to 30 inches. Flowers large and fine.

15. *Dwarf Bouquet* (Dippe).—12 colours. Of dwarf, bushy habit. Flowers small. Inferior.

16. *Double Dwarf Bouquet* (Putz).—6 colours. Same as No. 15.

17. *Perpetual Dwarf* (Dippe).—6 colours. Of small compact growth. Height, 12 to 15 inches.

18. *Victoria Bouquet, red* (Dippe), $\times \times \times$.—Of very compact growth. Flowers fine deep scarlet.

19. *New Robust Rocket or Giant Bomb* (Dippe), $\times \times \times$.—10 colours. Of strong, vigorous growth, branching and producing long spikes of flower. Height, 24 to 30 inches.

REPORT ON CHINA ASTERS, 1889.

Collections of these were received from Messrs. Dippe Brothers and Otto Putz, of Quedlinburg; M. Damman, of Naples; Messrs. Barr & Son; and Messrs. Dobbie & Son, of Rothesay. A good trial of Asters having been made in 1888, and reported on in the Society's *Journal*, Vol. XI., page 15, it is not deemed necessary—the same arrangement being followed—to enter into descriptions again this season.

1. *Chrysanthemum-flowered.*

Dwarf Chrysanthemum (Dippe).—12 colours. Height, 12 inches.

Dwarf Chrysanthemum (Barr), $\times \times$.—Mixed. Height, 12 inches.

Dwarf Queen (Putz).—6 colours. Height, 12 inches.

Dwarf Queen, Large-flowered (Dippe), $\times \times \times$.—5 colours. Height, 12 inches.

Dwarf Victoria (Dippe).—12 colours. Height, 12 inches.

Victoria (Dippe).—12 colours. Height, 12 inches.

Dwarf Chrysanthemum, Extra-double (Dippe).—4 colours. Height, 14 inches.

Dwarf Chrysanthemum, Extra-double (Putz).—12 colours. Height, 14 inches.

German Victoria, Extra-double (Putz), $\times \times \times$.—12 colours. Height, 15 inches.

Victoria, Extra-double German (Putz).—8 colours. Height, 17 inches.

New Victoria (Barr & Son).—Height, 20 inches.

Chrysanthemum, Dwarf (Damman).—Height, 20 inches.

Improved Rose (Dippe), $\times \times \times$.—16 colours. Height, 22 inches.

Victoria (Damman).—Height, 20 to 24 inches.

Triumph (Putz).—Scarlet. Height, 17 inches. Very fine.

Mignonne (Putz).—White. Height, 17 inches. Pure white.

2. *Pæony-flowered.*

Dwarf German Pæony-flowered Perfection, Extra-double (Putz).—8 colours. Height, 15 inches.

Truffaut's Pæony-flowered Perfection (Putz).—12 colours. The purple specially noted. Height, 16 inches.

Dwarf Pæony-flowered Perfection (Dippe).—12 colours. Height, 18 inches.

Pæony-flowered Perfection (Dippe's Improved).—12 colours. Height, 20 inches. Flowers large and fine.

Pæony-flowered Perfection (Damman).—Height, 24 inches. Mixed, coarse.

3. *Globe Pæony-flowered.*

Pæony-flowered Globe (Dippe).—12 colours. Height, 18 inches.

New Victoria Globe, Extra-double German (Putz).—6 colours. Height, 18 inches. Late flowering.

Prince of Wales (Dippe).—4 colours. Height, 17 inches.

Pæony-flowered Globe (Putz).—8 colours. Height, 20 inches.

Mont Blanc (Dippe).—4 colours. Height, 23 inches.

4. *Emperor*.

German Emperor (Dippe).—12 colours. Height, 19 inches.

New German Emperor (Barr & Son).—Height, 14 inches.

5. *Queen of the Market*.

Queen of the Market (Dippe).—4 colours. Flowers large, open, coarse. Very early.

6. *Pyramidal Bouquet-flowered*.

Dwarf Bouquet (Dippe), $\times \times \times$.—12 colours. Height, 13 inches.

Improved Dwarf Pyramidal Bouquet (Dippe).—Height, 13 inches.

Dwarf Pyramidal (Dippe), $\times \times \times$.—12 colours. Height, 14 inches.

Dwarf Bouquet Elegantissima (Barr & Son).—Mixed. Height, 11 inches. Very poor.

Victoria Bouquet Pyramidal (Dippe).—6 colours. Height, 16 inches.

Boltze's Dwarf Bouquet, Extra-double (Putz).—12 colours. Height, 12 inches.

Pyramidal (Dippe).—20 colours. Height, 20 inches.

7. *Imbricated Pomponne*.

Imbricated Pomponne (Putz), $\times \times \times$.—8 colours. Height, 18 inches.

Grace Aster (Dippe).—8 colours. Height, 18 inches.

Imbricated Pomponne (Barr & Son).—Mixed. Height, 22 inches.

8. *Crown Pomponne*.

New Imbricated Pomponne, white centre (Putz).—6 colours. Height, 18 inches.

Pomponne Crown (Dippe).—4 colours. Height, 18 inches.

9. *Crown or Cocardeau*.

Crown (Dippe), $\times \times \times$.—6 colours. Height, 22 inches.

Dwarf Crown (Dippe), $\times \times \times$.—4 colours. Height, 16 inches.

French Cockade (Barr & Son).—Mixed. Height, 24 inches.

10. *Dwarf German.*

Best Double German Dwarf (Putz).—12 colours. Height, 10 inches. Very early flowering.

11. *Double German.*

Half-dwarf Pompone (Putz), $\times \times \times$.—6 colours. Height, 20 inches. Very compact growth, small flowers.

12. *Lilliput.*

New Lilliput, Best Double German (Putz), $\times \times \times$.—5 colours. Height, 15 inches. Very compact.

Lilliput (Dippe), $\times \times \times$.—6 colours. Height, 18 inches.

Lilliput (Damman).—Colours mixed. Height, 19 inches. Very late flowering.

Schiller (Dippe).—4 colours. Height, 18 inches. Half-quilled.

13. *Needle or Cellular.*

Victoria Needle (Putz), $\times \times \times$.—4 colours. Height, 18 inches. Compact growth. Very bright colours.

Victoria Needle (Dippe), $\times \times \times$.—10 colours. Height, 19 inches.

14. *Hedgehog or Porcupine.*

Best Double German Hedgehog (Putz), $\times \times \times$.—6 colours. Very bright. Height, 18 inches.

Hedgehog Improved (Barr & Son).—Colours mixed. Height, 22 inches. Somewhat coarse.

15. *Shakespeare.*

Shakespeare (Dippe).—10 colours. Height, 9 inches. Flowers small, quilled.

Dwarf (Dippe).—20 colours. Height, 8 inches.

16. *Quilled.*

Extra-double Quilled German (Putz).—12 colours. Height, 15 inches.

Reid's Improved Quilled (Putz).—10 colours. Height, 18 inches.

Best Double German Globular (Putz).—8 colours. Height, 18 inches. Coarse flowers and straggling growth.

Quilled (Dippe).—18 colours. Height, 18 inches. Spreading. Inferior.

Globe Quilled (Dippe).—18 colours. Height, 22 inches. Flowers large, coarse.

Improved Betteridge's (Dippe).—16 colours. Height, 26 inches. Flowers of fine form.

Betteridge's Perfection (Barr & Son).—Colours mixed. Height, 30 inches. Flowers large and moderately good.

Dobbie's Globe Quilled (Dobbie & Co.).—12 colours. Flowers large and fine.

AWARDS MADE,

On the recommendation of the Floral Committee,

TO PLANTS GROWN FOR TRIAL IN THE GARDENS AT CHISWICK DURING THE YEAR 1889.

× × × signifies "Meritorious in the first degree"; × × signifies "Meritorious in the second degree." The names of those considered to possess no particular merit are omitted from this list.

Ageratum Imperial Dwarf (Cannell).	× × ×
" Cannell's Dwarf (Cannell).	× × ×
" Countess of Stair (Cannell).	× × ×
Aster Cocardeau (Dippe).	× × ×
" Double German Hedgehog (Putz).	× × ×
" " Imbriqué Pompone (Putz).	× × ×
" " New Lilliput (Putz).	× × ×
" Dwarf Crown (Dippe).	× × ×
" " Bouquet (Dippe).	× × ×
" " Pyramidal (Dippe).	× × ×
" " Queen (Dippe), × × ×.	(Putz), × ×
" Extra Double Dwarf Chrysanthemum (Putz).	× ×
" " German Victoria (Putz).	× × ×
" Half-dwarf Pompone (Putz).	× × ×
" Improved Rose (Dippe).	× × ×
" Lilliput (Dippe).	× × ×
" Mont Blanc (Dippe).	× ×
" New Victoria (Barr).	× × ×
" Victoria (Dippe).	× ×
" " Needle (Putz, Dippe).	× × ×
Dahlia (Bedding) Yellow Pet (Turner).	× ×
" (Bouquet) Eccentric (Turner).	× × ×
" (Cactus) Professor Baldwin (Ware).	× ×
" (Single) Amos Perry (Turner), × × ×.	(Cheal), × ×
" " Cetewayo (Cheal).	× × ×
" " Chilwell Beauty (Ware).	× × ×
" " Duchess of Westminster (Ware), × ×.	(Cheal), × × ×
" " Edith (Cheal).	× × ×
" " Excelsior (Cheal).	× × ×
" " Fashion (Cheal).	× × ×
" " Florrie Fisher (Ware).	× × ×
" " Guardsman (Turner).	× ×
" " Hugo (Cheal).	× × ×
" " Kate (Ware).	× × ×
" " Lady Monckton (Cheal).	× ×
" " Magpie (Cheal).	× × ×
" " Maud Millett (Cheal).	× ×
" " Miss Gordon (Turner).	× ×
" " Miss Linaker (Cheal).	× × ×
" " Miss L. Pryor (Ware).	× × ×
" " Mr. Kennett (Turner, Cheal).	× × ×
" " Negro (Cheal).	× × ×
" " Paragon (Turner, Cheal).	× × ×
" " Primrose Queen (Turner).	× × ×
" " Queen of Singles (Cheal).	× × ×
" " Silver King (Cheal).	× × ×
" " Victory (Cheal).	× × ×

Heliotrope	Capus (Lemoine).	x x x
"	Victor Duruy (Lemoine).	x x x
"	Fleur d'Été (Lemoine).	x x x
Pelargonium (Zonal)	Charbonnier (Lemoine).	x x x
"	Copernic (Lemoine).	x x x
"	Monsieur Poirier (Lemoine).	x x x
"	Opal (Pearson).	x x x
"	Souvenir de Merod (Lemoine).	x x x
Marigold (African)	Dwarf Orange (Barr, Dippe).	x x x
"	Lemon Queen (Dobbie).	x x x
"	Prince of Orange (Dobbie).	x x x
"	(French) Dwarf New Golden (Barr).	x x x
"	Electric Light (Carter).	x x x
"	Striped (Dobbie).	x x x
Stock, Dwarf German	Ten-week (Dippe).	x x x
"	Extra Double Dwarf (Putz).	x x x
"	Large-flowering Pyramidal Miniature Ten-week (Dippe).	x x x
"	Ten-week (Dippe).	x x x
"	" Wallflower-leaved (Dippe).	x x x

HARDY ANNUALS SOWN IN THE OPEN GROUND MARCH 15, 1889.

Asperula (orientalis)	azurea setosa (Barr & Son).	x x
Mentzelia (Bartonia)	aurea (Barr & Son).	x x x
Cacalia	aurea (Barr & Son).	x x x
Calendula officinalis	superba (Barr & Son).	x x x
Calliopsis	bicolor coronata (Barr & Son).	x x x
Campanula	macrostyla (Barr & Son).	x x x
Candytuft, Dobbie's New White Spiral (Dobbie & Co.).		x x x
"	Dunnetti (Barr & Son).	x x x
"	New Carmine (Barr & Son).	x x x
"	Hybrid, mixed (Barr & Son).	x x
"	Tom Thumb (Barr & Son).	x x
Centaurea Cyanus, bright blue (Barr & Son).		x x x
"	rose (Barr & Son).	x x x
Clarkia pulchella	integripetala, strain (Barr & Son).	x x x
Dianthus sinensis	Eastern Queen (Barr & Son), x x x. (Vilmorin), x x	
Erysimum arkansanum (Barr & Son).		x x x
"	peroffskianum (Barr & Son).	x x x
Eschscholtzia crocea	alba (Barr & Son).	x x x
"	Mandarin (Barr & Son).	x x x
"	tenuifolia (Barr & Son).	x x x
Eutoca viscida (Barr & Son).		x x x
Gilia liniflora (Barr & Son).		x x x
Gypsophila elegans (Barr & Son).		x x x
Hawkweed (Crepis), yellow (Barr & Son).		x x x
Charieis heterophylla	atro-violacea (Barr & Son).	x x
Layia elegans (Barr & Son).		x x x
"	glandulosa (Barr & Son).	x x
Lavatera trimestris (Barr & Son).		x x x
"	alba (Barr & Son).	x x x
Leptosiphon roseus (Barr & Son).		x x x
Limnanthes Douglasii	grandiflora (Barr & Son).	x x x
Linaria reticulata	aurea purpurea (Barr & Son).	x x x
Linum grandiflorum	coccineum (Barr & Son).	x x
Lupinus hybridus	atro-coccineus (Barr & Son).	x x x
"	luteus (Barr & Son).	x x x
"	nanus (Barr & Son).	x x x
"	albus (Barr & Son).	x x x

Mignonette Covent Garden Favourite (Barr & Son).	x x x
Nolana atriplicifolia alba (Barr & Son).	x x x
„ „ blue, violet, and white (Barr & Son).	x x x
Papaver Danebrog (R.H.S.).	x x x
„ Double Pæony, brick-red, white (Barr & Son).	x x
„ „ „ light scarlet, violet (Barr & Son).	x x
„ „ „ rose and white (Barr & Son).	x x x
„ „ „ scarlet with violet (Barr & Son).	x x
„ „ „ white (Barr & Son).	x x x
„ „ „ white and crimson (Barr & Son).	x x x
„ Hooker's Double (Barr & Son).	x x x
„ Shirley (Rev. W. Wilks).	x x x
„ (Single) Mephisto (Barr & Son).	x x x
„ Snowdrift (Novelty Seed Company).	x x x
„ somniferum, French Steinforth (Barr & Son).	x x x
„ „ Rawson's fringed (Barr & Son).	x x x
„ umbrosum (R.H.S., Barr & Son).	x x x
Platystemon californicum (Barr & Son).	x x x
Scabiosa, Dwarf Double, mixed (Barr & Son).	x x
„ Half-dwarf Double, blood red (Vilmorin).	x x x
Silene Armeria (Barr & Son).	x x x
„ pendula, Double Pink (Barr & Son).	x x x
Sultan, Sweet, yellow (Barr & Son).	x x x
Sweet Pea Apple Blossom (Eckford).	x x
„ „ Splendour (Eckford).	x x x

AWARDS MADE

On the recommendation of the Fruit and Vegetable Committee.

CHISWICK TRIALS, 1889.

Brussels Sprouts Northaw Prize (Veitch).	x x x
„ „ Paris Market (Vilmorin).	x x x
„ „ „ „ (Oakshott & Millard).	x x
Pea Consummate (Eckford).	x x x
Raspberry Hornet (Rivers).	x x x

JOURNAL

OF THE

ROYAL HORTICULTURAL SOCIETY.

SPRING-FLOWERING TREES AND SHRUBS.

By Mr. W. GOLDRING, F.R.H.S.

[Read May 13, 1890.]

THE subject upon which I have been asked to speak to-day is of considerable importance in gardening, seeing that hardy tree and shrub growth forms the foundation of all really beautiful gardens and parks. We can hardly imagine what England would be like without the multitude of hardy ornamental trees and shrubs which we have brought from other lands to embellish our garden and park landscapes, and to mask the poverty of our native tree flora. Happily our insular climate is peculiarly suitable for the growth of the vast assemblage of exotic arborescent vegetation which we have gathered from every temperate region of the world; indeed there is probably no other country where in one garden may be grown in the open air the plants from such widely separated countries as Canada and Chili, Japan and New Zealand.

An English open-air garden, a few acres in extent, may at the present day contain a greater variety of temperate vegetation than can possibly be seen collected in a similar area in any other country, and this is why our park and garden scenery is the admiration, not to say the envy, of all foreign visitors, especially those from the mid-Continent, where the rigorous winters and hot and dry summers are inimical to the well-being of hosts of the beautiful trees and shrubs which we enjoy here, where the atmosphere is perpetually moist and the winters rarely injure even the plants of Japan and New Zealand.

One would scarcely imagine that the subject upon which I am speaking is so important, considering the little attention that is given to it at the present time. It is, in fact, one

of the departments of gardening left to look after itself, and, moreover, is one of the branches of the art in which few young gardeners are trained. No special society is devoted to ornamental arboriculture as in the case of other important classes of garden plants, and rarely do we see at exhibitions, except those held by this Society, any attempt to bring before the public the most beautiful of the older kinds of hardy flowering trees and shrubs and the many new varieties that are being continually introduced. That a really beautiful and interesting display can be made of flowering trees and shrubs alone is shown by the large and magnificent collection gathered here to-day, chiefly from our great national botanical garden at Kew, where, happily, there exists the richest collection of temperate trees and shrubs in the world, notwithstanding the fact that the soil there is not naturally well adapted for the luxuriant growth of many classes of deciduous trees and shrubs.

It cannot be said that we have made so much progress during the last half-century in the direction of trees and shrubs as we have in other branches of horticulture; indeed I am inclined to think that we have retrograded since Loudon's time, when there was far more attention paid to ornamental arboriculture than at the present day. As evidence of this we have only to turn to the richness of tree-growth in old gardens and compare it with the poverty of modern gardens. Fifty years ago owners of gardens were far more enthusiastic in the matter of planting than they are now, stimulated as they were by this Society, which at that time could boast of the finest arboretum in the world, from which was distributed, directly or indirectly, a large proportion of the magnificent trees which are now the admiration of all from Land's End to John o' Groats. But, unhappily for British horticulture, the famous arboretum at Chiswick vanished, and from that period it is not difficult to trace the decline of the public interest in tree-planting. We ought to be grateful to those early tree-planters, for have they not bequeathed to us our present enjoyment of the magnificent trees that adorn old gardens, and which time alone can produce?

The result of this neglect of flowering trees and shrubs which now prevails is reflected in gardens, for it is apparent to all who know anything of the subject that modern gardens are neither so beautiful nor so interesting as old gardens. The commonplace

aspect of more recently made gardens is in a great measure accounted for by their owners' lack of interest, and by the want of knowledge on the part of their gardeners, to whom numbers of the beautiful old flowering trees and shrubs you see around you here to-day are practically unknown. Moreover, the prevalent practice of employing nurserymen to lay out and plant gardens too often results in an insipid garden, as the temptation to plant the most easily propagated and quickly grown things is too great, and so, as a rule, only the ordinary varieties of flowering shrubs are planted instead of the newer and better sorts.

As the demand for any class of plants obviously regulates the supply, the consequence of the neglect I complain of is that it does not pay nurserymen to keep a stock of the rarer trees and shrubs that are seldom asked for, so that it is a difficult matter now to get young plants of rare trees early introduced. Some of our chief nurserymen have, however, been active in introducing new exotic trees and shrubs, and Continental nurserymen are continually adding to their lists new and improved varieties obtained by the hybridist's and raiser's skill. We get nowadays improved or florists' varieties of such things as the Lilac, Cydonia, Weigela, Hibiscus, and Mock Orange, just as in former days they commenced to raise varieties of Rhododendron and Azalea; and if only greater attention were paid to the subject in this country, and more encouragement given to nurserymen to produce novelties, I am sure that as rapid strides would be made in the improvement of flowering shrubs as has been the case during recent years with hardy herbaceous plants. Since the days of Loudon—than whom no one has done more to advance the knowledge of exotic trees—there has been an enormous addition made to the material which he wrote upon. From the far east we have obtained those beautiful Chinese and Japanese kinds that we see before us, while from California in the extreme west, and from Chili and New Zealand in the south, we have also received numbers of trees and shrubs that were quite unknown to Loudon. Our Royal Horticultural Society, through Robert Fortune, has been instrumental in adding to this treasure, while the names of Standish and Veitch in connection with Chinese, Japanese, and North and South American plants will be known as long as gardening lasts. Our national garden at Kew has always done much to enrich the country at large, while we owe not a little to

our foreign friends, particularly those of the United States, who have not only sent us of the rich flora of their great country, but have also been our intermediary in securing numerous eastern plants, a noteworthy example of which is before me, the chastely beautiful *Magnolia stellata*, or *Halleana* as it is also called.

Taking the old with the new, we have at the present day an immense resource of flowering trees and shrubs—a bewildering variety, I might say—so that the difficulty is to know how to employ it properly for the embellishment of our parks and gardens. What to plant and what to avoid is a subject of paramount importance to a landscape gardener, or to anyone who attempts to lay out and plant gardens so as to create the most tasteful effects under the ever-varying conditions of soil, climate, and situation. How to plant and how to cultivate trees and shrubs should form a prominent branch in the training of every man whose aim is to manage a garden well, be it public or private. The cultivation of trees and shrubs—that is, the proper selection, planting, renovating, pruning, and thinning—is carried out in very few even among the best private gardens in this country, the prevalent idea in the gardener's mind being that, when once planted, no tree or shrub should need further attention. But there is a great difference between cultivated trees and shrubs and those that receive no attention, as an example of which I need only recall the magnificent specimens of Coniferæ in the garden at Dropmore (which old Philip Frost used to cultivate as carefully as he did his fruit trees) and the miserable, half-starved specimens of the same trees in the neighbourhood. Again, let us imagine for the moment a Weigela, Gueder Rose, Mock Orange, or Lilac that has been properly planted in good, deep soil, annually renovated by surface dressings, pruned in a rational way, and allowed free space on all sides to develop its long, arching shoots, which every year would be wreathed with bloom. Compare such a specimen with what one generally sees in an ordinary shrubbery where the plants were at the outset planted so thickly that in two or three seasons they form a veritable jungle of choked shrubs, each trying to thrust its head above the crowd, giving no pleasure to anyone who beholds it. The typical shrubbery in an English garden is never cared for, never renovated, never pruned, until the time

comes when the drastic remedy of destroying it and replanting is applied.

To bring out to the full the beauty of flowering trees and shrubs, they must be dealt with as attentively as a good gardener deals with an orchard. Groups of shrubs, or a shrubbery, should be well considered before planting. The aim should be to create as much variety as possible, both as regards the skyline of the masses and the harmony of colour they will display when the plants assume their adult stage of growth, and this can only be done properly by those who have an intimate knowledge of the material with which they have to deal. If the shrubbery is intended for a screen, then thicker planting than otherwise is admissible; but if the intention of the groups is to display to the fullest advantage the beauty of each shrub, then ample space must be given to each, or, if planted thickly at first, timely thinning out should be done. It is advisable to plant shrubs of one species in groups of three or more, for then a fuller expression of that species can be obtained than by the ordinary, haphazard mixture, though obviously this can only be carried out in gardens of considerable extent. Lawn groups of shrubs may be composed of one or more species; but unless a shrub is of an elegant habit of growth—like a *Weigela*, for example—several kinds had better be grouped together in order to make a pleasing mass. The most successful landscape gardeners have always planted in this way, and in the neighbourhood of London one may see excellent examples at the Crystal Palace by Sir Joseph Paxton, at the Regent's Park Botanic Garden by Mr. Marnock, and in Battersea Park by Mr. Gibson, where one may see how shrubs develop themselves and form beautiful groups by thoughtful planting. In fact, the essence of tasteful landscape gardening lies in the skilful arrangement of the flowering trees and shrubs, their colours forming, so to speak, the high lights of the picture, while the evergreens and other trees form its body colour.

Without attempting to enumerate the long catalogue of beautiful flowering trees and shrubs with which one may plant a garden in England at the present day, I shall endeavour to pass in review some of the more striking kinds that are in flower now, and of which I have numerous specimens before me, or those that will come into bloom between now and midsummer, and

which might be planted in a moderate-sized garden with an adjoining park or meadow where the soil is of an ordinary loamy nature. Among the deciduous kinds, taken alphabetically, we have the Horse-chestnut, such a well-known tree that I need only allude to the double-flowering variety, which as a garden tree, seeing that the single is so abundant, is perhaps preferable. It is more showy in flower, the flower spike being more massive and whiter, lasts in beauty longer, and does not produce fruit, which in a public park or garden is a consideration. *Æsculus rubicunda*, from North America, is one of our best trees of moderate growth, the flowers being very rich in colour, the finest variety, which should always be selected if possible, being of a deep rose-pink with yellow blotches; and a new Continental variety, named Brioti, is said to surpass in depth of colour any variety that has been seen. *Æ. carnea* is similar, but inferior in point of beauty of flower. The Amelanchier, or Snowy Mespilus, is indispensable, the whole tree being a sheet of white bloom in the middle of May. If one only is planted, *A. Botryapium* should be selected. It groups well with the Almond (*Amygdalus*), a favourite with everyone, it being the first harbinger of spring among trees. The *macrocarpa* variety of the Almond has the largest flowers, and the richest in colour is the Crimson Peach, also called in nurseries the double-flowering Peach. The Almonds and Peaches should be planted so as to rise above a mass of low shrubs, and preferably with a background of evergreen, which relieves their leafless mass of flowers. Passing over the deciduous Berberises, as their autumn fruit is more remarkable than their flowers, we come to the Caraganas, a small group of Pea-flowered shrubs, of which it may be desirable to plant a representative, and *C. arborescens* should be selected, it being a tall, dense-growing bush, with bright green foliage and yellow flowers. The Cherries (*Cerasus*) are so numerous that some consideration is needed to select the best. The common double white, *C. Avium multiplex*, is such a lovely tree that every garden should contain it, as well as *C. domestica flore-pleno*. A smaller tree is *C. serrulata* or *C. Sieboldi*, a Chinese tree of very distinct growth, and crowded at this season with white double flowers. Other double Cherries of exquisite beauty are those named *C. Watereri* and *C. Juliana floribus roseis*. The Mahaleb Cherry is perhaps too common for a garden, but the weeping variety of it should

be in the most select list ; and likewise the weeping variety of the common Bird Cherry (*C. Padus*), which should always find a place in a park or ornamental meadow ; while the list of select Cherries might be extended to the North American Bird Cherries, *C. scrotina* and *virginiana*, both fine trees. The Judas tree (*Cercis Siliquastrum*), of which some fine branches are before me, is quite a neglected tree in modern gardens, yet everyone admires the quaint old trees one sees in old gardens. It has, moreover, a peculiar interest in having been one of the earliest introduced trees from Southern Europe, having been a favourite in English gardens since the time of Gerard in the latter part of the sixteenth century. There is a very pale—almost white—variety of the Judas tree, but the Chinese and Canadian species are inferior.

The Thorns (*Cratægus*) are most important flowering trees, all of small size, so that even a small garden may contain the best kinds. Of the common Thorn there are numerous kinds, a few of the best being the double scarlet (Paul's Scarlet Thorn), the double white (*multiflex*), the single scarlet (*punicea*), the pink (*carminæa*), and the weeping white (*pendula*). What in a garden can be more beautiful than a group of these Thorns on a lawn by themselves, or rising out singly from a mass of evergreen undergrowth ?

Among other species of *Cratægus* desirable to have in a choice selection would be *C. coccinea* (scarlet berries) *tanacetifolia*, *Crus-Galli* var. *pyracanthifolia*, *orientalis*, and *cordata* ; but the list might be extended to a dozen good kinds.

The Brooms (*Cytisus*) include the favourite white Spanish Broom, the common Broom with its varieties, the white, and *Andreanus*, which is shown here to-day for the first time, and is the admiration of everyone (fig. 39, p. lix.). These early Brooms are capital plants for clothing dry banks, and the group might be made to include the beautiful kinds that flower towards autumn. The *Daphne Mezereum*, flowering as it does in winter and spring, must not be excluded on any account, and a pretty group might be made by the white and dark red (*atro-rubrum*) varieties. The Deutzias, though they will not be in flower for a month, must yet be in the list, particularly the double white *D. crenata flore-pleno* and *candidissima*. *Exochorda grandiflora*, now in full beauty of bloom, has deservedly become a popular favourite

in many gardens; the profusion of its large white blossoms and its spreading and elegant growth render it an admirable isolated lawn shrub.

The Forsythias (*F. suspensa* and *F. viridissima*) are particularly valuable, as they flower in April when few other shrubs are in flower. Both have yellow flowers, and are very showy, *F. suspensa* being a slender weeping shrub suitable for isolation on lawns, or for banks or bold rockwork; the other, being erect in growth, is more suitable for the fringe of the shrubbery group.

Garrya elliptica, from California, though not showy, has a peculiar value, as it flowers in early spring, and when a good specimen is profusely hung with long green catkins is extremely graceful. It is generally planted against a wall, but is quite hardy in light soils. Among the Genistas there are some choice shrubs. *G. hispanica*, the yellow Spanish Gorse, is one of the best, being something like the common Furze, but dwarfer, and forms a neat round bush, which in early spring glows with bright yellow bloom. As rock shrubs, *G. tinctoria* and its varieties and *G. sagittalis* are desirable; and in late summer the tall Etna Broom (*G. atnensis*) and *G. virgata* are highly attractive, and may be grown well on the poorest soils.

The Snowdrop tree is not one to recommend for every garden, but where it succeeds is a beautiful small tree, being in June hung thickly with tiny white wax-like bells. The commoner species, also called the Silver Bell tree, is *Halesia tetraptera*, and is preferable to the others, *H. diptera* and *parviflora*.

The Sun Rosos (*Helianthemum*), though generally grown in the rock garden, are well suited as an outer fringe to a shrub group planted on sloping ground, but they must have a light soil and all the sun and air possible. Besides the endless varieties of *H. vulgare* and *H. polifolium*, there is *H. formosum*, one of the most beautiful of all dwarf shrubs, its flowers being yellow with black spots.

The Jasmines include some indispensable shrubs for a small garden, but only one, the favourite *Jasminum nudiflorum*, which flowers in winter and early spring, need be mentioned in this list, and a companion for it is the old-fashioned *Kerria japonica*, which is commonly seen adorning cottage walls; but both are hardy enough to plant in open groups, and are especially suited for banks in a bold rock-garden.

The Laburnum (*L. vulgare*) is a tree so well known that I need only refer to the best varieties of it, which are all much superior to the common kind usually planted. The varieties named *Watereri*, *Parkesii*, and *Carlieri* should always be planted in preference to the ordinary kind. The selection should also include what is called the Scotch Laburnum (*L. alpinum*), a beautiful rich yellow, and with broad deep-green leaves and dense racemes, produced after all the other Laburnums are past. An interesting tree is the curious *L. Adami*, which bears yellow and purplish flower clusters on the same branch, and it may be obtained from all good nurseries.

The Magnolias are glorious spring-flowering trees, particularly the Chinese and Japanese species, which may be grown even in small gardens. No other tree or shrub can rival the beauty of the Yulan (*M. conspicua*) in full flower; the great ivory-white blossoms are so plentiful as to make the tree a leafless mass of white, twenty or thirty feet in height in fine specimens. The varieties of it are several, the finest being those named *Soulangeana*, *nigra*, *Alexandrina*, and *Norbertii*, all having large flowers, more or less tinted with purple, and were probably originated by intercrossing *M. conspicua* with *M. obovata* (*M. purpurea*), of which the splendid *M. Lenné* is a variety. Every variety of these Eastern Magnolias is worth planting, but preference should be given to those named. They are capital trees for a small lawn, as they do not grow large, but they must be planted in the open, in good soil, and not in the shade. The very early-flowering *M. stellata* or *Halleana* is a gem among small trees, being in April and early May a mass of white flowers before the leaves appear. The larger American species, *M. acuminata*, *cordata*, *tripetala*, and *auriculata*, are all handsome trees, but not so showy as the others, and do not come under the definition of select flowering trees; but a place should always be given to the deliciously fragrant *M. glauca* and its variety *Thompsoniana*, which for several weeks in summer bear large cup-shaped ivory-white blossoms.

The North American *Nuttallia cerasiformis* is a welcome shrub in early spring, bearing flowers resembling a white Flowering Currant, which shrub (*Ribes sanguineum*) of course must always be found in a good shubbery; but instead of the common kind the rich-coloured variety, *atro-rubens*, should be planted, and may be grouped with the white (*album*) variety, the yellow

(*R. aureum*), and *R. Gordonianum*, which is intermediate between *R. aureum* and *R. sanguineum*. A very pretty shrub is *R. speciosum*, so much like a red Fuchsia that it is also called *R. fuchsoides*. It is Californian, but quite hardy in light soils.

The Pears and Apples (*Pyrus*) include so many beautiful flowering trees and shrubs that it is difficult to select the best, and as these are well known, I need only mention the names of a few I should always choose. These are *P. floribunda*, one of the most beautiful of small early-flowering trees; *P. baccata*, whose showy blossoms are succeeded by bright-coloured Cherry-like fruits; *P. spectabilis*, than which there is no finer flowering tree of medium size; *P. Maulei*, a small-growing shrub with orange-vermilion flowers, succeeded by handsome Apple-like fruits; and *P. japonica*, commonly known as Cydonia, of which now there are numerous varieties, the most desirable being those named *nivalis*, white; *cardinalis*, deep crimson; *princeps*, crimson; *rosea*, rose-pink; *coccinea*, scarlet; and the beautiful variety certificated to-day under the name of *Moerloosei*. This selection would make a beautiful lawn group relieved in outline by the taller-growing *P. floribunda* or *P. baccata*.

The Robinias are beautiful flowering trees, but only *R. hispida*, the Rose Acacia, flowers early. This is a splendid small tree, with long racemes of large flowers of a rose-pink. The variety *inermis* does not differ materially from the type, and is equally beautiful. This tree should always be planted in a sheltered spot, otherwise it is liable to damage by winds. The later-flowering Robinias include the beautiful *R. viscosa*, which is one of the choicest lawn trees, and also Decaisne's variety of *R. Pseudacacia*. *Rubus deliciosus* is a shrub from the Rocky Mountains that is yet but little known, but its extreme beauty renders it one of the choicest shrubs, the flowers being large pure white, like single Roses, and produced plentifully on a graceful bush, which is perfectly hardy, and may be planted as a single specimen on a lawn.

The Shrubby Spiræas, though so numerous, have not among them many early-flowerers, the only species that are in flower now being the pretty little *S. Thunbergi* and *S. confusa*, both good dwarf shrubs; but soon these will be succeeded by a crowd of others, including *S. callosa* and varieties, *S. hypericifolia* and varieties, *S. cantoniensis* or *S. Reevesiana*, *Nobleana*, *Douglasi*,

opulifolia, and *salicifolia*, all of which should not be forgotten in a choice list.

The Lilacs (*Syringa*) include so many good sorts that it is not easy to say which is the best, but I should always plant the new highly coloured kinds in preference to the older sorts. There are none finer than Souvenir de L. Späth, Camille de Rohan, Dr. Lindley, Charles the Tenth, and the rich variety certificated to-day Mme. Kreuter, which perhaps eclipses all others in colour, while among the whites I should choose *alba grandiflora* and Marie Legraye. The double-flowered Lilacs raised by M. Lemoine are coming into favour, as they are found to last longer in bloom, and as a graceful shrub the old Persian, *S. persica*, must be comprised in a selection.

The Viburnums include the old Guelder Rose, which is seen in every garden, and a very fine shrub it is when treated liberally and allowed to spread freely on all sides. The Japanese Snow-ball-tree (*V. plicatum*) deserves to be more often planted than it is, being perfectly hardy, and at this season its long shoots are wreathed with snow-white balls of bloom.

The Weigelas comprise now a large number of sorts since raisers on the Continent have taken them in hand. Besides the beautiful *W. amabilis*, which is still one of the finest, we have a long list of varieties of *W. rosea*, a selection from which would include those named *candida* and *hortensis nivea*, both lovely white sorts; Van Houttei, Abel Carrière, Dr. Baillon, Isoline, P. Duchartre, and Stelzneri, all more or less highly coloured; while the variegated sort, *amabilis variegata*, and the golden-leaved, *Looymansii aurea*, would lend their leaf-colour to brighten the group when out of flower.

In the foregoing remarks I have been able only to touch the fringe of my subject, which is a larger one than can be dealt with in a paper of this nature. I have not even alluded to the host of beautiful shrubs that could be added to the list I have given if a garden were on a suitable soil for the growth of peat-loving shrubs, such as Rhododendrons, Azaleas, Ericas, Ledums, Clethras, Menziesias, Andromedas, Kalmias, and the like; neither have I been able to touch upon the evergreen kinds, and the many fine shrubs that flower later, and which are included in the genera Ligustrum, Hypericum, Philadelphus, Stuartia, Eucryphia, Olearia, Veronica, Hibiscus, Spartium, Indigofera,

Cistus, and others, but I hope that sufficient has been said to point out some of the material which can be employed in making an English garden attractive and interesting during the spring and early summer months.

DISCUSSION.

Mr. GEORGE NICHOLSON, in referring to the statement that many plants had disappeared from gardens since Loudon's time, said that no doubt this was true to a certain extent, but it should also be remembered that many other newly introduced plants had taken their place, and if a census were taken it would be found that a far larger total number of plants were now cultivated than in Loudon's time. Perhaps one reason why many things seemed to have been lost was because they had been so improved by cultivation as to be almost unrecognisable when compared with the original types. There are now many fine shrubs in our gardens, but, like everything else, they require careful cultivation, and should in every case receive the particular treatment that each one requires, paying attention to soil, light, air, and so on. In fact, shrubs should be treated as if they were fruit-trees, and the results would then certainly be satisfactory. Among trees worth cultivating, Mr. Nicholson mentioned the single Horse-chestnut, than which he could not find anything more beautiful. *Magnolia conspicua*, too, was a fine shrub, and by no means uncommon; there were some very large specimens of it at Kew. The Amelanchier, with its abundance of sprays of white flowers, and the common Guelder Rose (*Viburnum opulus*) are shrubs of much value, and might be cultivated more than they are with advantage.

Sir JOHN LLEWELLYN, Bart. (who was absent during most of Mr. Goldring's lecture) said he was not aware, owing to his absence if Mr. Goldring had touched on that branch of the subject which included Azaleas and Rhododendrons. He said he was sure that most people were unaware of the hardiness in this country of many Indian species of these plants. They were considered too difficult to grow, but he said some of them were hardy enough for the most part in the English climate. The chief attention, however, should be paid to the soil in which they grew, as the presence or absence of lime affects these particular plants very much.

Among the best kinds of Rhododendrons to be planted out, Sir John mentioned that *R. Thomsoni*, *R. barbatum*, *R. campanulatum*, and a few others would be sure to give great satisfaction. As to Azaleas, he predicted that a great future was before them. *Azalea pontica* was introduced in the last century, and he thought that if seedlings were raised a great variety of forms would be created. American Azaleas existed in great variety, and are so good as to require very little, if any, improvement. *Azalea mollis*, a native of Japan, has not been so good for crossing as *A. pontica*, but the strain might be improved. Some years ago Mr. Waterer sent out some hardy hybrid Azaleas, into the flowers of which much colouring was infused. On the whole, Azaleas—of course, not Indian Azaleas, which require to be grown only in very favoured positions out of doors—hold a very high place among spring-flowering plants, and he recommended, in conclusion, that the hardiest species of every class of plants should be tried out of doors, and if this were done we should have great power in extending the beauty of our gardens.

Mr. GOLDRING, in reply to Mr. Nicholson, said that he did not mean to say we had gone backward in the introduction of trees and shrubs since Loudon's time, but that there was a great contrast between the plants grown thirty or forty years ago and those now generally cultivated. This was owing largely to fashion—for there is a fashion in gardening as in other things. At one time the craze was for planting trees and shrubs, but now the fashion runs in another direction. He did not mean to disparage the single Horse-chestnut, but simply mentioned the double Horse-chestnut for planting, so that his garden might be different from that of other people. As to the Japanese Snowball-tree (*Viburnum plicatum*), it sometimes gets frostbitten, though it is perfectly hardy, and he believed it was one of the best shrubs for planting. In answer to Sir John Llewellyn, he said he would have spoken more about Azaleas and Rhododendrons, but if he once began to talk about one particular species, he would have felt inclined to go on talking of several.

HERBACEOUS PÆONIES.

By Mr. GEORGE PAUL, F.R.H.S.

[Read June 10, 1890.]

THE Pæony, cultivated as a double flower in many varieties, is a modern introduction—so modern that we are in time, by taxing the memory of men living who have seen the rise of the plant as a florist's flower, to secure its correct history. I apprehend the Journal of the Royal Horticultural Society cannot be better employed than in registering the horticultural progress of any gardening flower, and so I have endeavoured, in the short paper I am about to read, to obtain this record. Mr. Lynch will treat of the various species of Pæonies, and you will learn that, in his opinion as a practised botanist, the garden varieties spring from a few species only. From careful observation of varieties, he appears to me to be quite correct in assuming them mostly to be sprung from *P. albiflora* and *P. officinalis*; some few from *P. peregrina*; and two or three from *P. tenuifolia*; but we have to add to these, as the originals of our garden varieties, the two double forms imported from China as *P. Reevesi* and *P. Pottsi*, which probably gave rise to their name of Chinese Pæonies, "hybrids of *sinensis*" as they are called in Verdier's list—the Anemone-flowered varieties seeming to appear in both the *officinalis* and *paradoxa* offspring.

The double forms therefore existing when the florists took them in hand were the three forms of *officinalis*, *rubra*, *rosea*, and *carnescens plena*; *anemonæflora plena*, *Reevesi*, *Pottsi*, and *tenuifolia plena*. The older writers mention few: Gerard in 1598, the double white and double red, and a single red and white variety, and he adds "all sorts of Pæonies do grow in our London gardens." Parkinson mentions two double forms in the "Paradisus" in 1656—the double red as very common and the double blush. Miller's dictionary gives two double red and "the greater Pæony with a double whitish flower," probably our *carnescens*. In Hales' "Eden," 1773, one, the great double red Pæony, is described. Kew, from the "Hortus Kewensis" of 1789, possessed only two kinds, *officinalis* and *tenuifolia*; whilst Abercromby in 1786, and Mackintosh in 1823, neither of them mentions Pæonies as garden flowers. My own firm's number book of about 1850

has only the double forms I mentioned at the beginning of this paper as forming the groundwork on which the florists worked.

With these data, finding it was about 1840 that the sale of the first raised seedlings began, I sought information from two of the English plantsmen who are still amongst us, Mr. Robert Parker and Mr. Salter. Mr. Parker's first recollection of a collection of named sorts was that of Mr. Loddige, about 1845. But the collections in his nursery were disposed of, if I recollect aright, about 1853, and I have no catalogue except a page or two used in the binding of a small volume of Scott's poems, but, unhappily, it is not the Pæony page. Mr. Parker sent me some bound copies of Salter's lists from 1855, and Mr. Salter kindly writes: "My father began to form his collection about 1850 with the species—such as *edulis (albiflora)*, *Pottsi* and *Reevesi* from Osborn's, others from the Angers nurseries, also four from Van Houtte and Van Geert in Belgium, and some few were our own seedlings raised at Hammersmith. This is all I remember about it, except that they had a large sale and we were quite unable to execute the orders for such varieties as *grandiflora nivea plena*, *lutea plenissima*, *pulchrum*, *prolifera tricolor*, &c." In the catalogues of 1855 these four sorts appear, and, as far as I have dissected the lists, some twenty other double sorts.

Of this list four sorts are in my last year's catalogue and nine in Mr. Barr's list of this spring. The names of these kinds still grown are:—

P. grandiflora nivea, *nivalis*, *anemonæflora striata*, *carnea elegans*, Duchesse d'Orléans, Reine des Français, *prolifera tricolor*, *grandiflora rosea*, *Humei alba*, and *Pottsi*.

So far the English record; but as the raisers were in the earlier days of the herbaceous Pæony mostly French or Belgian, I sought out from those distinguished florists M. Lemoine, of Nancy, and M. Keteleer, of Paris, both of whom had been growers of Pæonies from the very beginning of their culture, a record of the French raisers. I saw M. Keteleer on Saturday, and he kindly gave me all the information required, which was confirmed independently by communications from M. Lemoine.

The first raisers were M. Lemon père, of the Porte St. Denis, Paris, about 1824: his kinds were mostly obtained from *P. officinalis* syn. *sinensis*, and amongst his earliest varieties

were *grandiflora nivea*, *sinensis odorata*, and *anemonæflora alba*; and at the same date M. Jacques, gardener to King Louis Philippe at Neuilly, who began with *P. paradoxa*. One of his first was *P. fimbriata sanguinea plena*, his collection passing on to his nephew, M. Victor Verdier, of Paris, who about 1838 sent out several of the varieties. Modeste Guérin, of Paris, in 1835 made rapid strides, sending out about 1837-8 such good varieties as Modeste Guérin, Duchesse de Nemours, Mme. Furtado, and the fine dark crimsons which owed their origin to *P. Pottsi*.

“In 1840 the Prince de Salm Dyck possessed a rich collection of Pæonies,” writes M. Lemoine, “which I saw in 1842 at his establishment at Soulange Bodin, near Paris; but,” he adds, “it was only about 1845 that the fine new double varieties were sent out from the Paris establishment.” The principal and latest raiser was M. Calot, of Douai (Nord), who inherited a large collection from an amateur, the Comte de Cussy, and continued the collection and production of seedlings till 1872, when his collection passed into the hands of M. Crousse, of Nancy, whose careful selection of varieties sent out in an annual series from that date until 1879, and subsequently his own seedlings from 1882 to 1889, have brought our collections up to the high standard which the varieties composing them have now attained, Calot’s plants dominating all others, such as Mme. Calot, Jules Calot, Souv. de Gaspar Calot, Mme. Crousse, Livingstone, Félix Crousse, Modèle de Perfection, Mme. Geissler, &c.

In Belgium an amateur, M. Buyck, about 1835 produced, amongst others, *Festiva maxima*; and M. Parmentier, of Enghien, some fine dark sorts, such as Duc d’Arrenberg.

Our English raisers, beginning with Mr. Salter and ending with the fine series so splendidly and continuously shown by Messrs. Kelway, show what can be done in our climate in raising new kinds from seed. Mr. Kelway has been good enough to embody his experience in the following letter:—

June 6, 1890.

DEAR MR. PAUL,—You kindly asked me to give you an outline of my doings with the Pæony. I am afraid I have but little to tell you that may be interesting. My exhibits during the past ten years are exemplifications of my success in its hybridisation and cultivation. I happened to be at a neighbouring “wake” in 1863, and was much impressed with the blooms of various Pæonies which bedecked several

of the coats and dresses of some young men and maidens. I became inquisitive as to where they had grown, and I found the plants growing in an old woman's "flower knot," as she was wont to call her garden—a narrow strip about two feet wide between her cottage and the London high road, on the Somerton hill, over which the stage coaches used to travel from Exeter to London, and the spot which the coachmen and guards proverbially said was the coldest in the whole drive. It is worth noting that in this parish several Roman pavements have recently been uncovered, as the Pæonies *may* have been brought there by the Romans. I procured some of each of the species, and set to work in the following year hybridising. I got a plant of *corallina*, which my father's sister, an old lady of eighty-four, had found on Steep Holm, an island in the Bristol Channel. The leaves of this species are different from all others, being entire; the foliage of all others, I believe, is divided; the seeds, which remain on the seed-pods of *corallina* after the pods are open, are very ornamental, and when the sun is shining on them they look like amethysts. It so happened that the woman from whom I got my first lot of Pæonies possessed the scented variety, and from this fact I attribute my success in getting so many highly scented kinds.

I find Pæonies will grow freely in any kind of soil—peat, clay, or stone brash—but they are gross feeders, and luxuriate in deep loam with plenty of manure. I find by growing the various species, I have Pæonies in bloom from the 1st of May to the end of June. It is very pleasing to me to know that I have been the means of distributing such a hardy and decorative plant to the million, giving them such a profusion of bloom, requiring no protection from the severest weather, enduring any amount of cold, any quantity of rain, or the severest drought—filling, as the Pæony does, a great want, that of providing a quantity of flowers just before Roses may be had in abundance from the open air.

The Pæony is never attacked by any blight, game, vermin,* slug, or snail, and my connection with it has been a source of renewed pleasure from year to year. I have about five acres occupied with these noble flowers, and when in bloom they are a great sight, people coming in large numbers from far and near to see them and enjoy their perfume, which can be detected at a considerable distance. The most useful species to grow, with their varieties, are *Moutan*, *decora*, *tenuifolia*, *officinalis*, *paradoxa*, and *albiflora*.

Yours sincerely,

WM. KELWAY.

The result of the work of all these raisers may be fairly seen in the collections submitted to you in the hall to-day.

The flowers are very large; in their varied shapes they are fairly perfect; and they have nearly every colour. The lines which improvements should take are, sweeter scent; a variation of the petals of the flowers—in the one case to more even, closer petals, in the other to more varied fimbriated petalled flowers; the separation of the earlier and later series, so as to prolong the

* Slugs and the larvæ of cockchafers have been known to work much mischief.—Ed.

blooming season; and, as far as the bright reds are concerned, larger flowers, and in the rose colours more variation of colour. I have drawn up a list of the best fifty double kinds in my collection, adding amongst the single kinds the twelve best early-flowering sorts and the twelve best later ones. They are:—

50 BEST DOUBLE PÆONIES, suitable for Decoration of Garden Borders.

European Sorts, May-flowering.

1. Old Double Crimson, officinalis rubra plena.
2. " " Rose, " rosea plena.
3. " " White, " alba plena (opening rose, fading white).

Asiatic Species.

4. Tenuifolia plena (an excellent kind).

Albiflora family, June-flowering. White or tinted pink.

- | | |
|--|---|
| <ol style="list-style-type: none"> 5. Alice de Julvecourt. 6. Boule de Neige. 7. Duchesse de Nemours. 8. Festiva maxima. 9. Grandiflora nivea. 10. Mme. Calot. 11. Næmie Demay (one of the best). 12. Virgo Maria. | <ol style="list-style-type: none"> 13. Formosa alba. 14. Mme. Crousse. 15. Pulcherrima. 16. Charlemagne. 17. Alfred de Musset. 18. La Perle. 19. Mme. de Verneille. 20. Mathilde de Roseneck. |
|--|---|

Pink (and shades of). These we have found to be some of the most beautiful and exquisite in shading, scent, and form of flower.

- | | |
|---|--|
| <ol style="list-style-type: none"> 21. Artémise. 22. Faust. 23. Belle Douaisienne. 24. Globosa. 25. Jeanne d'Arc. 26. Lady Leonora Bramwell. 27. Léone. 28. Lucrèce. 29. Mme. Chaumy. 30. Modeste (Guérin). | <ol style="list-style-type: none"> 31. Rosamond. 32. Reine des Roses. 33. Charles Verdier. 34. Delicatissima. 35. Francis. 36. L'Élégante. 37. Mme. Lemoinier. 38. Modèle de Perfection. 39. Livingstone. |
|---|--|

Red or Crimson tinted.

- | | |
|--|---|
| <ol style="list-style-type: none"> 40. Berlioz. 41. Mme. Forel. 42. Trojan. | <ol style="list-style-type: none"> 43. Gloire de Douai. 44. Ambroise Verschaffelt. 45. Isabella Karlitzyk. |
|--|---|

Sulphur shades, with Pale Rose.

- | | |
|--|---|
| <ol style="list-style-type: none"> 46. Mme. Emile Galle. 47. Claude la Lorraine. 48. Triomphe de Paris. | <ol style="list-style-type: none"> 49. Solfaterre. 50. Belle Châtelaine. 51. La Fraîcheur. |
|--|---|

BEST SINGLE-FLOWERED PÆONIES (24).

May-flowering Species.

- | | |
|---|---|
| 1. Russi, rosy pink, dwarf, compact habit. | 7. Tenuifolia, bright, vivid crimson. |
| 2. Lobata (officinalis lobata = conchiflora). | 8. Triternata, very distinct in foliage. |
| 3. Peregrina. | 9. Decora elatior (from Southern Russia). |
| 4. Officinalis (single). | 10. Corallina (the English Pæony). |
| 5. Anemonæflora, golden anthers, lovely. | 11. Wittmanniana, pale sulphur. |
| 6. Arietina, very large rose. | 12. Sibirica. |

Single June-flowering Pæonies.

- | | |
|--|-----------------------------------|
| 13. Albiflora. | 18. Ella. |
| 14. Tartarica, splendid shape, white, shaded pink. | 19. Gwendoline, pink. |
| 15. Whitley,* the largest single herbaceous Pæony. | 20. Numitor, single crimson. |
| 16. Pottsi, semi-double, dark crimson. | 21. Pantius. |
| 17. Galmi, rose. | 22. Tameas, deep rose. |
| | 23. Marquis de Lory, semi-double. |
| | 24. Rubescens, white. |

Now as to growing Pæonies. They do well in any soil, only I would say, the lighter it is, the deeper the soil needs cultivating and the richer the manuring necessary. The lighter also the soil, the more copious and more frequent the waterings, for the Pæony when coming into bloom and during its flowering season needs frequent soaking. My culture on a heavy soil is this. A piece of land in good heart is chosen; the land is trenched, or bastard trenched, a heavy dressing of manure being placed just below the top spit; the ground is allowed to fallow and get somewhat weathered, when it is ready for planting. November to February is the best time for planting. A plant with one to three crowns makes eventually the finest clump. The earth should be cleaned well from the roots, so that they may be clear of all sour soil or manure, and be ready to take to the fresh soil. Plant them with the crowns about three inches below the surface, and leave undisturbed until the shoots appear in the spring, when an occasional watering and slight summer mulching will help the next year's blooms. "Art is long" in planting Pæonies. The new fleshy roots have to establish themselves, so do not expect more than a very moderate, if any, bloom the first year. A winter mulch of manure, to be forked in in the spring, will induce a few good flowers the next year, and a soaking of manure-water will increase the beauty of these few flowers; but with this treatment it is the produce of the third

* This is also known as *P. albiflora* var. *candida*.—ED.

year which amply repays all the trouble of the cultivation, and each clump in succeeding years will enlarge and become a greater source of pleasure and enjoyment in the garden. It is when four or five years old that Pæonies give the noble, long-stemmed flowers which in May and early June one sees filling vases in almost every window in the French cities, and which make a garden with only a few large clumps of Pæonies so beautiful and so attractive.

A NEW CLASSIFICATION OF THE GENUS PÆONIA.

By Mr. R. IRWIN LYNCH, F.R.H.S. ; A.L.S.

[Read June 10, 1890.]

I BEG leave to lay before the Society a new classification of the genus *Pæonia*, in which I have grouped and arranged the species according to my estimation of their true relationship. No natural arrangement exists that can be used for plants of the present day, and I believe that such an arrangement is always the most useful and convenient. There are, for instance, several plants in gardens that are incorrectly called *Russi*, and by the following arrangement it may readily be observed that they do not resemble any plant of the group in which *Russi* is placed, and consequently it may be seen, without reading a description, that the names are wrong.

This genus is found to be difficult; and though it would scarcely be possible to remove all the difficulty, I hope by means of this arrangement to make it more easily understood. It is difficult for various reasons, but more especially in gardens, because some of the types are connected by intermediate gradations, both of hybrid and probably wild origin, the history and knowledge of which have been lost. We have various forms that have not been described or figured, while the figures and descriptions that we have are often insufficient for the certain identification of the plants they represent. It is difficult as a critical genus on account of rich variation within the limits of those subordinate groups we call species, and because some

of those species, as Asa Gray would have said, are confluent in a series.

I have endeavoured to make it easy by this arrangement to refer any plant to a group of a limited number of species, and then by means of short descriptions to determine the species or botanical variety to which it must belong. I have set myself to understand the species as known to Anderson, who gave us the first good monograph, more than seventy years ago, in the twelfth volume of the *Transactions of the Linnean Society*, and as held by Baker, who gave us the second, published in the *Gardeners' Chronicle* of 1884. In that, but not including all the garden varieties to which Anderson gave botanical status, I believe I have succeeded. I carry discrimination a step further than Mr. Baker does, but I deal mainly with species according to his monograph, and, considering the nature of the plants, I think that enough for one season, as a basis, especially if I may be allowed at a future time to return to the subject.

Mr. Barr has numerous forms in his well-known collection that require prolonged attention, for the plants of this genus are such that they cannot well be understood until the eye has been educated to see clearly the points they present. We may find it necessary to make more species or varieties for some of those plants that Mr. Barr has, or for others that will be introduced. But this must be done, in most cases, after some deliberation. We have, in fact, still to make a study of this genus. It is one that can only be understood by study in the garden, and with proper means. We must have the plants of this genus got together, just as Mr. Barr has got together those of the genus *Narcissus*; indeed, from what I have seen, he already promises to do as much for it as he has done for the genus *Narcissus*. The best example we can have for its treatment is that devoted to *Iris* by Professor Foster, which is, in fact, the one method of treatment for all critical garden genera. We have, no doubt, a great deal to discover and much to learn. We must get seed and plants from all quarters where *Pæonies* are found, and then, as we get the wild plants side by side, we shall learn what the forms and variations of the genus are worth. I believe myself in the permanence of many of those forms we call slight, and I think it not amiss to ask respect for all so-called mere forms that are truly wild. They are important for study, and it is only by

chance very often that any given form, as we express it, has not been taken as a type, and revered as a centre around which other forms must group. By getting *wild* Pæonies together we may expect to understand the various forms and hybrids that we now have in gardens. Under the figure of the so-called *Pæonia Russi* in the *Botanical Magazine* of 1830, it is remarked that so many hybrids and varieties are now cultivated that it would puzzle the most acute botanist to mark the limits of the species. We have now, I dare say, a number of those plants to deal with. I do not myself believe in much difficulty if we prosecute a complete study. By following the lines I have indicated we shall learn the value of characters, we shall avoid the great difficulty that happens sometimes, of trying to distinguish botanically those plants that are essentially the same, and, on the other hand, we shall recognise the importance of differences that we may now consider slight. If Linnæus had had the complete view to which I refer, he could not, for instance, have combined *P. corallina* with *P. officinalis* in one species. It is the real knowledge of living plants that we must get, and then we may go much further in a scientific manner than is possible with dried plants. I believe the compilers of Continental Floras might pay attention to us with great advantage when we have accomplished what we propose to do.

But now as to this classification. The latest, most valuable, and complete monograph is that by Mr. Baker in the *Gardeners' Chronicle* of 1884. He uses certain characters of the carpels for the grouping of species, by which some closely related species are separated, and others not related are brought together. Now mature carpels are not always present or produced, and it appeared to me that if a new arrangement could be made upon characters generally present, and by which it would be possible to keep allied species together, so as to bring their distinguished features directly in contrast, that a study of the genus would be facilitated. In the sub-genus *Pæon*, the only one that has more than a single species, I take my divisional characters chiefly from the leaves. Flowers do not afford strong botanical characters by which to go very far. This does, I dare say, favour the view of the "Genera Plantarum," that the species (of the date of writing) might probably be reduced to four or five, and from this broad view the groups I have made would no doubt, with some exceptions,

be regarded as species. But I believe that a greater number must be admitted even from a purely botanical point of view. The leaf differences are considerable, and, though leaves do vary, it is always within defined limits and not in confusion.

In dealing with the entire genus I make three sub-genera. First of all *Moutan*, characterised by shrubby habit and a development of the disc that envelops the carpels. The carpels are enclosed, as it were, in a bottle, with the stigmas protruding at the mouth. The early condition is shown by fig. 22, and a later stage, with the bottle bursting by the swelling of the carpels, by fig. 23. Of this there is only the well-known species *P. Moutan*, cultivated in China and Japan, and known only in cultivation. The next sub-genus, *Onæpia*, is herbaceous in habit, and is characterised by fleshy or leathery petals, shorter, or at least no longer, than the sepals. An idea of its characters is given by fig. 24. It has one species, *P. Brownei*, native from nearly sea-level in California to nearly the snow-line in the Rocky Mountains. There is at least one good variety, I think, for our purpose, established by Nuttall with specific rank as *P. californica*. It has since been reduced to *Brownei*, but in such cases of reduction, when the two plants are known to the botanist who establishes the second species, we may often suspect something quite distinct for garden purposes. This differs conspicuously in the more acute ultimate segments of the leaf, as shown by fig. 25. *P. Brownei* is the only Pæony native of North America, and may be said to stand as far apart from other Pæonies in relationship as it does geographically. All other Pæonies are natives of Europe or Asia.

The remaining sub-genus I call *Pæon*, after De Candolle. It is always herbaceous, with large spreading petals, not fleshy like those of *P. Brownei*.

I come now to the groups of this sub-genus *Pæon*, of which I make five, indicated by letters A to E, and to the essential part of the work I have done. They are sufficiently explained in the following classification, and by the accompanying figures. It will be noticed that under group E, I endeavour to break up the species *P. peregrina*, as understood by Mr. Baker. He includes, or rather does not distinguish, *P. pubens*, which appears to me distinct, and he combines those plants that have the terminal lobes of the leaf trifid whenever fully developed with those that

never have the terminal lobe divided in this way. All the varieties of *peregrina* in Anderson's monograph appear to have the terminal lobe trifid, and this is splendidly shown by specimens grown at Glasnevin. Miller is the authority for the species, and he describes it "foliis difformiter lobatis, lobis incis." The last two words I understand to refer to fissuring of the lobes, as otherwise it is difficult to comprehend their application. I take, therefore, those plants which have at least the terminal lobes trifid for true *peregrina*. I admit four species which are not in the monographs to which I have referred, and having dealt only with those that are in gardens, I have omitted four not yet introduced, viz.: *P. obovata* and *P. corsica* (described by Mr. Baker in his monograph), together with *P. lutea* and *P. Delavayi*, both recent discoveries in the province of Yun-nan, of which specimens have lately been added to the Kew Herbarium. I may add that I have been unable to find any clear mark of distinction between *P. humilis* and *P. microcarpa*, and believe they will prove at least conspecific.

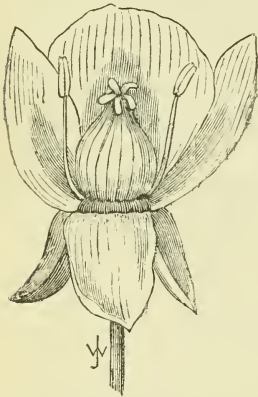


Fig. 22.

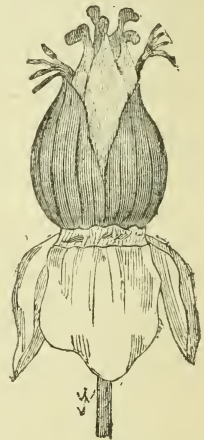


Fig. 23.

PÆONIA.

Sub-genus Moutan.

Shrubby. Disc produced enclosing the carpels. (See figs. 22 and 23.)

1. *P. Moutan*, Sims.

Sub-genus Onæpia.

Herbaceous. Petals short and leathery, scarcely exceeding the sepals. N.W. America. (See fig. 24.)



Fig. 24.

2. *P. Brownei*, Dougl., *Bot. Reg.*, vol. xxv., t. 30.—Leaflets ternately divided or pinnatifid, ultimate segments oblong-ovate, somewhat glaucous.

var. *californica* (*P. californica*, Nutt.), with leaflets bifid or



Fig. 25.

trifid, never pinnatifid, ultimate segments oblong-lanceolate, acute and not glaucous. Appears distinct. (See fig. 25.)

Sub-genus Pæon.

Herbaceous. Petals not leathery, large and expanding, much exceeding the sepals.

A. Leaves pinnatisect, with numerous narrow divisions, glabrous.
(See fig. 26.)

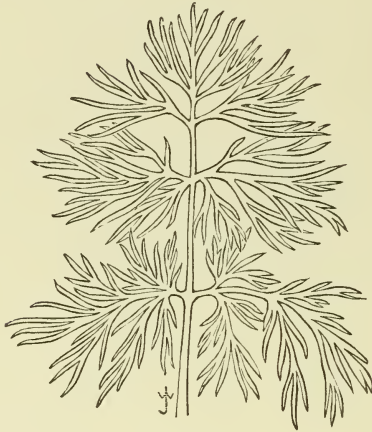


Fig. 26.

3. *P. tenuifolia*, L., *Bot. Mag.*, t. 926.—Stoloniferous. Leaves ten to twelve, the longest about one-third the length of stem, not longest below; segments linear. Flowers seated on the upper leaves. Petals dark crimson. Transylvania to the Crimea, Caucasus, and Armenia.

4. *P. hybrida*, Pall., *Bot. Reg.*, xiv., t. 1208.—Not stoloniferous. Leaves about six, the lower long, about half the length of stem; segments linear-lanceolate. Flowers stalked above the leaves; petals dark crimson. Not a hybrid. Native of grassy places in the promontory of the Caucasus, especially near Stauropolis; rare in Tauria. *P. laciniata*, Willd., according to Bieberstein.

5. *P. anomala*, L., *Pall. Fl. Ross.*, t. 85 (*P. sibirica*), described as *P. laciniata* at p. 93; *Bot. Mag.*, t. 1754.—The type alone is figured; it has glabrous carpels, with other marks of distinction, and may not be in cultivation—though *P. sibirica* from Canon Ellacombe, called *anomala* in the Kew

Herbarium, might prove to be it. The cultivated forms belong to one botanical variety, *P. a. insignis*. It has stems $1\frac{1}{2}$ to 2 feet high; leaves about ten, the lower about one-third or one-quarter the length of stem; segments lanceolate; carpels with red pubescence and leaves reducing to the flower (typ.), or with leaves not reducing to the flower (P. Barr), or having carpels with white pubescence (F. W. Moore). The leaves are sometimes very slightly pubescent.

B. Leaflets normally quite entire, rarely divided, but sometimes deeply to the base; never decurrent or confluent, except sometimes the lateral leaflets of a terminal trio. (See fig. 27.)



Fig. 27.

* *Carpels glabrous.*

6. *P. Wittmanniana*, Stev., *Bot. Mag.*, t. 6645.—Leaflets thin, ovate, deep green; distinctly pubescent beneath. Corolla pale yellow. Caucasus and mountains of Persia.

7. *P. coriacea*, Boiss.—Leaflets broadly ovate, firm in texture when mature, glaucous below, with no sign of pubescence. Corolla large, bright crimson. Alps of Grenada, mountains of Morocco, and Algeria.

** *Carpels hairy.*

† *Leaflets almost, if not quite, glabrous below.*

8. *P. triternata*, Pallas (*P. daurica*, Andr.), *Bot. Mag.*, t. 1441.—Roots oblong or cylindrical. Stems green. Lowest leaf usually inserted at some distance from the ground, not very long; leaflets nearly round, undulated, greyish-green above, sometimes very slightly pubescent below. Flower rose. Caucasus, Asia Minor, and the Crimea.

9. *P. corallina*, Retz., *Eng. Bot.*, t. 1513.—Root spindle-shaped or knobbed. Stems reddish. Leaves long below; leaflets broadly ovate, often broadest towards the top, flat, deep green above with reddish veins, quite glabrous on both sides. Corolla crimson. Follicles densely villose. This is the *P. mas* of Pliny. It is not British. France to Asia Minor.



Fig. 28.

10. *P. Broteri*, Boiss et Reut.—Root cylindrical (one received from Barr). Stems reddish. Leaflets ovate, acuminate, broadest about the middle. Corolla rose-red, sometimes white. Follicles pilose. A new ally of *P. corallina*. Mountains of Spain and Portugal.

†† *Leaves decidedly hairy below.*

11. *P. Russi*, Bivon.—Root of *P. corallina*. Lower leaves exactly biternate; leaflets thin. Corolla crimson. Carpels

finely pubescent, strongly reflexed when mature. Corsica, Sicily, Sardinia, and Algeria.

C. Flowers more than one on each stem. All divisions of the leaf beyond the three primary ones strongly decurrent. Glabrous. (See fig. 28.)

12. *P. albiflora*, Pallas, *Pall. Fl. Ross.*, t. 84; *Andr. Repos.*, t. 64; *Bot. Reg.*, t. 42; *Bot. Mag.*, tt. 1756, 1768.—Common and well known. Comes out of the ground in spring with strikingly bright red, long, and slender buds. Leaves at first reddish, then of ruddy green. Sepals with strongly secreting glands, very attractive to ants. Single and double garden varieties vary from white to red. Carpels three to four, glabrous, though sometimes pubescent in bud. Siberia.



Fig. 29.

13. *P. Emodi*, Wall., *Bot. Mag.*, t. 5719 (good).—Leaves deep green, not ruddy as in *P. albiflora*. Flowers white from the axils of upper simple leaves. Carpels one, rarely two; tomentose. Western Hemisphere, Himalayas.

D. Leaves of deep green colour, light green below, and not glaucous, rarely slightly pubescent; leaflets broad, cut and fissured. Sepals glandular, but not with secretion so copious as in *P. albiflora*. Corolla large and handsome. (See fig. 29.)

14. *P. officinalis*, Retz., *Bot. Mag.*, t. 1784.—As above. The

common species in gardens ; single and double species vary from white to red. Southern half of Europe.

var. *lobata* (*P. lobata*, Desf.), Sweet, *Fl. Garden*, t. 70, not of Rchb., *Flora Germanica*.—Dwarfer than all the forms of *officinalis* proper. Leaf segments numerous, very obtuse, and decurrent, much imbricated, sometimes slightly pubescent below. Easily recognised by its unique brilliant salmon-coloured flower. Native of Portugal according to De Candolle's *Systema*.

E. Leaves glaucous, or of very pale green above, generally of striking grey-green aspect ; leaflets glaucous below, and very rarely without distinct pubescence, always divided, and with the lobes often fissured. (See figs. 30-33.)



Fig. 30.

I. Flowers distinctly stalked, not apparently sessile, and resting on the upper leaves.

* *Carpels glabrous*.

15. *P. humilis*, Retz., *Bot. Mag.*, t. 1422.—Stems $1\frac{1}{2}$ to 2 feet high. Leaves biternate, petioles tinged with red, the terminal free, stalked, divisions of three lobes, the middle one trifid. Corolla rose-red. Stigmas long and upright, hooked at the top. South of France.

16. *P. microcarpa*, Boiss. et Reut.—A very near ally of the preceding ; the cultivated plants, so far as I have seen, not easily distinguished. The Cambridge plant has very red petioles,

with leaflets narrower than those of *humilis*, very pubescent beneath. Mr. Baker describes the plant as having stems 1 to $1\frac{1}{2}$ foot long. Lower leaves, with about thirty oblong acute confluent segments, $\frac{1}{2}$ to $\frac{3}{4}$ inch broad, very pubescent beneath. Outer sepals not so compound as in *humilis*. Petals bright crimson. Follicles two, very spreading, smaller than in *humilis*. Mountains of Spain.

** *Carpels hairy.*

† *Terminal free (stalked) divisions of the leaf usually three-lobed, with the middle lobe trifid.* (See fig. 30.)

17. *P. decora*, Anders.—Stems 2 to 3 feet high. Leaves horizontal, diminishing to the top; leaflets oblong-obtuse, longitudinally concave. Flower rather smaller than is usual in the genus, supported on a long peduncle (Anders.). Petals about eight, small and narrow. Carpels very large, spreading from the base when mature. Anatolia and Servia.

Anderson distinguishes two varieties—*Pallasii*, with leaves narrowly oblong, and *elatior*, with leaves broadly oblong. The plant grown as *decora elatior* may be recognised even in a weak state by having few processes of the disc, with a connection between the carpels at the base of similar surface and appearance to that of the carpels themselves. This connection between the carpels is found also in *triternata*.

18. *P. peregrina*, Mill. (as understood, I believe, by Anderson and Miller).—Stems about 2 feet high. Leaflets ovate-lanceolate, usually flat.

var. *byzantina*, Anders.—A smaller plant than *arietina*. Stem 2 feet high, covered with white hairs. Leaves biternate, remarkable for pale grass-green colour; middle leaflet three-lobed, deeply incised or pinnatifid; leaflets more obtuse at the base than those of *arietina*, rarely decurrent. Calyx glabrous. Seeds oblong. I have not seen a plant that answers this description or to match the specimen in Kew Herbarium.

var. *compacta*, Anders.—About 1 foot high. Leaflets broad and imbricating, ultimate divisions very obtuse, deep green above. Calyx pilose at the base. Corolla purple-red. Seeds round.

var. *Grevillei*, Anders.—About 2 feet high. Leaflets deeply incised, not imbricating, undulated, sometimes twisted, of pale-green colour, margins red, ultimate division very acute. Corolla purple-red. Seeds round.

19. *P. paradoxa*, Anders. ; Sweet, *Brit. Fl. Garden*, t. 19.—About 1 foot high, the dwarfest except *mollis* and *sessiliflora*. Forms a dense tuft of leaves. Leaflets three-lobed and incised, the fissures short and obtuse, much imbricated, and with red margins. Carpels pressed close together, and little separated in the ripe fruit. Corolla purple-red. A close ally of *peregrina*, from which it is known by smaller ovate and more glaucous leaves, with more divided, crowded, and imbricating leaflets. Montpellier and Trieste.

†† Terminal free divisions of the leaf three-lobed; the middle lobe rarely bifid, never trifid. (See fig. 31.)
§ Leaflets about twice as long as broad.



Fig. 31.

20. *P. arietina*, Anders.—The largest species of this section. It is well marked by decurrent leaflets, with strongly arched and even recurved carpels when mature. South of Europe.

var. *Andersoni*.—Leaves blue glaucous green. Corolla deep rose, petals slightly crisped. Perhaps native of the Levant.

var. *cretica* (*P. arietina oxoniensis*, Anders. ; *P. cretica*, Clusius). Leaves pale green. Corolla pale rose, or nearly white, petals

lacerated. This is one of the earliest of Pæonies, and may be known as it comes out of the ground in spring by the pale glaucous green colour of the leaves. Mountains of Crete.

21. *P. Bakeri*, n. sp. (*P. peregrina byzantina*, Hort. Barr).—Root cylindrical or somewhat spindle-shaped. Stem stout, about 2 feet high, red or reddish, flexuose, pilose from the lowest leaf to the flower. Leaves about six, biternate, the lowest often inserted at nearly its own length from the ground, not quite one-third as long as the stem; petioles reddish; leaflets (all divisions cut to the midrib or secondary petiole, and in symmetry



Fig. 32.

with the rest of the leaf), 13 to 15 of lower leaves, 3 to 3½ inches long, broadly ovate, acute, margin reddish, and upper surface often suffused with reddish tint, all strongly decurrent and quite entire, except that the terminal middle leaflet may be cut once deeply (as in fig. 32), very hairy beneath and glaucous. Flowers always (apparently) 2-bracteate; calyx slightly hairy, sepals five, oval or rotundate; corolla deep rose, about 4½ inches across, opening fairly flat; petals eight, obovate, slightly crisped, usually with white median line beneath. Carpels tending to three, arcuate.

One of the most distinct as a species in this group. Its habit resembles that of *P. triternata*. It is twice as tall as *P. arietina Andersoni* in the Cambridge Botanic Garden. Differs in important particulars from Anderson's description of *peregrina byzantina*, who does not remark some features of this plant. In the

Kew Herbarium it is referred to *pubens*, but from that it differs greatly in the shorter leaflets and colour of the flower. (Compare figs. 32 and 33.)

§§ *Leaf segments three times, or more, as long as they are broad.*

22. *P. pubens*, Sims, *Bot. Mag.*, t. 2264.—Stem hairy. Leaf segments tapering to a point, very hairy below, margins red. Corolla rosy red. (See fig. 33.)

23. *P. Barrii* (*P. Russi*, *Bot. Mag.*, t. 3431, non Bivon).—Leaf segments about five times as long as broad, scarcely

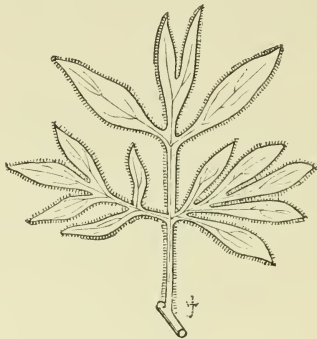


Fig. 33.

pubescent, but very glaucous below. Corolla brilliant red. Requires a new name, as the type for similar plants with narrow segments scarcely hairy beneath.

II. Plants dwarf, with flowers subsessile, appearing to rest on the leaves.

24. *P. mollis*, Anders., *Bot. Reg.*, vi. 474; Sweet, *Brit. Fl. Garden*, vol. ii., t. 103; *Lodd. Cab.*, t. 1263.—Stems a foot high or more, rigid. Leaves dark bluish green, flat, compact, and much divided; secondary petioles almost wanting; segments broadly lanceolate or oblong, crowded, imbricating, not bordered with red, densely hairy below. Corolla small, purple-red. Carpels usually three, erect, slightly incurved. Anderson suspects it to have come from the Crimea.

25. *P. villosa*, Sweet, *Fl. G.*, t. 113 (*P. sessiliflora*, *Bot. Mag.*, t. 2648).—Nearly related to the above, but with secondary petioles

not abnormally short, leaf segments and carpels nearly the same. Corolla white. I am assured that this must be distinct as a species from *P. mollis*, but I have not seen them growing together.

CONCLUSION.

Among other gentlemen I have greatly to thank Mr. Barr for his liberality in sending me specimens and generally in placing his knowledge at my disposal. I have greatly to thank Mr. Moore, of Glasnevin, for his liberality in sending me specimens, and it is only fair to say that the Glasnevin collection is remarkably rich and well named. The specimens that were exhibited came from the Cambridge Botanic Garden in part only. I have to thank Prof. Foster and the authorities of the Botanic Gardens at Glasnevin, Kew, and Oxford for certain specimens that I could not provide to the same degree of development, or that I could not provide at all.

DISCUSSION.

The Rev. W. WILKS : Mr. Paul particularly wishes me to say a few words on the cultivation of Pæonies, as he knows my infatuation for these too little known plants, and the large collection of garden varieties which I have. Now Pæony-growing is not a case of "small capital and quick returns," it is rather the reverse. It is in its way and degree like planting fruit-trees : a comparatively large sum must be spent at planting, and then the planter must be content to wait three, four, or even five years before he reaps the full reward of his patience, labour, and expense—but then what a reward it is ! Kings and queens, nay, very emperors, of the herbaceous border are these Pæonies, so rich and varied in their colours, from the purest white of driven snow, through ivory and yellow, pink and salmon and crimson, to the deepest blood-crimson, and a few which have such an intensity of colour as to look almost claret-brown. And then the scent of most of them, like a mixture of frankincense and roses ! Yes, the reward is well worth all the outlay, all the patience, all the toil.

To grow Pæonies successfully you must first well trench the ground and dig in a quantity of the richest possible manure—how much I cannot say, for I have not yet discovered the limit

of a Pæony's greedy appetite—but the manure itself should not actually touch the young plants when first put in, as it encourages slugs and wireworm to come and devour the wounded tuberous roots. The distance from plant to plant that I have adopted, and I do not think you can improve upon it, is 3 feet, and the distance between the rows (if grown in a bed) 4 feet. The little rosy crowns of the young plants should be planted in November and placed about 1 inch, or $1\frac{1}{2}$ inches, below the surface of the ground, but in my opinion not deeper, as I believe the Pæony rejoices in heat, and even in comparative dryness, *after* it has done flowering. It loves to roast its crowns and tubers in sun-heat, in preparation for its next year's efforts. The first season after planting all they will require will be to be kept free from weeds, their leaves loosely tied up to prevent their being blown off by high winds, and copious watering in dry weather till the blooming season is well over, *i.e.* till about the second week in July; and if any of them show bloom-buds the first year after planting, it is a wise self-sacrifice which gently nips them out and is content to wait.

The second and subsequent years they will want more attention. In November cut off all the fading foliage, lightly fork the bed over, being careful not to turn up more than an inch of the soil close round the plants, and not more than 2 or 3 inches anywhere. No spade should ever be allowed in the Pæony bed, except to plant with. Leave the ground rough through the winter; do not attempt to protect or coddle them; the colder they are the better, as they will not start so soon in spring, which is the only danger. In February, when the frost is on the ground, give them a mulching all over the bed of 2 to 3 inches of rich cow-dung, taking care, of course, not to place any immediately over the crowns, but close round them. When the young growths are about a foot high they should be lightly secured against wind-breakage, and as soon as the sharp frosts are well over, say from the end of April, they should be well soaked (for they are very deep-rooting plants) with strong manure-water. not pouring it on the crowns, but around them, and this should be continually repeated until July, unless the weather or the soil be exceptionally wet. In May the plants should be carefully gone over once a week, and all the side flower-buds carefully nipped out, leaving only the central or main bud:

this is of the utmost importance with all the double varieties, but does not apply to the single ones, which are far more beautiful if the side buds are left on, but the doubles are so double that they have quite as much as they can manage to develop one good flower on every stalk. When blooming time is over the seed-vessels should be carefully removed, one more soaking of manure-water given, and then leave the bed till the November clearing-up time comes again, and then, *da capo*, never omitting the 3-inch mulch of cow-dung or its equivalent.

THE CULTIVATION OF HARDY FLOWERS.

By the Rev. C. WOLLEY-DOD, M.A.

[Read June 24, 1890.]

OUR problem for to-day is, "given a garden, it is required to make it gay with hardy flowers for about ten months in the year." Hardy flowers suitable for mixed borders often belong to plants of shrubby habit, or bulbs or annuals, but the larger part of them grow upon herbaceous plants. Time will not allow me to include to-day any description of the special cultivations of rock plants, or alpines properly so called, though the term "alpines" is often used indefinitely, and includes many things suitable for the mixed borders; but I propose to deal with hardy plants, as the term is generally understood by the mass of amateur gardeners, to whom I address myself.

Probably all my hearers have a garden with hardy plants in it already; they wish to know how to select more, and how to grow them all in the best way. In visiting other gardens they make notes of what they see and admire, they observe what is praised in gardening journals, and in due time send an order to a nurseryman, and when the fifty plants ordered arrive, they plant them haphazard in the mixed borders. The result rarely comes up to their expectation. Perhaps many of the things ordered would never thrive in their soil and climate under the most skilful treatment—for every plant has its likes and dislikes, which must be considered if it is to do well.

In the first place, the soil must be well drained; amateurs

must learn what this means and see that it is done. Most soils are well drained by nature, but my own garden is an example of the contrary. Formerly every flower-bed on a sloping lawn filled with water, and ran over at the lower side in wet weather, and of course nothing choice would grow until this was remedied. You may try your soil by digging a hole 3 feet deep in your flower border, and filling it with water; if after three or four hours the water stands in the bottom, artificial drainage is probably required; but different parts of the same garden may vary much. A good test of drainage is afforded by plants themselves. Observe *Gentianella*, *Hepatica*, and *Christmas Rose*. If the two last keep their old leaves through the winter till the new ones come, and if all the three flower well, your garden may be gay with flowers all the year round; but where any one of the three flourishes there is not much fault to find with the drainage of the soil.

However, it is better to be contented at first to make up your flower borders with plants which you know by your own experience, or that of your nearest neighbours, to do well in your soil and climate. In this way you will bring no failures into conspicuous places, and visitors to your garden will observe how well everything seems to do. But every garden, however small, must have reserve and trial beds behind the scenes. It is better to try to do, if possible, with fewer cabbages and potatoes, and to take part of the kitchen garden for the reserve beds. These beds should be composed of different mixtures of soil—some of the natural soil of the garden, some lightened with leaf-mould or sand, some mixed with lime and brick rubbish, and so on. Have as many of them as you can, both for providing flowers for house decoration—some of the best of which grow on very unsightly plants—and for propagating what you wish to increase; also for nursing seedlings till large enough for the mixed borders, but mostly for gaining experience with plants new to you, and finding whether you can do well with them, and in what soil they do best. You can then promote them to a more honourable position when you please.

Flower borders should never be dug, unless you intend entirely to empty and replant them. In strong and exciting soils, in which plants grow fast and are short-lived, this should be done every five or six years; in the intervals you will from

time to time have made notes about the arrangement of the plants in the bed, in which you should consider how and where each thrives best as much as where it looks best, because the first condition generally ensures the latter. In planting observe that some plants will flower from top to bottom, if not crowded, and want to be seen all round, especially those of shrubby habit; others, such as Lilies, *Lychnis chalcedonica*, and the like, flower only at the top and want less room in proportion. Therefore do not attempt to plant by rule as regards distance, but consider what space each plant wants in order to be seen to the best advantage, and give it that space. As for filling the blanks between the principal large plants with dwarf early-flowering things such as bulbs, it requires careful judgment and experience, or the whole border will be made a failure by it. Wood Anemones, for instance, which I have seen recommended for this purpose, are very exhausting to soil, and few things can grow through the dense mat which they make on a surface where they are established. Never replant old lumps of anything; nearly all plants are better for being pulled into small pieces when moved, so that every part of the root can find its way through, to be fed by the renovated soil. There are some few plants, it is true, which should never be moved or divided; of these the *Fraxinella* is a notable example; Giant Poppies too and some kinds of *Eryngium* will grow for a generation in the same spot without exhausting the soil; such things may be left growing, and be dug round, when a border is renewed. The feeding roots are so deep that this may easily be done.

The most convenient size for a mixed border is seven or eight feet wide, when accessible from both sides, so that every part can be reached without walking upon the soil. A large proportion of hardy plants show a decided preference for an eastern aspect, or a slope towards the east. It is not east wind that they like, but morning sun; and if they can be sheltered from the wind without taking away the sun, all the better. A western aspect is the worst of all. Many choice plants dislike mid-day sun, and do best on the north side of a slope. In recommending shade, the prevailing atmospheric conditions in each district must be taken into account. Plants which do well in shade in Kent or Surrey might die for want of light if planted in the shade in a sunless part of the kingdom like Cheshire; but

shelter from wind is far more important to many plants than shade. Most sun-loving plants are quite contented to see the sun from sunrise to mid-day. However, every garden does not admit of choice in these matters, and plants must be selected and placed according to circumstances; but as regards soil, it may be made heavy or light, and lime or stone may be added according to the preference shown by each in the trial-beds.

By far the best time for replanting is early in autumn, not later than the middle of October; roots will then have enough activity to fix the plant to its place before the dead time of winter. Things which cannot be planted before the end of October had better be left until just starting to grow in spring, though in that case a spring of late frosts and dry east winds will cause many to fail; but the worst time to move is when all the leaves are dead, and the plant is absolutely at rest. It then cannot anchor itself to the soil; it remains with loose roots all winter, and subject to evil influences which nothing but the strongest constitutions can overcome.

I mentioned about five years as the average time during which a border may be left nearly to itself after planting, if weedy and rapidly spreading plants on the one hand and short-lived or delicate plants on the other are avoided; and this leads me to say something about the average duration of the life of hardy plants. This depends in a great measure on the soil, as they wear themselves out far more quickly in a moist and retentive soil than where it is sandy and dry. Some deep-rooted plants will go on for many years flowering annually in the same spot without deterioration. Others continue only on condition that they are allowed to roam and seek ever new pastures for their roots. Some of my choicest plants—the best Columbines, for instance—seldom flower well for more than two seasons. With other plants, the richer the soil the more they multiply shoots; and, if not divided and moved, a plant which in poor soil might have lived ten years or more becomes helplessly exhausted in three or four. I therefore determine five years as the average ornamental life of a plant in cultivation, where, it must be remembered, life is under very artificial conditions. Then there are some plants which grow for four or five years from seed or cuttings before they flower well, and such plants must be grown on in the store-beds. Others never do so well as the season after

they have been planted as single shoots in the previous spring or autumn. All this must be learnt by practice. As for plants of running habit, they should be avoided in mixed borders. It is ruin to most of them to try to keep them in bounds by cutting round, as by this all the best flowering shoots are cut off. I have tried confining them by underground earthenware hoops, or within boards, without much success. Therefore such subjects as *Helianthus rigidus* and *Anemone japonica*, which few of us can do without, must have special arrangements made for them; but, however they are treated, it is better to keep them in full view, where they can be under constant control, and to assign to them a sufficient breadth of soil to prevent their soon exhausting it.

Another question which occurs in selecting occupants for a permanent border, expected to last for years, is that of hardiness. This is, of course, a relative term, and there can be no absolute standard fixed. Some plants which are called hardy may withstand perhaps twenty, perhaps thirty degrees of frost; their power of withstanding depends upon a combination of surrounding conditions and attendant circumstances. What we want to know, and it must be learnt chiefly by our own experience, is the relative hardiness of each plant in our own garden. Many a plant is well worth growing which is killed once in five, or even once in three years, but such plants should not occupy positions so prominent that their death would leave a conspicuous gap. A hardy plant may even require annual renewal by cuttings, to be wintered under glass, and be quite worth the trouble. Other perennials seem soon to lose their power of breaking in spring from the hard or woody base, and are lost if not renewed by seed or cuttings about every third year. Such are *Hypericum olympicum*, *Ononis rotundifolia*, *Gypsophila paniculata*, &c. When we have once lost all our stock of a good plant we should consider by what precautions we might have saved it, and take them another time. Perennial does not mean everlasting or immortal, as some cultivators seem to think. As soon as a new plant is obtained, our next thought should be how to increase it; when we have succeeded in this, we should try what soil, what aspect and surroundings suit it best. Without neglecting what you can learn from others about its successful cultivation, try yourself to discover something new in this way. Gardeners

should never be content with imitating, and should not think too much about imitating nature. Those who have seen the plant growing wild are perhaps more likely to succeed with it than those who know nothing about its habits; but as this subject has been fully discussed lately I will only say, never think you cannot cultivate a plant successfully because you cannot imitate the conditions in which it is known to thrive in its native home; you may find it flourish still better under very different conditions which you can easily give. But one thing no man can do or ever will do, and that is, train a plant by habit to live in a greater cold than it is made by nature to bear. What is called acclimatisation, or habituating plants in successive generations from seed to become hardier than nature made them, seems to me to be a theory unsupported by the experience of facts. Plants may adapt themselves in the course of ages to very gradual lowerings of temperature in their native home, but it cannot be done suddenly, or in the space of a man's life. I believe an individual plant of any cosmopolitan species will be equally hardy whether the seed from which it is raised is gathered in the tropics or in the arctic regions.

Everyone who wishes to have many herbaceous plants should grow them from seed for many reasons. Seedlings thrive better and are hardier than divisions of a plant; by saving seed in your own garden you may exercise a judicious selection in gathering it. Then it must be borne in mind that not only species but individual plants vary in constitution; some seedlings will grow more vigorously and flower more freely than others raised from the same pod. For all who understand how to deal with seedlings time is saved by sowing seed as soon as it is ripe; if it does not come up at once, it will come up sooner than if stored in a dry cupboard. Every species includes good and bad forms, and it is desirable to select the best; when once selected they are generally easy to keep. Seeds come up better when sown under glass, but artificial heat is often bad for them. The seedlings should not at any time of their growth be crowded. For transplanting them I use trays made of 4-inch deal laths, about 5 inches deep, and 20 inches long by 14; the laths put together with intervals to allow for drainage and air to the soil. When wooden boxes are used for plants it is well to smear the

inside with paraffin and set it on fire to char the surface; this prevents the growth of fungus.

It is well to notice how long each species takes to attain its climax of perfection from seed. Some perennials take two years, others as long as ten; they are liable to vary so much in height, their first, second, and third year of flowering, as to make the same position in a mixed border unsuited to all these stages of growth. Observe, for example, the annual progress of *Campánula lactiflora* or *Spiræa Aruncus*. Before dismissing the subject of raising from seed, I may say that it is well to avoid disturbing without good reason the soil near rare plants, as I have often found spontaneous seedlings when I have been unable to rear gathered seed. This, again, may suggest that it is wise to imitate nature; but let us consider how small a proportion of seeds become mature plants in nature. Let us take the case of a perennial which lives five years and produces a hundred ripe seeds each year; we thus get a proportion of one in five hundred. Gardeners expect and obtain a far better result than this.

Many good plants which are short-lived and shy of ripening seed must be frequently increased by cuttings or by division. In the case of florists' flowers like Phloxes and Pyrethrums, rules for propagation are readily accessible to all gardeners; but rarer plants have to be carefully studied. Some, like the double *Lychnis vespertina*, are so hard to increase that the market in them becomes almost a monopoly. Others are easy to divide and to strike only at some limited period of their growth—perhaps during one week in each year. I have heard it said of a famous gardener at Baden-Baden that he sits up all night rather than miss the right moment for dividing *Omphalodes Luciliæ*. Some things require long patience to grow them from cuttings into plants. *Daphne cneorum* and *Lithospermum prostratum* take four or five years before they are large enough to make a show; it is a sound rule to take a few cuttings of all such plants every season, and cuttings make far better plants than layers. Another item of advice I will give is to utilise for growing flowers every corner of the garden, especially if the garden is small. There are always neglected shady spots, which a few stones covered with leaf mould would easily convert into an attractive bed of hardy Cyclamens. Other sheltered places

under north walls might be filled with the stalked Hellebores known as Lent Roses. Coloured Primroses in various forms are far more ornamental than nettles and chickweed, and would generally thrive where these have been eradicated. A little method easily keeps a garden clear of weeds when it has once been cleaned.

I have said little about improvement of soil, because I do not wish it to be thought that a gay and flowery garden cannot be made with the materials which everyone has at hand; but no doubt in many cases the number of choice plants which can be grown successfully may be much increased by the addition of peat soil to some of the beds. Also, if the natural soil is stiff clay, it is generally advised to burn some of it and break it small and mix it with the rest; but it is not very easy to construct the kilns for burning, unless the services of a brickmaker can be obtained. In my own garden, where the natural soil is a most unpromising cold clay, I have found very successful results by getting riddlings from stone quarries of the size of small gravel, and mixing it with the soil. The rougher and harder the stone, the better; this is far superior to ordinary pit or river gravel, which rolls together and collects in hollows on the surface. Indeed where soil is heavy and strong it is difficult to add too much of such material. Half, or two-thirds, of it to a depth of a yard makes excellent border soil; and by adding a still larger proportion I can grow even such genuine rock plants as *Saxifraga oppositifolia* on the level ground.

It is desirable to have borders varying in their degree of lightness. Road-scrappings, leaf-mould, coal-ashes, and all similar materials are invaluable for mixing with heavy soils. On such soils it is well to raise some of the beds 2 feet above the ground by blocks of stone round the sides. Not only does this help the drainage, but the stones may be covered with Aubrietias, dwarf Phloxes, Rock-roses, and such like ornaments down to the ground. Tree stumps are not good for this use; they encourage the growth of funguses, and give too ready shelter to vermin of all kinds. This reminds me to speak of garden vermin in general. I could tell ill-natured tales of many little birds, but, next to a garden without flowers, I should object to a garden without birds, or one in which birds were persecuted; but I will make an exception of sparrows, which have no redeem-

ing virtue, and in the extermination of which I would gladly join. Pheasants should not be encouraged; they annihilate Scarlet Anemones—flowers, leaves, and roots—if not protected within wire netting, and destroy all the flowers of Fritillarias, besides doing other mischief. If there are rabbits near, the garden fence must be made absolutely proof against them, as they always pick out the choicest plants to feed upon. The long-tailed field-mice, which dig for Crocuses, are easily trapped, and are harmless compared with their short-tailed brethren. If your garden adjoins meadows, these marauders sometimes invade it in swarms, and eat off the young growth of choice plants, especially Campanulas, in spring. Luckily their movements are generally followed by weasels, which as well as owls I always welcome as friends, and as far more effective against these field-voles than any traps are. Shrew-mice, as well as frogs and toads, feed upon insects, and though they destroy some slug-eating beetles, the balance of their work is on the side of good. Small slugs, though they seldom are seen in winter, are more destructive at that season than the most severe frosts, which are often wrongly accused of being the cause why Delphiniums, Pyrethrums, and such-like perennials are found dead when they ought to be making a show of growth in spring. Two or three slugs burying themselves in the crown of a herbaceous plant in autumn eat off the young shoots as fast as they try to grow, and are the ruin of many choice flowers in warm and wet winters. The cultivation of some herbaceous plants would be impossible with me if I did not constantly use precautions against slugs. A mixture of coal-ashes, soot, and lime put over the crowns of all palatable perennials early in autumn, and renewed from time to time, is the best remedy; finely broken coke is pretty good, when the slugs are not already hidden in the crown; but every device that has ever been recommended, besides every new scheme you can invent, should be perseveringly put in practice against these worst of garden enemies. A liberal dressing of finely broken stone, in sharp angular fragments, as described above, may be spread over the whole surface of the border. It makes travelling disagreeable to soft-bodied vermin, besides keeping the soil sweet and preventing it from caking. But besides these visible pests, garden plants are subject to many kinds of blight and disease, some of which are within

our control. The amateur gardener should observe and study all unhealthy symptoms, and at once try such treatment as is suggested by the advice of experts. The effect of the remedy will often be the means of discovering the cause of the ailment.

What shall be said of labels? At the best they are a nuisance and an eyesore in private gardens, and our study should be to do without them as far as possible; they add nothing to the pleasure of gardening. But when it is necessary to mark plants or bulbs which quite disappear, the compound label, made of a small wooden tablet fastened on to a stout upright wire is most convenient and durable; but every gardener likes best the label he uses. The names themselves are as bad as the labels. To be asked the name of a neat little white flower, and to have to bring out "*Bænninghausenia albiflora* of Reichenbach," is a strong temptation to reply "I don't know" to the question. The earliest Greek poet has told us that men bring upon themselves by their own folly many more troubles than they were destined by fate to suffer, and surely long botanical names belong to the class of self-imposed and avoidable evils. Enough pronounceable combinations of letters might be made without exceeding six in any word to supply all the plants in the world with two names apiece. Still I question the advantage of coining and trying to force upon the public arbitrary English names for garden plants. Till a flower has become popular enough to make an English name for itself, it seems better to call it by the scientific name which is common to all languages. Some of these names are hard to pronounce, and it may be doubted how far etymological correctness should be waived in deference to popular usage. We may agree to shorten in pronunciation the last syllable but one in *Veronica*, *Oenothera*, *Hypericum*, though we know it is wrong, but remonstrate against doing the same with *Erica*, *Echinops*, *Agave*.

As to watering, my own garden is so well supplied with water that I cannot understand a never-watered garden. There are no doubt many, but scarcity of water in summer certainly limits the number of plants which may be grown well. Such things as herbaceous Phloxes will hardly flower at all in a dry summer without watering, and it is almost a necessity for what is newly planted. But watering when not wanted is bad for

gardens. There are certain conditions of the atmosphere when every plant looks as if it were dying for want of water, though the soil is quite moist. This happens when rapid evaporation is going on, and it is a condition very unfavourable to flowers, but watering is no remedy for it.

Tying up plants is often condemned as giving a stiff and formal appearance; yet in wet soils, where stalks are deficient in backbone, the flowers of tall plants are soon spoilt without it, as the tops often turn over and rest their heads upon the ground in rainy weather. Even if they recover from this posture the stem is left crooked and twisted, and they never look happy afterwards. I find it best to have an abundant supply of iron rod, three-eighths of an inch thick, cut into lengths of from three to eight feet. These last for ever, and are always ready. In situations exposed to wind, strong tying material such as soft sacking twine, is often wanted. Plants which require support when in flower had better be tied as soon as there is any stalk to tie, so that they may never get bent. Do not wait for a gale to lay them low before tying, but always tie as if a gale were coming to-morrow. Well-tied plants are improved in appearance, as the flowers are better displayed, but it is often necessary to have three or four rods to a plant of many stalks.

If you wish to have every plant in your borders as fine as possible, you must not cut them down as soon as they have done flowering. In the garden of hardy plants there must always be a certain proportion of dead and dying foliage and flower-stalks. Some of them are ornamental, but such things as Colchicum and Daffodil leaves must be tolerated, whether ornamental or not. This mixture of withering flowers and leaves seems to many a serious objection to borders of perennial plants, and I know that many visitors have gone away from my garden disappointed, and have decided not to change the neat and trim arrangement of their ribbon borders, and their masses of bright colour, for such an untidy wilderness as they have seen at Edge; and it is true that the bedding-out system is better suited to some tastes and some situations. But besides the objections on the ground of untidiness, the arrangement of the plants in the mixed border will never please all comers. Some wish to compromise matters with the advocates of bedding-out by planting each kind in large masses. This, of course, involves large flower-

less blanks wherever a plant is out of flower. My advice to every amateur is to please himself. There may be often unfortunate contrasts of colour in a mixed border, but accidental combinations will often please more than others which are carefully studied, but which depend upon the variable caprice of particular plants. Make whatever arrangement you please, you are sure to hear plenty of criticism and to get plenty of gratuitous advice, and if you acted on it all you would change the place of every plant in your borders two or three times in a season. Do not imitate other gardens, but try to be original. Gardens would be very dull and uninteresting if all were planned and planted on the same model. Always be studying how you may have more flowers, and let them be so distributed that your garden may seem full at every season. Note times which are deficient in flowers of each particular colour, and look about in other gardens for any which will supplement these deficiencies, so that from the finest Snowdrop to the last Michaelmas Daisy there may be no flowerless time. Above all, display in your chief borders only what you can grow well, and nurse your failures in the background till they are no longer failures. To sum up, study your soil and do your best to improve it; study the habits of the plants you grow; keep up a good stock for succession and for replacing losses; do not think so much of how many species you can grow as of growing nothing which is not ornamental in itself, and which you cannot grow so as to be ornamental.

As for the material from which these are to be selected, we find endless choice in the nurserymen's catalogues, some of which enumerate about two thousand names of hardy plants, without including florists' flowers. From these I have selected about three hundred, most of them things cultivated at Edge. Shrubs and spring bulbs are not mentioned, though many of them must of course have a place, and florists' flowers must by no means be excluded. In the appendix of names about a hundred of the best plants have a distinguishing mark.

APPENDIX I.

LIST OF THE BEST HARDY PLANTS FOR MIXED BORDERS.

† Plants which vary in colour or form from seed, and require selection.

* About a hundred of the best are so marked.

o Good plants, which do not succeed at Edge.

Achillea aegyptiaca.	Aster turbinellus.
„ filipendulina.	„ acris, &c.
„ tomentosa.	oBaptisia australis.
oAcanthus mollis.	Bocconia cordata.
oAlyssum saxatile.	Boltonia decurrens.
Aconitum Napellus bicolor.	Bupthalmum salicifolium.
* „ „ albus.	†*Campanula carpatica.
o „ japonicum.	* „ turbinata.
Adonis vernalis.	„ abietina.
*Anthericum Liliastrum.	† „ latifolia.
„ Liliago.	†* „ persicifolia.
„ ramosum.	„ Hendersoni.
†Anthemis tinctoria.	„ Van Houttei.
Anemone alpina.	„ rhomboidea.
„ sulfurea.	„ „ alba.
* „ Pulsatilla.	„ „ pulla.
* „ narcissiflora.	†* „ pumila.
„ nemorosa major.	† „ barbata.
„ „ flore pleno.	†* „ garganica.
„ „ Robinsoniana.	* „ Portenschlagiana.
„ trifolia.	Campanula pyramidalis.
„ silvestris.	„ Trachelium fl. pl.
„ rivularis.	† „ glomerata.
„ ranunculoides.	†† „ lactiflora.
* „ japonica.	†* „ grandiflora.
* „ „ alba.	Cardamine pratensis fl. pl.
* „ „ elegans.	„ trifolia.
* „ apennina.	Catananche cœrulea.
„ blanda.	„ „ bicolor.
„ hortensis.	Caltha palustris fl. pl.
*Aquilegia cœrulea.	†Centaurea montana.
„ glandulosa.	* „ ruthenica.
„ chrysantha.	„ „ dealbata.
„ californica.	„ „ glastifolia.
†* „ selected hybrids.	* „ macrocephala.
*Asphodelus ramosus.	*Cimicifuga racemosa.
*Aster Thomsoni.	„ „ americana.
„ alpinus.	*Chrysanthemum latifolium.
„ „ albus.	†* „ „ maximum.
„ „ pyrenæus.	„ „ areticum.
* „ spectabilis.	*Chrysogonum virginianum.
* „ Amellus.	*Chelone obliqua.
* „ „ bessarabicus.	„ „ glabra.
* „ cordifolius.	„ „ Lyoni.
* „ versicolor.	Cnicus heterophyllus.
* „ undulatus.	Chrysobactron Hookeri.
* „ novæ angliæ.	Clematis recta.
„ lævis.	*Coreopsis lanceolata.
„ novi belgii.	„ „ tenuifolia.
„ corymbosus.	oCommelina cœlestis.

- Corydalis nobilis.
 *Coronilla iberica.
 Chrysocoma Linosyris.
 Delphinium formosum.
 0 " sinense.
 " nudicaule.
 †* " hybrid varieties.
 *Dietamnus Fraxinella.
 " " " var. alba.
 *Doronicum Harpur Crewe.
 " caucasicum.
 †*Dodecatheon Meadia.
 Dracocephalum Ruyschianum.
 *Echinops Ritro.
 " bannaticus.
 *Epimedium pinnatum.
 " violaceum.
 " rubrum.
 " macranthum.
 *Erigeron speciosus.
 " glabellus.
 " aurantiacus.
 " philadelphicus.
 " mucronatus.
 *Erodium Manescavi.
 " hymenodes.
 Eremurus.
 Euphorbia pilosa.
 *Eryngium Oliverianum.
 " giganteum.
 * " planum.
 * " alpinum.
 " Bourgati.
 Funkia Sieboldii.
 0 " grandiflora.
 † " ovata.
 †Fritillaria Meleagris.
 " latifolia.
 †c Gaillardia.
 *Galega officinalis alba.
 *Gillenia trifoliata.
 *Gentiana acaulis.
 * " aselepiadea.
 " " alba.
 " Andrewsii.
 * " septemfida.
 " verna.
 †*Geranium ibericum.
 * " armenum.
 " pratense fl. pl.
 * " Endressii.
 " lancastriense.
 " Wallichianum.
 *Germ chiloense (coccineum).
 Hacquetia Epipactis.
 *Helianthus multiflorus.
 * " " major.
 * " " fl. pl.
- Helianthus angustifolius.
 †* " rigidus.
 " lætiflorus.
 " giganteus.
 * " decapetalus.
 " tuberosus var.
 * " doronicoides.
 †*Heliopsis scabra.
 *Hieracium villosum.
 *Heuchera sanguinea.
 " micrantha.
 " Richardsonii.
 Helenium Hoopesii.
 * " autumnale.
 * " " var. pumilum.
 †*Hepatica (Anemone).
 *Hemerocallis flava.
 " fulva fl. pl.
 " Thunbergii.
 * " Sieboldii.
 " Dumortieri.
 Hypochæris maculata.
 Hypericum olympicum.
 *Inula glandulosa.
 " grandiflora.
 " ensifolia.
 " hirta.
 †*Iris sibirica.
 † " selected kinds.
 * " pallida.
 Jeffersonia diphylla.
 Lactuca perennis.
 Lathyrus (and Orbus).
 * " roseus.
 †* " vernus.
 † " luteus.
 " lathyroides.
 " hirsutus.
 0 " canescens.
 " cyaneus.
 0 " Sibthorpii.
 " rotundifolius.
 " latifolius.
 0 " " albus.
 Linum narbonense.
 * " flavum.
 " alpinum.
 Lindelophia spectabilis.
 †Lobelia (hybrids).
 *Lychnis chalconica.
 " " fl. pl.
 " Coronaria, hybrid.
 * " flos Jovis.
 " Haageana.
 * " viscaria fl. pl.
 * " " alba.
 *Lupinus nutkaensis.
 † " polyphyllus.

- Lupinus polyphyllus albus.
 Mertensia sibirica.
 †* " virginica.
 *Malva moschata alba.
 " alcea.
 †Mimulus cardinalis.
 †*Montbretia Pottsii.
 *Monarda didyma.
 Morina longifolia.
 Oenothera marginata.
 * " macrocarpa.
 * " Youngii.
 " linearis.
 Ononis rotundifolia.
 *Omphalodes verna.
 Ourisia coccinea.
 Orchis foliosa.
 †*Papaver bracteatum.
 * " pilosum.
 * " nudicaule.
 Pentstemon ovatus.
 " glaber.
 o " speciosus.
 " barbatus.
 *Phlox amoena.
 " stellaria.
 * " canadensis.
 " carolina.
 " glaberrima.
 † " setacea.
 †* " florists' varieties.
 †Physostegia virginica.
 †*Primula japonica.
 " cortusoides Sieboldii.
 † " acaulis, &c.
 † " denticulata, &c.
 Polygonum sphaerostachyum.
 " amplexicaule album.
 †*Polemonium coeruleum.
 " reptans.
 " humile.
 Potentilla nepalensis.
 † " atrosanguinea.
 † " florists' varieties.
 †Phyteuma (best varieties, names uncertain).
 Phygelius capensis.
 †Pulmonaria (selected forms).
 †Prunella grandiflora.
 * " rubra.
 Pyrethrum Willemotti.
 * " uliginosum.
 †* " roseum.
 " florists' varieties.
 Ranunculus Gouani fl. pl.
 " acris fl. pl.
 " amplexicaulis.
- Ranunculus aconitifolius.
 * " " fl. pl.
 *Rudbeckia speciosa.
 * " californica.
 " laciniata.
 " lævigata.
 " submontosa.
 o " purpurea.
 o " intermedia.
 " maxima.
 Rhaponticum cynaroides.
 oRomneya Coulteri.
 Senecio Doronicum.
 " macrophyllus.
 " pulcher.
 " japonicus.
 " spathulæfolius.
 †Sidalcea oregana.
 " candida.
 *Sedum spectabile.
 Silene Schafta.
 * " alpestris.
 Scabiosa caucasica.
 Silphium laciniatum.
 Sisyrinchium grandiflorum.
 *Spiræa Filipendula.
 * " " fl. pl.
 * " venusta.
 " palmata.
 * " " alba.
 * " " var. elegans.
 * " Aruncus.
 oStokesia cyanea.
 Thalictrum tuberosum.
 †* " aquilegiæfolium.
 † " minus (for foliage).
 *Tiarella cordifolia.
 Telekia speciosissima.
 †*Trollius europæus.
 †* " asiaticus.
 Tradescantia virginica.
 †*Veronica Teucrium.
 † " longifolia.
 * " " var. sessilis.
 † " gentianoides.
 " prostrata.
 †* " virginica.
 " incana.
 Veratrum nigrum.
 " viride.
 " album.
 †*Verbascum phœniceum.
 " nigrum var. album.
 " vernale (?).
 " olympicum.
 oZauschneria californica.

APPENDIX II.

DESIRABLE PLANTS REQUIRING SPECIAL SOIL OR TREATMENT.

Achillea Ptarmica.	Megasea.
<i>n</i> „ mongolica.	Anemone coronaria.
Meconopsis Wallichii.	Gypsophila paniculata.
„ nepalensis.	Cypripedium.
Hellebores.	Sanguinaria.
Hesperis (double Rockets).	Uvularia.
Tritoma.	Trillium.

LILIES SUITABLE FOR MIXED BORDERS.

Lilium bulbiferum.	Lilium pyrenaicum.
† „ croceum (including excellent hybrids, sold as umbellatum).	„ var. rubrum.
† „ colchicum monadelphum.	„ tigrinum.
„ testaceum.	„ chalcedonicum.
„ candidum.	„ pomponium.
† „ Martagon.	„ giganteum.
	„ pardalinum.
	o† „ elegans (varieties).

n Good for cutting, but too weedy for mixed borders.

CARNATION CONFERENCE.

JULY 22, 1890.

A CONFERENCE on Carnations was held at the Chiswick Gardens on Tuesday, July 22.

The Chair was taken at 2.30 P.M. by MARTIN R. SMITH, Esq., F.R.H.S., President of the Conference, who, in opening the proceedings, said :—

It is my privilege on opening these proceedings to make a few remarks, and I shall commence them by an apology for presuming to address you at all, possessing as I do but a mere amateurish knowledge of the subject upon which I am going to speak.

I am, however, a sincere lover of that most beautiful of our flowers—the Carnation—and I avail myself of my privilege to point out an error into which I believe the great growers of Carnations are falling, and that is, that I believe they are raising their plants from a pampered and weakly parent stock, and thus rendering them unfit to bear the vicissitudes of our severe English winters and springs.

Now and again a few beautiful, and at the same time thoroughly hardy, varieties are produced, such as Alice Ayres, Princess Alice, Paul Engleheart, and others ; but, out of the thousands of seedlings that are raised annually, how many of them are fit to stand the wet and cold of our winters ? Very few indeed ! and I maintain that practically it comes to this, that the modern Carnation is *not* a hardy plant.

No doubt the fault lies somewhat in the habit of the plant itself, which renders it intolerant of snow or continued wet, but the main fault is the consumptive tendencies of the plant itself. We ourselves are to blame for raising our Carnations so habitually under glass instead of in the open air, and being contented and satisfied with the beauty and colour and form with which we are rewarded.

What I maintain is that the same beauty of form and colour can be obtained in due time from varieties absolutely hardy.

Nevertheless it must be allowed that there are difficulties in

the successful growing of Carnations. You cannot stick them into the ground and leave them to take their chance; but my complaint is, that when you have done your best, you are so apt to meet with failure.

You order your plants from the grower, and I am sure there are many among my audience who will remember with what excitement and expectation they have awaited them. They arrive, not perhaps so sturdy as we hoped and expected to see them, but our hopes are by no means dashed, for we know what lovely flowers they will produce in the summer! Have we not seen them with our own eyes at the exhibitions of the previous year?

We prepare the soil for them with as much care as if it were the food of our own children; we select the choicest corner of our gardens for them, and in due time plant them out. With what result? The weather is perhaps unpropitious, and we see our cherished plants growing smaller instead of bigger, exchanging the beautiful blue-green of their grass for a sickly yellow, and in the end we get but a few wretched, half-starved blooms, which are no more like the flowers we saw at last year's exhibitions than is a Dog-rose to a well-grown Maréchal Niel.

Again I ask, with whom lies the fault? With the amateur? I do not think so. No doubt he may be blamed for attempting impossibilities; but when he has bestowed upon his plants all the attention and care in his power, I think he has some right to complain when he finds that his plants will only really thrive when grown under glass.

The sinners, I verily believe, are our great Carnation-growers, who in their natural desire to obtain beautiful flowers sacrifice stamina and constitution to beauty.

Now I should be both foolish and ungrateful if I did not here acknowledge the great debt we owe to these gentlemen for the work they have done. They have shown us to what excellence the Carnation may be brought—they have, by years of patient and enthusiastic labour, given us a standard to work up to—and the only fault I would presume to find is that I do not think they have taken the public sufficiently into their confidence, and that in their catalogues they have not drawn a sufficiently distinct line of demarcation between the hardy and tender varieties. I maintain that the greater proportion of modern Carnations

belong to the latter category, and the result is much disappointment and discouragement to the amateur. Indeed, I know several of my own friends who have "given up Carnations" on these grounds.

My own experience is, I am sorry to say, all in the same direction. I was only looking a few days since at some choice varieties I had this spring put into my borders, and if their aspect had not been indescribably ludicrous I could have cried over them!

And now what is to be done—what steps can we take towards a better result? I have to-day made a proposal to the Carnation Society, which I have reason to believe that they will accept, and which I hope may be productive of satisfactory results—and that is the establishment of a class at their exhibitions for flowers cut from plants wintered without protection and bloomed in the open border. The details I have of course left to them, but I have proposed to give twenty guineas a year for the next five years towards this purpose.

I know that several leading growers have given much attention to this matter, and have met with considerable success. Indeed we shall shortly hear a paper read upon this very subject by Mr. Dean, to which I shall listen with the greatest interest; but it is impossible to deny that it is useless to compete with blooms cut from the open border with those brought out under glass. The conditions are too unequal—and the public, gazing admiringly at the lovely flowers they see staged at our exhibitions, are unable to appreciate the humbler excellence of border-grown Carnations.

I believe and maintain that it is possible to raise a class of Carnations absolutely hardy which shall at the same time possess all the grace and beauty of Carnations grown under glass; but to do this it is abundantly clear that there must be no "coddling," and that the parent plants should be selected not only on account of their beauty, but mainly with reference to their hardiness of constitution. And, as a great means to this end, I would say emphatically to amateurs, *raise your own seed*.

You must buy your parent plants, for you can get ready to your hand what you might probably never succeed in raising for yourselves.

Select your parent plants from those which flourish best in

your soil and climate; cross them judiciously, do not over-feed or coddle them, and undoubtedly you will reap a rich reward.

Do not be satisfied with growing "trees" and "Malmaisons" under glass—anybody can do that—but apply yourselves to the more difficult task of raising for yourselves and for futurity a race of thoroughly hardy Carnations.

THE CARNATION FROM A BOTANICAL POINT OF VIEW.

By Mr. F. N. WILLIAMS, F.L.S.

HAVING been asked to say a few words on the subject of this exhibition, I propose to lay before you some facts concerning the botanical origin and history of the species from which our cultivated Pinks have been derived. I have to confess at the outset that I am afraid I know very little about Pinks from a horticultural point of view; I therefore leave that part of the subject to those better qualified to discuss it. One or more species were in cultivation in this country as early as the reign of Edward II., and were favourite garden flowers until the middle of the eighteenth century, when they seem to have gone very much out of fashion. Of recent years, however, their culture has been revived, and they have been again installed in their position as a favourite florists' flower.

As to the wild species, their number may be reckoned at present at rather under 250. I should say that nearly 1,000 supposed species have been described from the time of Linnæus; but this number has been considerably lessened by the process of reduction to varieties and forms, and by the disappearance of many specific names in the maze of synonymy. It is remarkable how frequently the same plant occurring in different localities has been recorded under several specific names, and fully described in almost the same words, for the confusion of subsequent workers and for adding to the cumbrousness of synonymy. I will first of all speak of Pinks in general, and then of the different species which have been selected for cultivation. The five principal species from which the cultivated forms are derived are *D. barbatus* (the Sweet-william); *D. deltoides* (the Maiden

Pink), the probable origin of the Early Red Pinks and the Pheasant's-eye Pinks; *D. plumarius* (the Common Pink), the origin of the White Double Pinks with deep-cut petals; *D. sinensis* (the Indian, or rather the China Pink); and last, and not least, *D. Caryophyllus*, the origin of the Clove Pink or Carnation, and its various forms, the Flakes, Bizarres, and Picotees.

The Pink was entirely unknown to the Greeks. According to Pliny it was known to the Romans as early as the reign of Augustus Cæsar, when it was discovered in that part of Spain which is now called the province of Biscay, at that time inhabited by the Cantabri. These people were subdued by Augustus in B.C. 19, and the plant was conveyed to Rome, where it was called "Cantabrica," after the name of the country whence it was procured. Turner, in his "Herball" of 1568 speaks of it as "Cantabrica Gelover," and from him we learn that it was then cultivated in our gardens, since he says: "The Gelovers are made so pleasant and swete with the labours and witt of man, and not by nature." *Caryophyllus* was the pseudo-generic term used for many of the species described by the pre-Linnean botanists, such as Ruellius, Dodoens, Tabernæmontanus, Jean Bauhin, Grisley, Cupani, Tournefort, and Seguiet. The derivation of the Linnean name for the genus—*Dianthus*—is from *dios anthos*, the divine flower, in allusion to the beauty and fragrance of some of the species. Another derivation, which is not generally accepted, is *di anthos*, a double flower. Haller* revived the pre-Linnean name of *Tunica* for the species, which as a morphological expression is preferable to *Dianthus*, referring as it does to the form of the calyx. This name, however, was ignored by Linnæus in his "Species Plantarum," the first edition of which was published in 1753, and in which many of the Linnean species are described. Adanson, however, retained Haller's name for the species. The English name of Pink has been long in use. Gerard, in 1597, speaks of "a wild creeping pink which groweth in our pastures neere about London." The word "pink" as the name of a colour is derived from the plant, and in its

* Dillenius and Haller used "Tunica" as a general name for all the Pinks, but Linnæus did not perpetuate either this or *Caryophyllus* or *Armeria* when he established the binomial system of nomenclature on its present basis.—ED.

original sense, as used by Shakspeare, means "an eye," or rather "a small eye." In Dutch *pinken*, or *pinkoogen*, is to twinkle with the eye, and in provincial German *pinkern* is to wink. The French name of *œillet* (diminutive of *œil*) also illustrates its etymology.

The geographical range of the genus *Dianthus* is considerable. It is a genus quite characteristic of temperate and sub-temperate climates. It has its headquarters in Europe and Western Asia. There are several species at the Cape; a few are Himalayan, Chinese, and Japanese; none reach Australia, New Zealand, or the Andes; and only one, a Siberian species, just touches the extreme north-western tip of the American continent. The genus is distributed throughout Europe, with the exception of Ireland and Iceland, more especially in the southern and central parts of the continent. The species most frequently occur on dry pastures in elevated localities with a calcareous soil, on mountain limestone and chalk cliffs, and meadows on the slopes of mountains exposed to the sun; never in marshy districts or in localities with a humid climate. For instance, the Carthusian Pink ascends to 1,000 or 1,500 metres on elevated plateaux, or until it finds a dry soil; below this elevation the mists are unfavourable to its growth.

I now come to the Sweet-william. The origin of this plant is *D. barbatus*, a species indigenous in France, Russia, the south of Europe, and Western Asia, and growing in dry fields and alpine pastures. What it wants in fragrance it supplies by masses of variegated blossoms in large and compact heads. It is mentioned by Dodoens in his "Kruydeboeck" (published in 1554) under the name of "Keykens," which means a nosegay or bunch of flowers. Turner does not mention the plant in his work of 1568, but Gerard mentions it as a common flower in the gardens of that period, commonly called "London Tuftes." This old herbalist is the first to call them Sweet-williams, and he also notices many varieties both with double and single flowers. He says: "We have in our London gardens a kind hereof, bearing most fine and pleasant white flowers, spotted very confusedly with reddish spots, which setteth forth the beauty thereof, and hath been taken of some to be the plant called of the later writers *Superba austriaca*, or the Pride of Austria." The specific name of *barbatus* is either on account of the barbed appearance of the

flower-heads, from the protruding awns of the bracts and floral leaves, or from the distinctly bearded condition of the petals. It was also figured and described by Paul de Reneaulme in 1611 under the name of *Thyrsis*, of which he says: "It is so called because it has flowers crowded together in the form of a thyrsus; recent writers call it *Armerius*, and in France it is known as *Armoiries*." The Sweet-william may be taken as the type of that sub-genus of Pinks in which the flowers are clustered and numerous.

The Maiden Pink, or *D. deltoides*, is the most widely distributed, as a native species, of all the Pinks, and occurs from Norway and Northern Russia, southward to North Africa and Bengal, and from Scotland eastward to Japan. It was first recorded by Lobel in 1581 by the name of "*Armeria sylvestris*," and Gerard in his "Herball" says: "There is a wild creeping pink which groweth in our pastures neere about London and in other places, but especially in the great field next to Deptford by the pathside as you go from Redriffe to Greenwich, which hath many small tender leaves shorter than any other of the wild pinks, set upon little tender stalks, which lie flat upon the ground, taking hold of the same in sundry places, whereby it greatly increaseth, whereupon grow little reddish flowers. The root is small, tough, and long lasting." An old English name for it is "Sop-in-wine." This pretty Pink is found on grassy slopes, roadsides, and dry pastures; it flourishes on soils of primitive or volcanic origin, *e.g.* in France on the syenite of the Vosges and the basalt of Auvergne, in Spain in the subalpine districts of the mountains of Castile, and in England on dry meadow-land in the eastern counties. As I noticed before, this plant is the origin of the Early Red Pinks.

The various forms of the Common Pink are derived from *D. plumarius*, which is indigenous in Piedmont, Austria, and Central Russia. It is naturalised on old walls in several places in this country—at Shalford in Surrey, on Haughmond Abbey in Shropshire, and on Conway Castle in Wales. This is probably the "piggesnie" of Chaucer, and is referred by Prior to one or more forms of cultivated Pinks. The wild Pink was cultivated in its improved double state in the time of Elizabeth; and Gerard is the first writer who calls them "Pinks or wild gilloflowers," from their being smaller than the Clove-gilloflower or

the Carnation, which was also known at that time in English gardens. Maddock, whose book on gardening was a standard work just a century ago, lays down as the criterion of a fine double Pink that "the stem should be strong, elastic, and erect, and not less than 12 inches high; the calyx rather smaller and shorter, but nearly similar in form and proportion to that of a carnation, as well as the formation of the flower, which should not be less than $2\frac{1}{2}$ inches in diameter; the petals should be large, broad, and substantial, and have very fine fringed or serrated edges, free from large, coarse, deep notches or indentures—in short, they approach nearest to perfection when the fringe on the edge is so fine as scarcely to be discernible; but it would be considered a very desirable object to obtain them perfectly rose-leaved, *i.e.* without any fringe at all; the broadest part of the lamina, or broad end of the petals, should be perfectly white and distinct from the eye, unless it be a laced Pink, *i.e.* ornamented by a continuation of the colour of the eye round it, bold, clean, and distinct, leaving a considerable proportion of white in the centre, perfectly free from any tinge or spot. The eye should consist of a bright or dark rich crimson, or purple, resembling velvet; but the nearer it approaches to black, the more it is esteemed; its proportion should be about equal to that of the white, that it may neither appear too large nor too small." Parkinson also enumerates many fine varieties that were favourites in the time of Charles I. This plant in its natural state may be considered as the type of the fimbriate species, though it is not so widely scattered as the *D. superbis*.

The next species is the China Pink, or *D. sinensis*, with which should be united the remarkably polymorphic *D. Sequieri* of the European flora. This plant was known to Tournefort, who calls it "*Caryophyllus sinensis supinus*." The seeds of this *Dianthus* were first sent from China to Paris by the French missionaries about the year 1705; but the double varieties of these flowers had not been seen before the year 1719, when they were frequent in some of the Paris gardens. Aiton notices the introduction of the China Pink into England as early as 1713; but Miller was certainly unacquainted with it in 1724, as he describes the Indian Pink as bearing yellow flowers only, and tells us that he takes the description from the written account of Mons. Liger; but as that author's work was published in 1703, two

years before the seeds had arrived from China, it is clear that the Indian Pink of Liger was a different plant.

Lastly, I will speak of the origin of the Carnation. The wild species from which the cultivated Carnations are derived is the *D. Caryophyllus* of Linnæus. This does not appear to have been known to the ancients, for we have no mention of it by any of the Roman poets; nor is it anywhere referred to by Pliny. We learn from Chaucer, who calls it "Clove gilofre" or "Clove girofle," that it was cultivated in this country as early as the reign of Edward III., and that it was used to give a spicy flavour to ale and wine. He writes in one of his poems:—

Ther springen herbes grete and smale,
The licoris and the setewale,
And many a clove gilofre,
————— to put in ale,
Whether it be moist or stale.

The next reference to it is by Manfredus de Monte Imperiali, who includes it in his group of "Tunici." Jacobus de Manlis indicated its habitat in Lombardy, growing under conditions which rendered its introduction very improbable, in a locality in which it is to be found also at the present time. It was first called "Carnation" by Lyte in his translation of Dodoens' work, which translation was published in 1578. Edmund Spenser calls the flower "Coronation," which is perhaps a corruption, and not, as some of the old books on gardening say, because they were much used on those and other festive occasions. In the "Shepherd's Calendar" we read:—

Bring hither the Pincke and purple Cullambine,
With Gelliflowres;
Bring Coronations, and Sops-in-wine,
Worn of paramours.

The flowers of this species were formerly employed in medicine. The old physicians considered them cordial, and administered the infusion in pestilential fevers and nervous complaints. They must, however, have dropped out of the pharmacopœia in Gerard's time, for he says: "They are not used in physick, but esteemed for their use in garlands and noseгаies. They are good to put into vinegar to give it a pleasant taste and gallant odour. The conserve made of the flowers of the Clove Gilloflower and sugar is exceeding cordiall, and wonderfully above measure doth comfort the heart, being eaten now and then." He also tells us

that he had a Carnation with yellow flowers, "the which," he says, "a worshipfull merchant of London, Master Nicholas Lete, procured from Poland, and gave me thereof for my garden, which before that time was never seene nor heard of in these countries." Parkinson enumerates by name 49 kinds of Carnations which were cultivated in the time of Charles I.; and the largest and principal kind of Carnation was then distinguished by the name of the Old English Carnation. Rea observes in his "Flora," published in 1665, that we had formerly many good kinds, but that few of them were then to be found in any of our gardens. "Of these Dutch flowers," he observes, "I have known more than 100 distinct varieties, by several names, all of them fair, large, and double flowers." In a later edition of Rea's "Flora" 360 good sorts of Carnations are enumerated. Forskål, the Swedish traveller, and a pupil of Linnæus, observed the species in cultivation in Arabia and Egypt, and in the gardens of Constantinople. Kämpfer and Thunberg found it a favourite flower in Japan, where it was called "Iammasiye." In the early part of the present century also Roxburgh and Graham observed it under cultivation in India.

Although the species is cultivated in all countries, its native habitat seems to be extremely limited, as it is only really wild in the N.W. of France, the N. of Italy, the littoral provinces of Austria, and the N.W. part of India. In the Floras of most of the European countries it is recorded, but only as a more or less naturalised species. Schultes named a Tyrolese form "*D. caryophylloides*" because he was unable to think that *D. Caryophyllus* could really be wild there. The typical form of the wild Carnation is cæspitose, glaucous, and glabrous in habit; the stems paniculately branched above, rarely quite simple, more or less angular below, jointed and tumid at the nodes; leaves linear, obtuse, recurved, very long, with the uppermost bracteform. Bracts of the calyx four, obovate, mucronate, coriaceous, and adpressed to the tube; calyx contracted above, teeth lanceolate, acuminate, 9-nerved. Petals dentate, beardless, contiguous, rose-coloured or white. Stamens equalling or overtopping the styles, capsule ovoid, and seeds peltate. In England the plant is naturalised on Rochester Castle, and possibly in a few other places.

CARNATIONS AND PICOTEES FOR EXHIBITION.

By Mr. HARRY TURNER, F.R.H.S.

As Mr. Williams has spoken of the Carnation from a botanical point of view, and we have two more papers to follow—one on Carnations and Picotees as town plants and one on Border Carnations—I propose to confine the few remarks I have to make strictly to Exhibition Carnations, and the first thought that naturally arises is how to grow Carnations for exhibition, and with your permission I shall endeavour to give you a few hints on cultivation. In the first place, Carnations for exhibition should always be grown in *pots*. Plants which are grown in the ground are subject to canker and disease, and are not so easily under command at the time of flowering. I think, then, the best period to commence this paper is when the layer is taken from the stool—the end of September. The layer should be potted either singly (if a strong grower) or in pairs (if a medium or weak grower) into $2\frac{1}{2}$ - or $3\frac{1}{2}$ -inch pots, the soil used on this occasion not being too light, and the plants potted firmly. The plants should be placed in a cold frame and kept close for a few days after potting. Should the sun become very powerful, they should be lightly shaded, and sprinkled overhead night and morning. Should any plants be found to be shy-rooted when taken off the stools, they should be placed in gentle bottom-heat. The plants will require to have abundance of air day and night, the lights being entirely removed during the day, but they should be sheltered from very heavy rains. Keep the plants clean during the winter by removing all the decayed foliage, and lightly stir the top of the soil. Plenty of air and a judicious use of the watering-pot will keep away the dreaded spot. The Carnation being thoroughly hardy, a little dry frost will do them no harm; but should excessive frost set in, a mat or any other slight covering will be of benefit to them.

We now come to the busy and critical time of the year in the cultivation of the Carnation for exhibition, viz. March (in speaking of the cultivation of the Carnation only throughout this paper, its companion the Picotee is always included); and supposing that the soil (of which I shall give a description later on)

has been properly mixed or prepared some months previously, and protected from heavy rains, but occasionally turned during bright, frosty weather, the important operation of potting the plants into their flowering pots will have to be done. The time of potting will depend upon the weather and the resources of the grower to shelter the plants after potting, the middle of the month being the best time if the weather be favourable. The plants on being potted should be protected overhead with glass, and the pots stood upon wooden strips or ashes on gravel which has been thoroughly drained, the pots best suited to grow exhibition flowers being 8 inches for a pair of plants. Smaller or larger pots may be used according to the growth of the variety, one very important point being not to overpot any variety, and another most important one to put in *all* the plants firmly.

The soil to be used in potting the above should consist of three parts fibrous loam and one part old manure, with a sprinkling of coarse silver-sand and bone-dust, the loam having been carefully looked over to find any wireworms. Cover the hole at the bottom of the pot with an oyster-shell, and at least 2 inches of clean broken crocks should be at the bottom of the pot, and then some fibre from the loam and a few pieces of charcoal.

The plants will now soon throw up their flower-stems, and attention should be given to secure them to some neat sticks, and as the season advances carefully watch for any attack of green-fly, and wash off with a solution of soft-soap and quassia or tobacco; the powder of the latter is very effective if applied after a shower, or the plants sprinkled overhead before applying it. The plants should now be top-dressed with some well-decayed manure, or manure and leaf-mould which has been used the previous season to make a hot-bed, a little of the soil on the surface being removed and the surface stirred before applying it. Should the weather be bright and hot, sprinkle the plants overhead night and morning. The leading shoots will now require disbudding, and although there is no general rule to guide the grower, the usual method is to leave the crown bud and two side buds about the third or fourth joint from the top bud, removing one of the side buds later on, when the grower can see which is the most promising, and will also bloom about the time it is required for exhibition. In disbudding, very much

depends upon the character of each variety, and an exceptionally good grower might have four or five buds left until they are opening, and then remove one or two of the worst; while a weak grower should be disbudded to the most promising bud. We now come to the time when the plants should be moved to some kind of shelter to open their flowers. This should not be delayed after the buds commence to open, or the thrip, green-fly, and rain will spoil every flower. The thrip this season has been very troublesome, and the rain getting into the buds after the thrip has been at work, it has ruined many flowers, so that it is quite necessary that the plants should be housed before the buds commence to open. It is advisable to give the plants two or three smokings with tobacco-paper as soon as housed to kill any insects on them. As the buds swell, a little weak manure-water may be given once or twice a week, and the buds should be tied to prevent the calyx from splitting down, which would spoil any flower for exhibition purposes. The best material for tying the buds is raffia, although small elastic bands are quickly placed over the buds and look very neat. While the buds are opening, sprinkle the plants night and morning, and give all the air possible. Carefully keep all bees out of the house, for if a flower becomes impregnated it immediately closes. Shade the house if the sun be very powerful, and discontinue sprinkling when the flowers have opened. The flowers which appear most promising for exhibition should have a split card placed behind the guard petals and a thin back card to keep it in position. This will keep the guard petals from reflexing too much, and save the time of the exhibitor on the morning of the show, as the flowers will then not require so much time in dressing. The flowers intended for exhibition may be cut and dressed the day previously.

I may here say a few words on dressing flowers for exhibition, which some condemn and describe its operation as a mutilation of the flower. In my opinion, dressing a flower is an operation which improves the appearance and makes the flower more attractive to the eye. It simply removes any malformed or faulty petals, and arranges the flower so that the beauty of each petal can be seen at a glance. Overdressing is to be condemned; by overdressing I mean removing so many petals that a flower looks loose and hollow-centred. The recognised method of exhi-

biting flowers on cards is essential to the exhibitor in taking his flowers to the show in the best possible condition, and also the white cards are a contrast to the high colours in the Carnation, and therefore bring it out to greater perfection on the exhibition table.

I might here describe the chief points or merits which constitute a show flower. The outline should be circular, the colours or markings bright and clearly defined, and, in a Carnation, running from the edge of the petal to the base; the petal broad and slightly cupped, of good substance; the white to be quite pure, without any spots or bars, and the markings to be distinct and bright.

The Carnation is divided into various classes for exhibition purposes—viz. Scarlet Bizarres, Crimson Bizarres, Pink and Purple Bizarres, Purple Flakes, Scarlet Flakes, and Rose Flakes. The Bizarres should consist of three colours and the Flakes of two. I shall now pass to a description of the Bizarres, the first of which are the

SCARLET BIZARRES.

This is a very attractive class, and the colours which constitute a Scarlet Bizarre should be bright scarlet markings, with stripes of maroon and white on each petal. The oldest variety in this class now in cultivation is Admiral Curzon, which was raised nearly fifty years since, and is still to be seen on the exhibition table; the best varieties of the present day are Arthur Medhurst, James Mackintosh, Robert Houlgrave, Robert Lord, and George.

CRIMSON BIZARRES.

This class has the richest markings of the whole section, the colours of which should be bright crimson striped with other shades of colour and white. Amongst the oldest flowers and still in circulation we have Lord Milton, over fifty years old. The most prominent now grown for exhibition are Master Fred, Harrison Weir, and Rifleman.

PINK AND PURPLE BIZARRES.

The Pink and Purple Bizarres are very chaste, one variety, Sarah Payne, a very old one, still retaining its excellence, although the petals are very often much reflexed, or what florists

term "saddle." The colours in this section should be pink, purple, and white. Amongst the most prominent varieties are William Skirving, James Taylor, Mrs. Barlow, Squire Llewellyn, Sir G. Wolseley, and H. K. Mayor.

We now come to the Flakes, which consist only of two colours, viz. purple and white, scarlet and white, and rose and white.

PURPLE FLAKES.

The Purple Flakes are a very beautiful class, and add considerable variety to a stand of flowers, one of the oldest in the class being Millwood's Premier, which has been in cultivation over fifty years. Another flower, called Sporting Lass, is a sport from the Pink and Purple Bizarre called Sarah Payne. The best now in cultivation are Dr. Foster, Florence Nightingale, and James Douglas.

SCARLET FLAKES.

This is a very attractive class, the scarlet stripes on the white ground making the flower very conspicuous; the best flowers of the present day are Matador, Flirt, Sportsman—an old variety, a sport from the old Scarlet Bizarre called Admiral Curzon. The other well-known varieties are John Ball, Clipper, and Henry Cannell.

ROSE FLAKES.

A very beautiful class, one of the best being Sybil, which, when "run" into a rose-self, is a very beautiful flower. Amongst the best are Thalia, John Keet, Jessica, and James Merryweather, a flower raised twenty-five years since.

CARNATIONS RUNNING.

Carnations "running," *i.e.* the flower running into a self-colour, or the colours becoming suffused and having no white. This running of the colours has puzzled the florist from the very earliest days, and no solution of the problem has yet been found to prevent colours from running, even if grown in poor, medium, or rich soils; but I would not advise any cultivator to propagate from run plants, as it is seldom or ever the flower returns to its normal state. Some flowers, however, are very beautiful in a run state, such as Sybil, run into a self or into a fancy.

There are many diseases and insects which trouble the grower, but the evils which attack them may be very much diminished if the grower always keep his plants in pots. Pot culture keeps them healthy, and they are much more under command from the weather than if grown in the open borders. Plants for exhibition should certainly be grown in pots.

PICOTEES.

We now come to the Carnation's companion, the Picotee, which is divided into various classes, according to the depth and colour of the markings on the edge of the petal, viz. Red Edge, Purple Edge, Rose Edge, and Scarlet Edge; these are again divided into heavy, medium, and light edges in each class.

The heavy-edged flowers should have a pure white ground, and the edges should be heavy, even, and distinct, without any spot or bar on the white ground; the light-edged flowers should have a thin wire edge on the outside of the petal, and no other marking whatever. There are also medium-edged flowers between the above. The improvement made in the Picotee during the last forty years has been most marked, and scarcely a flower grown then is now retained in any collection.

HEAVY RED.

Amongst the best are Brunette, Dr. Epps, J. B. Bryant, and Princess of Wales.

LIGHT RED.

Mrs. Gorton, Thomas William, and Mrs. Bower.

HEAVY PURPLE.

Muriel, Mrs. Chancellor, Zerlina, and Norfolk Beauty.

LIGHT PURPLE.

Nymph, Mrs. Nicholay, Ann Lord, and Baroness Burdett-Coutts.

HEAVY ROSE AND SCARLET.

Fanny Helen, Edith D'Ombraïn, Mrs. Payne, Mrs. Sharp, and Duchess.

LIGHT ROSE AND SCARLET.

Favourite, Ethel, Nellie, and Lucy.

YELLOW PICOTEES.

The improvement made in this section during the last few years has been very great. The first of any note was Prince of Orange, raised by Mr. Perkins, of Leamington, and from this many fine varieties were raised in 1879 in the Royal Nurseries, for example, Princess Beatrice, Mrs. Cavell, Harlequin, Lightning, Flavius, Mrs. Coleman, Alice Waite, Eleanor, Ne Plus Ultra, Bullion, and many others which are still in cultivation. Nothing further of much note was brought out until Mr. Douglas raised a very fine batch in 1885, which were a very great stride over those previously in cultivation. These were: Agnes Chambers, Almira, Annie Douglas, Colonial Beauty, Dorothy, and Terra Cotta. Mr. Douglas again exhibited several new varieties last year, one of which, Remembrance, is a great advance on former varieties; and he will no doubt continue to improve on the varieties he has already introduced.

Mr. TURNER, in reply to a question by Mr. Martin Smith, said that when once a seedling had "run" it always maintained that character afterwards.

Mr. CANNELL said his experience was the same.

THE CARNATION AS A TOWN FLOWER.

By Mr. MARTIN ROWAN.

FOR those like myself who have followed their gardening hobbies in a London suburb during the last thirty years, the deterioration of climate, which has caused one favourite after another to drop out of the list of things easy to grow, is no doubt a matter which raises many regretful memories. But if the Queen of Flowers has been almost scared away, while most of our fine perennials refuse to dwell with us, and dainty creatures like our Hepaticas and Gentians are quite a dream of the past, there are, on the other hand, so many things of first importance and excellence still left to us that we may well lay aside our regrets

and leave the smoke-fiend to wonder at his moderation towards us. If the townsman cannot, like his country cousin, go into his garden and roam among countless species from China to Peru, his interest and pleasure are none the less real and keen because centred on fewer subjects, many of them being of the most marked individuality and character.

Quite in the fore-front among our garden favourites as a townsman's flower is the subject of the present paper. In its origin a mountain plant, to which pure air, and plenty of it, might be expected to be a first necessity, its patient endurance of the smoke-laden atmosphere of our great towns is most remarkable. The collection of Messrs. Veitch at Chelsea and the Cloves growing and flowering luxuriantly on the Embankment gardens at Charing Cross will occur in this connection to many lovers of the flower. In the still more trying situations of small town gardens the Carnation is equally at home. At Sheffield, in one of the worst climates conceivable, in the midst of factories of every description, Mr. Simonite has raised some of the most exquisite flowers we possess; and all Mr. Dodwell's finest seedlings, up to the time of his removal to Oxford eight years ago, were raised in a small garden within ten minutes' ride of Victoria Station. Indeed the bulk of our exhibitors at the three great shows in London, Oxford, and Manchester are amateurs with small gardens, working under all the disadvantages of adverse climate, cramped space, and scant leisure snatched from busy occupations of every sort.

Now the Carnation is propagated by seed and by cuttings, or "pipings," as they are termed. These latter are usually taken from the plant early in July. It is also propagated from layers, which are put down about the latter end of July or beginning of August, as the plant is going out of flower. But, in detailing briefly the culture of the plant, I shall assume the case of one taking it up for the first time; and as he would presumably desire to set out with varieties of known excellence, his best course would be to obtain plants from the nurseryman in the autumn, say early in October, at which time the layers put down in July have become rooted and ready to detach from the old plants. Having got in his plants, his next consideration will be how they shall be wintered. There are those who will tell him that the Carnation being by nature a thoroughly hardy plant, it may, and in fact ought to be,

planted out to go through the winter in the open ground. Then it may equally happen that he will find some friend who will recount his sad experience of having so treated his plants, and lost them nearly all. These apparent contradictions are not difficult to reconcile. The Carnation is indeed a thoroughly hardy plant in an adult stage, but it is necessary to bear in mind that the layers which we take off in October are scarcely yet developed, as they have not sufficient root-power to healthily dispose of all the moisture which our autumns and winters bring with them ; and when that is the case the plants get into a congested state and die off, not from cold as a primary cause, but from disease. Very well rooted layers may go through wet autumns and winters safely, and when these seasons are comparatively dry they are pretty sure to do so even on heavy soil.

I am informed that most of the Newcastle growers plant their collections out in beds in the autumn, as do also some of the Lancashire people ; but this is not a wise course to pursue in localities where the soil is wet and badly drained. On the other hand, if the layers be left in the ground undetached from the parent plant, they will usually go through the winter with impunity.

If we desire to put the hardiness of the Carnation to the test, we should take, not the newly struck layer, but the seedling, which raised in the spring is by the autumn a fairly developed plant. Seedling plants, even of the choicest exhibition varieties, are always wintered in the open ground.

Dealing, then, with our autumn-struck plants, the safe general course to pursue is to pot them, and winter them in a cold frame. The soil suitable at this stage is light loam, with about a fifth part of good, sweet leaf-mould and a little coarse sharp silver-sand. The leaf-mould is not a necessity, and, unless it can be got sweet and pure as it comes from a wood, it may be better dispensed with. The plants should be potted singly in $2\frac{1}{2}$ - or 3-inch pots, according to their size, or two small ones may be potted together. They should be stood upon ashes in a frame, and the lights should be closed down upon them for five or six days, while fresh roots are being formed. The plants may then receive a watering, and air may be given gradually till they are seen to be establishing themselves, and in about three weeks' time the lights may be removed altogether if the weather be fine.

Another mode of wintering is that of bedding the plants in the frames. It is, of course, only applicable to plants designed for the open ground, as for pot culture the previous establishment of the plant in a small pot is a necessity. Growing myself the main stock for pot culture, and turning the surplus beyond what is wanted for the stage into the borders, I have never myself used this method; but it is practised by many, and where there are large numbers of plants intended for the open ground it is the means of a great saving of labour.

But, whichever mode is adopted, it is essential to bear in mind that the protection of the frame is designed, not against cold, but against the soaking rains of autumn and winter with which these young plants may not at this stage of their existence have capacity to deal. In its alpine home the plant would hibernate under snow—the cold frame of nature—to remain there at an equable temperature in a state of quiescence till Nature in her own time lifted the covering and awakened the plant to activity.

Cold, therefore, not being the enemy we have to contend with, the plants must have plenty of air day and night all through the winter. If very harsh winds prevail, the lights should be tilted so as to admit the air from the leeward side. All the cultural attention the plants will need will be the looking after them for water, which they will want occasionally if the weather be open. It should be given in the morning and without wetting the foliage. They should also be watched for green-fly and for any sign of maggot.

By February the little pots will be full of roots in the case of the more vigorous varieties, and, if the weather should be genial, any showers that fall will be beneficial to the plants.

In March—the earlier the better if the weather permit—they may, if intended simply for garden culture, be planted out where they are to bloom.

As to soil, it has been said in a general way that any soil that will grow wheat well will grow a Carnation well. A friend who once complained to me that he thought the soil in his locality—a good wheat district—unsuitable for Carnations was not a little surprised at hearing that my first-prize six Carnations at South Kensington that summer had been grown in soil taken from a wheat-field in his own neighbourhood.

From this it will be seen that the Carnation likes a rather stiff, loamy soil ; and though it will scarcely disdain any soil, the nearer we approach its natural requirements the more likely we are to do it justice.

By the end of April or the beginning of May the plants will begin to throw up the main stem, or to "spindle," as it is termed, and will soon afterwards want staking, and also tying as they grow on. Green-fly and spittle-fly must be watched for and promptly destroyed.

Early in June a surface dressing of rotted manure will be found serviceable in promoting vigorous growth in the plants. From this time to the period of flowering—in ordinary seasons about July 20 in the south—they will want little further attention beyond the tying, and watching for the attacks of green-fly and the ordinary garden enemies.

Towards the latter end of July the plants will be ready to layer, and the layers will be rooted by the end of September or beginning of October, when they may be taken off.

Such in brief is the culture of the Carnation as a garden flower.

But in addition to his plants in the borders, where he will naturally have regard to quantity as much as to the quality of the bloom, the amateur may become sufficiently interested in Carnations to desire to have a few flowers brought up to exhibition form, whether he intend them for exhibition or simply for his own enjoyment.

For the production of flowers for exhibition the plants are usually grown on in pots. Not that they could not be trusted to give us show blooms in the beds or borders, for, as a matter of fact, the Newcastle and many other northern exhibitors grow their plants in this way, and there are none more exacting in the quality of their flowers. The system of pot-culture as generally followed is one mainly of convenience, whereby the exhibitor may have his plants under more complete control than they could be in the borders—more especially at the time of blooming in July, which is more often than not a period of rain and storm.

Some good people are occasionally much exercised that Carnations should be grown in pots, which it is thought must needs be a system of "coddling." This is an utter mistake, but it is worth noticing, as it reflects an idea to some extent

prevalent that our exhibition sorts need to be treated as tender plants, a notion from which the beginner, if he entertain it, should be disabused at the outset.

People are accustomed to see the Tree and Malmaison sorts growing under glass for the sake of continuous or early flowering, and they also see the exhibition sorts—probably at the only time they ever see them—when they have been brought in from the stage outside to flower in the same way, and to those unfamiliar with the various forms of Carnations the idea of artificial treatment is suggested all round.

Of course the objects sought with these diverse forms of the flower are quite distinct. We desire to exhibit Carnations at the plant's natural season of flowering in the highest state of development to which culture can bring it, and plants in pots for exhibition are grown in the open air, and are just as much dependent on seasonal influences as those in the borders. The simple proof of this is seen in the fact that plants in the borders flower at just the same time as the same varieties in pots on the stage.

As illustrative of the above remarks, I may mention that a friend to whom I had given some plants for his garden surprised me by producing flowers he had cut from them in the middle of June in the very backward season of two years ago. It appeared that his gardener, either through my recommendation as to winter treatment not having reached him or acting under the not uncommon idea to which I have referred, wintered the plants up to March or April in a cool vinery from which the frost was just excluded, with the result that the flowers were premature, and comparatively poor, in a season remarkable for its lateness and the fine quality of the bloom.

After wintering the plants, therefore, as previously detailed, they will be ready by the latter end of February or beginning of March for potting on in the large pots in which they are to bloom. Many persons, indeed, do this early in February, but this being with me an inconvenient time I am satisfied to begin the work as soon as I can in March, and to get it finished by the beginning of April.

The compost I use is good yellow fibrous loam three-fourths, and for the remaining fourth a mixture in equal parts of rotted manure and leaf-mould. To this is added a little coarse silver-

sand and some charcoal broken up to the size of peas and shaken over the compost to keep the whole sweet. The loam may be either sifted or broken up, but must be looked over very carefully in any case for wireworms.

The most forward plants should be taken for potting first, and, as the plants vary in size and vigour, it is necessary to use more than one size pot for them. For the largest and most vigorous 9-inch, for the average 8-inch, and for smaller growers 7-inch pots are the most suitable—two plants being placed in each. Varieties which are scarce with us should be potted singly in 5- or 6-inch pots, as their size and root-development may demand. The pots should be well drained and the plants potted rather firmly. If the weather be calm and dry I place them at once on the stage where they are to bloom. If squally and rainy I keep them close in the frames for a week or ten days, while they are establishing themselves, and remove them in batches as they have been done to the stage.

Up to the end of May the plants will need only the same attention as to staking and tying and watching for insect pests as those in the borders. Green-fly will need to be specially watched for, and may be removed with a camel-hair brush. If the plants should be much infested, as in common with almost everything else they were this season, it will be necessary to dust them with tobacco-powder, which must be syringed off again. The soil should be stirred occasionally, as it may have got hardened or green through rain or watering, the opportunity being chosen for this when it has become dry. A top-dressing of equal parts of loam, leaf-mould, and rotted manure is commonly given at this time, but I do not myself regard it as a very essential matter; and as it takes time to go through the whole collection, I have never practised it except in a very partial way.

Only the main stem of each plant is allowed to go up for bloom, the lateral flowering shoots being stopped. Disbudding should be commenced as soon as the buds can be taken between the finger and thumb. Usually only two are left on the plant, but in the case of some very vigorous varieties there may remain three. These are the crown or main bud, of course, and the third and fourth from the top.

Many of the buds when they have swelled will need tying

with a thin strip of matting to prevent their bursting. In hot weather syringing up to the time the buds are showing colour is very beneficial in keeping down thrips, invigorating the plants, and inducing gradual and perfect opening of the buds.

By the first or second week of July, according to the season, the greater number will be showing colour, and will then need to be protected from injury by sun or rain.

Where the stock is not large, or where stock and garden are both large, a glass house affords, without doubt, the most convenient quarters for flowering—a free circulation of air and shading from hot sun being matters of course. Where, however, as in my own case, the stock is comparatively large and the garden relatively small, the erection of a glass house large enough to take all the plants would be too great a sacrifice of garden space. By putting up a light but sufficiently strong woodwork over the stage, and a covering of very good calico stout enough to resist heavy rain while admitting light freely, a glass house may be dispensed with. Such a simple structure I have found sufficient to resist the heavy rain-storms of the last three seasons, without the least injury resulting to the blooms. The flowers, even in the cold summer of 1888, developed perfectly under this protection, both as to colour and form—the first-prize twelve Carnations and twelve Picotees at Oxford that year, and at Westminster last year, and the first twelve Carnations and first six Picotees at Chiswick this year having been all flowered in this way.

Opportunity should be taken in the early morning before the sun comes on, and again in the evening as soon as it has gone off, to lift the awning, so as to give both plants and bloom the full benefit of the air, and in warm, settled weather I keep it off at night altogether.

Seed should be saved by careful fertilisation of the best varieties in each class of Carnations and Picotees. It should be sown about the latter end of March or beginning of April in pans, which should be placed in a cold frame. It will germinate in about ten days or a fortnight. The young plants are pricked out in boxes soon after they show the second leaf, and early in June are planted in the beds where they are to bloom the following year.

Having dealt so far with purely cultural details, it may be

worth while to briefly note some of the characteristics of the different sections of the flower.

The Bizarres have two colours disposed longitudinally on a white ground, and are subdivided according to the leading colours into scarlet, crimson, and pink-and-purple Bizarres.

The Flakes have one colour, also laid lengthwise on a white ground, and are classed into scarlet, rose, and purple.

The Picotees have the colour placed upon the edge, and are classed as red, purple, rose, and scarlet edges, and subdivided, according to the depth of the edge, into heavy, medium, and light edges of these colours.

The above disposes of the flowers with distinctive markings on white grounds, and these are ordinarily termed the "class flowers."

A wide section is embraced by the term Fancies, which takes in all the flowers with markings on coloured grounds, and also those too indistinctly or indefinitely marked on white grounds to entitle them to a place among the class flowers.

Most familiar of all are the Sells, the flowers of one colour, embracing almost every tint but blue.

To those little acquainted with our "class flowers" as they are called, it may seem somewhat strange that we should call the Picotee a section of the Carnation. The word "Picotee," meaning "pricked," "spritted" or spotted, describes the original type of flower from which first our Bizarres and Flakes, and much later—indeed within living memory—our present all but faultless Picotees have been obtained. The florists' Picotee of eighty years ago may be seen in the illustration given by Maddock of "the flower of a fine variegated pink Picotee" in his work on florists' flowers published in 1810. The original form of the flower is familiar enough among those resulting from any packet of Continental seed purchased to-day.

The actual process of evolution by which our Bizarre and Flake Carnations and our modern Picotees have been got by select seeding from the pricked and spotted flower, according as the tendency has been shown to longitudinal or marginal marking, may be seen going on now in the case of the yellow-ground flowers, which, till lately neglected by raisers, will be made in time, out of the same spritted and spotted forms, to yield us Bizarres and Flakes, and edged Picotees, as has already been done in the case of the white-grounds.

The yellow-ground flowers, to which allusion has just been made, must be taken as a race apart from all the rest. The richly varied and picturesque character of these flowers makes them general favourites, but coming originally from the South of Europe they are impatient of our cold, wet summers. Dry cold does not appear to affect them, and I winter them in the same way as the rest of the stock. After a long winter, followed, as in 1887, by a long, dry summer, many of them will grow like willows, whether in pots or borders; but when the summer season is cold and wet for a couple of months together, as in 1888, growth is either completely checked or rendered unsound for the following season.

Some sorts, like Bell Halliday and Edith, will go through it quite unaffected, but, as a rule, the yellow flowers, as we have hitherto known them, need some protection against long-continued wet weather, if vigorous and healthy growth is to be maintained.

Latterly, however, it is a pleasure to know that raisers have succeeded in getting something like a new race of yellow-grounds which will give us, along with higher quality, a greater adaptability to our trying climate.

Of the various sections of the flower, the Selfs are best known, and are those which are most commonly seen in our gardens. Besides the simple charm natural to the unicoloured flower, they have also a capacity for broad effect which exhibits them to great advantage when grown in large groups of a sort. Our town gardens do not, as a rule, offer much scope for display of this kind, but it might be tried in our parks with the happiest results.

The class flowers—the Bizarres and Flakes and Picotees—have hitherto remained but little known beyond the circle of the florist, but the area of their cultivation appears to be widening considerably of late, owing, without doubt, to the exhibitions of our three leading societies. These are the florists' flowers, representing as they do the highest qualities of the Carnation in the direction of refinement, and of the seemingly little compatible qualities of strongly marked individuality and wide variety. One sometimes sees the statement made—only, of course, by those without knowledge of the flowers—of Scarlet Flakes so formal as to have every petal marked exactly alike. Such a

flower, while even less beautiful, is happily as apocryphal as the griffin, and could have been seen, if at all, only in a nightmare. It is opposed to the chief characteristic, to the very genius of the whole Carnation tribe, and of this section of it more than any other—that of variety. Not only is the variation great as between the parent and the seedling, but the proved and named variety, while preserving always unmistakable individuality of feature, is never from one season to another exactly the same. And, be the season what it may, there are always some varieties, and even entire classes of the flower, which seem by their display of exceptional high quality, to be exactly suited by it. Two years ago, when the winter in summer made us fear for the quality of our flowers, to the surprise and delight of all of us we were rewarded with blooms of unequalled richness and refinement.

The florist every year, as the season of the bloom approaches, is on the tiptoe of expectation as to how the flowers will come. Many a disappointment has he, but many a more than equal surprise and joy to set against it.

In conclusion, I would advise every true lover of the Carnation not to restrict himself in any narrow way to any one section of the flowers. Let him take the goods the gods provide him. Increasing knowledge will bring with it the truest appreciation of the relative merits of each and ever-increasing admiration for all.

Subjoined is a list of some of the best varieties of Carnations in the different sections. All are good growers except the few marked with an asterisk, which are given with the rest on account of the well-known merits of their flowers.

BIZARRES AND FLAKES.

<i>Scarlet Bizarres.</i>	<i>Pink & Purple Bizarres.</i>	<i>Rose Flakes.</i>
Admiral Curzon.*	Harrison Weir.	Jessica.
Fred.	Mrs. Barlow.	John Keet.
Mars.	Sarah Payne.	Rob Roy.
Robert Houlgrave.	Unexpected.*	Thalia.
Robert Lord.	<i>Scarlet Flakes.</i>	<i>Purple Flakes.</i>
<i>Crimson Bizarres.</i>	Alisemonde.	Florence Nightingale.
Edward Rowan.	Clipper.	Gordon Lewis (Dodwell).
J. D. Hextall.	Matador.	James Douglas.
Master Fred.*	Sportsman.	Mayor of Nottingham.
Rifleman.		

PICOTEES.

<i>Heavy Red Edge.</i>	<i>Heavy Rose and Scarlet Edge.</i>	<i>Heavy Purple Edge.</i>
Brunette.	Edith D'Ombrain.	Amy Robsart (Dodwell).
J. B. Bryant.	Mrs. Payne.	Mrs. Chancellor.
Mrs. Dodwell.	Mrs. Sharp.	Muriel.*
Master Norman.	Royal Visit.	
		<i>Light Purple Edge.</i>
<i>Light Red Edge.</i>	<i>Light Rose and Scarlet Edge.</i>	Clara Penson.
Emily.	Favourite.	Juliette.
Mrs. Gorton.	Miss Lee.	Mary.*
Thomas William.	Mrs. Ricardo.	Nymph.
Violet Douglas.	Nellie.	

SELFS.

<i>White.</i>	<i>Pink.</i>	<i>Salmon.</i>
Bride (Hodges').	Celia.	Eveline (Dodwell).
Emma Lakin.	Lady Agnes.	Mrs. Vernon Harcourt (Dodwell).
Mrs. Muir.	<i>Maroon.</i>	Wm. Harding (Dodwell).
W. P. Milner.	Florizel (Dodwell).	
White Clove.	Maestro (do.).	<i>Purple.</i>
	The Old Clove.	Imperator (Dodwell).
<i>Blush.</i>	<i>Yellow.</i>	Neptune (do.).
Comte de Chambord.	Bell Halliday.	Purple Emperor.
Comtesse de Paris.	Edith.	Purple Clove.
Governor.	Germania.	
	Will Threlfall.	<i>Scarlet.</i>
<i>Rose.</i>	<i>Buff.</i>	A. L. Roland.
John Barnett.	Amber.	Joe Willet.
Mrs. George (Dodwell).	Florence.	Murillo.
Rose Celestial.	Mrs. Reynolds Hole.	Scarlet Gem.

YELLOW-GROUND CARNATIONS AND PICOTEES.

Agnes Chambers.	Dodwell's Seedling, No. 574.	Prince of Orange.
Almira.	Do. No. 166.	Rachel.
Alfred Grey.	Do. No. 614.	Terra Cotta.
Colonial Beauty.		

THE CARNATION AS A BORDER FLOWER.

By Mr. RICHARD DEAN, F.R.H.S.

I HAVE been asked to treat of the Carnation as a border flower, as everybody's flower, in fact—the floral pet of all who love the sweet-smelling blossoms of the old Gillyflower of our English gardens. It can appeal to our patriotism with a kind of pride of race, and it compels the homage of the heart and senses to a degree perhaps shared only by the Rose. Let the rosarian

extol his favourite flower, as he doffs his cap and shouts *Floreat Regina Florum!* It is worthy of his highest devotion and service. We who love the Carnation maintain that if any flower can be said to be the idol of the masses it is the Carnation—in whose honour we are holding high festival to-day. And it can boast of aristocratic admirers also, for did not Sarah, Duchess of Marlborough, display great partiality for the Carnation? The gossip in the society papers of her day declared that she had every year about two hundred pots of them, esteeming them as her successor at Blenheim does in these days his Orchids; and she is reported as frequently saying that nothing gave her so much pleasure as the sight of her Carnations in full bloom, which she preferred to all the greenhouse plants in her possession. And in our day the Malmaison and other Carnations repose as button-holes upon the breast of many a one who can prefer the claim of long descent, and whose blood is as blue as the most regal Delphinium. We who are to-day attending the *levée* the Carnation holds in the historic gardens at Chiswick justify our laudation of it on the grounds that it is popular with all classes, that it is easily cultivated, that it abundantly repays good culture, that to beauty of form and expression it adds a delightful variation in character, that it combines brilliant hues with delicate tints, and, as of supreme importance, it perfumes the air with grateful fragrance, which rises up through the fine pores of its scented petals. Let me guard against any possible assumption that, in pleading for the recognition of the Carnation as a border plant, I am in any way opposing the practice or manifesting hostility to the methods of the florist, who grows his plants in pots in order to secure fine exhibition flowers. Nothing of the kind. The florist—meaning thereby the cultivator for exhibition—is as much an advocate of border culture for the Carnation as I am, or anyone else. I state this much because it has been made to appear that the florist cultivates a number of varieties in pots that need to be so treated, making them—so his critics say—greenhouse plants, because they are weakly and delicate, and unless so treated would surely die. In such strains of playful banter some writers are found gently tickling the susceptibilities of our floricultural brethren who make up our Carnation shows. Nothing can be further from the truth, except it is this type of writer. Many of the best varieties of bizarre and

flaked Carnations and edged Picotees are so robust and so full of constitutional vigour that they make excellent border plants, as can be seen by the beds in these Chiswick gardens planted with Carnations received from all parts of the country. I do not think I ever knew a grower of Carnations in pots who did not also have his beds and borders of Carnations in the open. If he be a raiser of improved varieties from seed, he plants them out in the open and proves them there, and if anything of promise reward his efforts he will lift the plant and place it in a pot for security, as also for the convenience of layering the grass, and so obtaining increase. Do we not all adopt the practice of specially caring for those possessions to which we attach the greatest value?—though I have known a florist to think much more highly of a seedling flower than of his own reputation. I confess that when I visit Mr. Dodwell's Carnation garden at Oxford during the blooming time I always take more interest in the beds of seedlings in the open than in the named varieties he cultivates in pots. They overflow into beds and borders at all points; it is a kind of Carnation inundation that for a time almost hides from view every other floral aspect. And there is scarcely an exhibitor of Carnations of whose garden this could not be said. The real fact is, it is the florist who raises superior varieties of the Carnation that does so much to enrich our borders with new and valuable flowers. He is limited by the rules governing exhibitions in his selection of types to grow. Outside of these are hundreds full of grace and tenderness—winsome and delightful floral morsels—that become the occupants of the borders, gilding and enlivening them with touches of beauty, of which the Carnation is so prodigal. There is nothing too good to go into the open border; the most valuable Carnation ever raised would not be out of place there. There is excellent common sense in the remark made by old Luke Ashmole, of Tulip renown, some years ago: "Thou knowest that a good thing takes up no more room in the garden than a bad one, and what's the use of growing a bad one?" Let some organs of the gardening press rage ever so furiously, and ambitious and not always well-informed writers imagine a vain thing, to-day, in our Carnation Parliament, we gratefully acknowledge the valuable help of the florist in enriching our borders with lovely Carnations.

I would have every grower of border Carnations be also a raiser of seedlings. It is a hackneyed saying, but I do not think

any cultivator of flowers has rightly comprehended the poetry of the subject until he has raised and bloomed seedlings. There is romance in it as well as poetry ; the evolution of seedling flowers is so full of surprises as to come near to the miraculous. Let anyone who to-day has found in the Carnation a goddess worthy of his worship and a life's devotion make a note of some of the varieties exhibited which strike him as being worthy of possession, or that are in the Carnation beds yonder. Let him obtain young plants of these in the autumn, and plant them out in a well-prepared bed, tend them as objects of almost priceless value, bloom them well, and then, if Nature is in a consenting mood, save some seed, and commence the fascinating and all-engrossing pastime of raising seedlings. Or, to save time, he may prefer to obtain seed from a reliable source. Let him sow it—not in the autumn, for that is risky without due convenience for wintering the plants, but in the opening spring-time—early in March to April, when the storm of heat rolls hitherward :—

Enveloping heat, enchanted robe,
Wraps the daisy and the globe,
Transforming what it doth unfold,
Life out of death, new out of old.

Sow the seed carefully in pots, pans, or a shallow box of a suitable and somewhat gritty compost, place them in a cold frame, keep them cool and moist, and in a short time the tiny plants will appear. As soon as they are large enough to bear it, let him prick them off into shallow boxes or deep pans, protecting them from withering winds and drying sunshine, and grow them on until they become large enough for transplanting to beds in the open ground. The older florists in the North used to make a point of sowing seed at midsummer, doing it in the open air on a northern aspect ; and they always advocated deep sowing. Nowadays a quicker return is sought for ; hence the plan of sowing I have suggested. The position of the bed is a matter of moment—the Carnation likes an open and breezy aspect, revelling in pure air and bright sunshine. Important also is the matter of soil. I think the soil of the Chiswick Gardens too light generally for the Carnation. It does best in a fairly firm one, and, if a suitable compost has to be prepared, let it be of good fibry yellow loam, with the addition of plenty of thoroughly rotten manure from any old cucumber bed, as

far as possible free from grubs and any noxious insects; add some leaf-mould and the ashes from burnt vegetable refuse, or, failing that, some grit from a gravelled, but not a granite, road. The bed should be deeply dug, and the manure and other materials forked into it to the depth of a foot or so. If the soil of the garden be a light and friable one, it should be strengthened and made firmer by the addition of some stiff yellow loam, and then a good Carnation bed is secured; and at the time of planting let the plants be removed with as much soil as possible adhering to the roots, so that the check in development shall be a slight one—placing a little fine compost about the roots to encourage a quick root action, and pressing the soil firmly about the plants. Carnations, whether in pots or in borders, may be said to like a firm bottom; if the soil be light and loose, the plants suffer severely at a time of drought. Whether a bed be made specially for the plants (which is not always convenient), or the plants be placed in the mixed border, let there be good cultivation. He who would have good flowers must cultivate well—that is a golden rule in plant culture for all time. Other points in the cultural process are to give a support to any plants at the time of planting that may need it, and maintain this until blooming time; let the surface be stirred occasionally, and be kept clear of weeds, and let the soil be kept firm about the roots of the plants, and some top-dressing of a rich character be occasionally given.

When planting out in beds the plants should be eighteen inches apart, and even further in the case of strong-growing varieties, so that they may be conveniently layered. A keen look-out must be kept for vermin—for wireworm and grubs in the soil, for green-fly and cuckoo-spit on the foliage, and that marauder by night, the snail—and no quarter be given. By means of a large camel's-hair brush, green-fly can be swept away into infinite space; frequent brushings are advantageous. The green-fly is a small and insignificant insect, but it can tax the resources and exhaust the patience of the biggest man.

Do not trouble about plants that have bloomed two years in succession; their tenure of existence is uncertain and their flowers small. It is better to renew annually by seedlings or by layers. Let the work of layering be performed by the end of July or early in August, so that the layers may root well by the

autumn. No winter will destroy a healthy, well-rooted layer ; but the winter will often destroy the pith of old plants, and death ensues.

Success in Carnation culture lies through a round of daily attentions constantly given. It is the small services rendered to the plants which help to make up the sum of success. Remember the story of the sculptor Michael Angelo. A friend called on him as he had just finished a bust. He called a month afterwards, and there was still the bust—apparently untouched during the intervening period. Accusing the sculptor of idleness, Angelo replied by instancing the execution of several small details which had improved his work. “But these are trifles” said his visitor. “True,” said the sculptor, “but trifles make perfection, and perfection is no trifle.” So it is with the successful culture of Carnations and other plants.

The critics of the florist in the gardening papers are sometimes imaginary painters ; they picture an ideal plant of a Carnation so dwarf and robust that it can support its head of bloom without stakes. I have never yet seen a satisfactory representative of this ideal plant able to set wind and rain at defiance. You cannot coerce Nature into producing plants of equal height. She manifests her independence by bringing forth both tall and short ones. Some like tall and some short plants of Carnations. I like them all if they carry beautiful flowers. Some day one of these critics may depose Nature and assume the reins of government in the vegetable kingdom, and then we shall see floral wonders made to order. Till then we must be content with what comes in the ordinary way of things, and be very thankful that the Carnation is such a lovely, useful, and satisfying flower, and that, let it be presented to us in any form that is fair and beautiful, we shall gratefully welcome it, and heartily recognise its great capacities for calling forth the admiration, ministering to the delights, and so gladdening the hearts of the children of men.

DISCUSSION.

In reply to a question from Mr. PEARSON as to the reason why the sweepings from gravel instead of granite roads should be used, Mr. DEAN said that because the sweepings from gravel

roads did not make the soil sticky, as the sweepings from granite did.

Mr. ROWAN said this applied also in the case of soil for Verbenas.

Mr. SMITH (the Chairman) asked if there was any "royal road" by which maggot might be destroyed; and the general opinion was that this could only be achieved by means of the finger and thumb.

A gentleman asked if anyone could give him any information respecting a certain disease which attacked the stems of Carnations just above the ground. This disease appeared suddenly and quickly destroyed plants which twenty-four hours previously were in the best of health.

Dr. MASTERS said he believed the gentleman referred to what was known as the "eelworm," and there was no remedy, he feared, for this ruthless destroyer other than the total cremation of the plants attacked.

At the close of the Conference Dr. MASTERS said the pleasant duty had been imposed on him of expressing on behalf of the audience their thanks to the readers of papers that afternoon. Before sitting down he said he would like to ask a question, namely, whether Fairchild's "mule" was still in existence. It was a hybrid between *Dianthus Caryophyllus* and *D. barbatus*, and was not only the first hybrid Carnation ever raised, as it was produced at the end of the 17th century in the village of Hoxton, but actually the first artificial hybrid of any kind on record. Some of the clerical auditors who were familiar with flower-services would perhaps know something about this plant, as Fairchild, who died in 1667, left a sum of money to the preacher of his parish that he might set forth the omnipotence of the Creator by means of an annual flower-service in the church.

FERN CONFERENCE.

WEDNESDAY, JULY 23, 1890.

A CONFERENCE on Ferns was held at the Chiswick Gardens on Wednesday, July 23.

In the absence, through illness, of J. G. Baker, Esq., F.R.S., President of the Conference, the chair was taken at 2 P.M. by Dr. Maxwell T. Masters, F.R.S., who, in opening the proceedings, expressed the regret that all lovers of Ferns felt at the absence of Mr. Baker, whose presence would have been of so much importance on this occasion, when questions of nomenclature and of classification would have to be considered. The Chairman then read the following note sent by Mr. Baker :—

“ I am very sorry not to be able to be present personally at the discussion this afternoon. What I particularly wished to bring before the Congress is the very unsatisfactory condition at the present time of the nomenclature of the varieties of British Ferns. In Lindley and Moore’s ‘ Nature-printed Ferns ’ and in Lowe’s ‘ British Ferns ’ (pub. 1867) a large number of varieties is described and figured. About the nomenclature and identification of these there is no difficulty. A very large addition is made to these in Fraser’s Catalogue of 1868, and since 1868 Mr. Lowe and others have added a large number of new names. For the forms of the sixty British Ferns I am certainly not exaggerating in saying that three thousand Latin names have been invented. The result is a complete chaos, and I wish to appeal to Mr. Lowe, who has worked so long and so actively in the field, to make an attempt to put a stop to this state of things. The best way to do this, so far as I can judge, would be to separate the true varieties from the monstrosities and to classify the subordinate forms under the leading types. A great number of the names have no botanical standing, because they have not been published anywhere with a definition. I very much wish Mr. Lowe would write a paper on this basis for the *Journal* of the Horticultural Society, codifying the nomenclature, and referring to the figures in

his book as a standard of comparison for the added names published by Fraser, and any that have not been put into print which he thinks worth mention. Unless this is done by someone who, like himself and Mr. Wollaston, understands the matter thoroughly, it will have to be done in a few years' time by someone very much less qualified for the work.

“ J. G. BAKER.

“ Kew, July 23, 1890.”

WHICH ARE THE OLDEST FERNS ?

By Professor BOWER, D.Sc., F.L.S.

To many who take an interest in their cultivation, and are the most enthusiastic admirers of their beauty, Ferns are simply Ferns, and their relation to other families of plants is a matter of minor importance, or perhaps never considered. But to those who pursue comparative morphology—and I believe that the majority of Fern cultivators really fall into this category—it is ever an object to trace evolutionary series within given groups of organisms, in the expectation that this may lead to a better recognition of the relation of the group in question to others. And so with Ferns it should be our first object to lay them out in such a series as we may believe to correspond more or less nearly to the course of their evolution.

It has been the result of my own comparative observations, extending over a considerable period, together with the facts recorded by others, to demonstrate that such a series exists, and the conclusions are enunciated at length in the “Annals of Botany,” vol. iii. Here it will suffice to state that by a comparison of the various parts of the Fern plant in the embryonic condition—viz. of stems, leaves, wings of the leaf, roots, and sporangia—it is possible to range the chief families of Ferns as a series. At one end of this series would be placed those whose several parts are of more complex construction, and from the first relatively bulky, while at the other end would be those which are of more simple construction and more delicate in texture.

As a key to the whole may be taken the case of the sporangium, and it is to be noted that the facts of development were first worked out in the sporangium, and upon them were based the distinction of Eusporangiate and Leptosporangiate Ferns. Taking first those of simpler construction, the sporangium is there seen to originate from a single superficial cell, which projects as a single cell beyond the general surface of the leaf which bears it, before the segmentation begins. The divisions of this cell are for the most part definite and regular, and the result is the development of a stalked sporangium, of relatively small size, with a wall consisting, when mature, of a single layer of cells, which encloses the mass of spores; to this more simple type belong the sporangia of the *Hymenophyllaceæ*, *Polypodiaceæ*, and *Cyatheaceæ*, which are accordingly styled collectively, together with certain other minor families, the Leptosporangiate Ferns. At the other end of the series are to be placed those Ferns which have a more bulky type of sporangia; here they originate as an outgrowth of a mass of cells, not referable in origin directly to a single parent cell. The segmentation in these is not so definite or strictly regular, and the individual sporangium when mature is not stalked, but is inserted by a broad base either directly upon the frond or upon a joint outgrowth at the base of the whole sorus. The sporangia themselves are often laterally confluent, so as to form large masses, or they may be deeply sunk in the tissue of the frond. To this type belong the *Marattiaceæ* and *Ophioglossaceæ*, and they are styled the Eusporangiate Ferns.

Between these extremes are found, as intermediate types, the *Schizæaceæ*, of which the affinities appear to be rather to the *Leptosporangiatæ*, and the *Osmundaceæ*, which constitute a well-marked connecting link between these and the *Eusporangiatæ*.

It has been found, as the result of a comparison of the other parts of Ferns of the above families—viz. stem, root, leaf, and wings of leaf—that, as regards regularity of segmentation and relative complexity of structure, there is a remarkable parallelism with the characters of the sporangium, so that the sporangium may be taken as a general index of the nature of the other meristems; where the segmentation of the sporangium is precise and regular, as is the *Leptosporangiatæ*, the same is the case with several apical meristems, while in the *Eusporan-*

giatæ a less regularity of segmentation accompanies the greater bulkiness of all the parts. Thus, as regards the embryonic characters of all the parts of the sporophyte, the Ferns may be ranged in a series starting with the *Leptosporangiates*, and leading through the *Schizæacæ* and *Osmundacæ* to the *Eusporangiata*.

But while we thus trace the characters of the embryonic tissues (in itself a somewhat technical study), it must not be forgotten that these are the parent tissues of the several parts; speaking broadly, it may be stated that the several parts of the mature *Eusporangiate* Ferns—stem, leaf, wing, root, or sporangium—are of a more bulky mould than the corresponding parts of the *Leptosporangiates*. In the case of other plants we recognise a more bulky habit as commonly characteristic of plants of dry situations, while a delicate habit is more usual for those exposed to moist air or shaded, and there is no apparent reason why we should not recognise in the series above indicated a similar correlation, which would find its justification in the well-known facts that such plants as *Botrychium* and *Ophioglossum* may be found growing on exposed hillsides, and the former even on dry, sandy links, while the Filmy Ferns are at home in shady, damp situations, and require to be cultivated in closed glass cases.

A comparative examination of the sexual generation shows that in it also a parallelism is to be traced as regards relative bulk. The prothallus of the massive *Marattiacæ* and *Ophioglossacæ* is itself also massive, and the antheridia and archegonia are sunk in the tissue of the prothallus, thus corresponding to the massive or deeply sunk sporangia of the sporophyte; in the *Hymenophyllacæ* the prothallus is even protonema-like and filamentous, and the sexual organs are prominent and exposed, thus corresponding to the sporangia of these same plants. There is, I think, every reason for recognising here again that the *Eusporangiate* Ferns are better fitted for growth under circumstances of exposure to drought than the *Leptosporangiate*. To sum up, whether we consider the embryonic condition of the stem, leaf, wing, root, or sporangium, or even the prothallus and the mode of insertion of its sexual organs, the *Homosporous* Ferns constitute a series

between extremes of greater and less bulk, and the series may be laid down thus :—

(Relatively bulky.)

Ophioglossaceæ.

Marattiaceæ.

Osmundaceæ.

Schizæaceæ.

(Gleicheniaceæ?)

Polypodiaceæ and Cyatheaceæ.

Hymenophyllaceæ.

(Relatively delicate.)

This I believe to be a true series, from the evolutionary point of view ; it may be objected that bulk is not always a satisfactory character, and I admit that in detail it is not within narrow circles of affinity. Everyone knows of genera which include both relatively delicate and fleshy forms—*e.g.* Euphorbia, Senecio ; or it may be pointed out that a single species may vary in this character according to its position, and I well remember a peculiarly fleshy form of *Lychnis dioica* growing on the Bass Rock, in appearance quite distinct from the inland plant ; and this is not uncommon in other plants. But the point is, in the case of the series of Ferns, that all the parts show the parallelism, and that it may be traced in the earliest stages of development. Moreover the series, as above laid out, conforms in the main to the views of botanists, arrived at on purely systematic, as apart from developmental, grounds ; a point which is the strongest possible support to the recognition of the series as a natural one.

I shall assume, therefore, that it will be granted that the series is a natural one, and we may now proceed to discuss the main question with regard to it, which I propose to bring before you to-day, viz. which is the upper and which is the lower end of the series ; in other words, are these more simple *Hymenophyllaceæ* the original type of Ferns, or are they a degenerate type ?

In the memoir, published in 1889, in which this series was laid out and discussed (p. 374) I concluded that the series from the *Hymenophyllaceæ* onwards is an ascending series, though it was remarked that the converse is capable of defence ; since then a paper taking the opposite view has been published by Douglas H. Campbell (*Bot. Gaz.* January 1890). But since this does not exhaust the discussion I shall now reconsider the *pros* and *cons* of these two views ; and first we shall see what may be

said for the Filmy Ferns, as representing the more primitive forms.

1. On the general ground that because development has proceeded from the simpler to the more complex, it may be assumed that the comparatively simple *Hymenophyllaceæ* were the original type, and certain points of similarity to the Mosses strengthen the assumption; but nowadays everyone knows that degeneration in one form or another, resulting in simplification, is not uncommon, and most parasites, or any aquatic Phanerogam, might serve as an example to show that this assumption is untrustworthy, unless it be supported by strong evidence.

2. Let us then examine the evidence by comparison of the *Hymenophyllaceæ* with the Mosses. The chief points of similarity are:—

- (i.) The filamentous, protonema-like prothallus.
- (ii.) The projecting sexual organs.
- (iii.) The presence of single, well-defined apical cells.
- (iv.) The filmy character of the leaf.

The last of these may be at once dismissed; it is obvious that the filmy leaf of the *Hymenophyllaceæ* is a part of the sporophyte, while the so-called leaf of the Moss is part of the gametophyte; the two are not homologous parts, and accordingly the comparison cannot be looked upon as convincing. Moreover the "filmy" character is not restricted to any one division of the Ferns; it appears in the *Aspleniums* and *Todeas* as well as in the *Hymenophyllaceæ*, and therefore we have every reason to believe that it is a character of adaptation to a moist habitat, which may be assumed at distinct points in the system, in which case the similarity of the Moss-leaf and that of the Filmy Ferns might also be viewed as a similar adaptation rather than as a token of affinity.

The presence of a single apical cell at the apex of the young Moss sporogonium, and also at the apex of the stem, leaf, and root of the Leptosporangiate Ferns, while such are absent (or less definite) in the Eusporangiate Ferns, is certainly a fact worthy of note; and the common presence of single initial cells in the lower forms, and their absence from most Phanerogams, may be regarded as pointing towards the conclusion that the former are the lower in the scale. Examples are, however, known

of the existence of a single initial cell in Phanerogams,* while such a regular and definite type of meristematic construction is absent in certain Thallophytes and Bryophytes, so that this cannot be accepted as a decisive point. The presence of a single initial seems frequently to follow a less robust habit: plants of aquatic position are commonly of delicate texture; most of the lower forms are more or less distinctively aquatic: accordingly, though many of the lower forms have a single initial cell, the presence of a single initial need not necessarily be viewed as an indication of low affinity, but rather it may, at least in some cases, be the outcome of adaptation as regards bulk to a relatively moist habitat.

But it is in the characters of the gametophyte that the affinities of the *Hymenophyllaceæ* to the Mosses appear to be most obvious. The filamentous prothallus of the former is so very like the protonema of the Moss, and the free protrusion of the sexual organs beyond the general surface of the gametophyte so striking in them both, and in some cases the reproduction of the gametophyte by gemmæ so similar, that the comparison hardly needs to be pointed out. But against these similarities, which it is quite possible to imagine may have arisen from adaptation of distinct stocks to similar external conditions, is to be set the objection which will weigh most heavily with many, and is specially alluded to by D. Campbell, viz. that the leptosporangiate sporangium is quite unlike anything found among the Bryophytes or Algæ; there is among known forms none which gives a definite clue to such a transition as that which must have occurred if the *Hymenophyllaceæ* were the original Ferns, and were derived from the Bryophytes. It is true that Prantl has attempted to compare the sorus of the *Hymenophyllaceæ* with the capsule of *Anthoceros*,† but a suggestion which depends upon the conversion of the internal sporogonous layer into a number of superficial sporangia, without any evidence that such a conversion ever took place, here or in any other series of plants, will hardly commend itself to the reason as in any way probable. Moreover it is not apparent on other grounds that there is any near affinity between *Anthoceros* and the *Hymenophyllaceæ*.

* The most prominent example is the root of *Heleocharis palustris*, and it is to be noticed that this is a plant of aquatic habit.

† *Hymenophyllaceæ*, p. 62.

Having now considered the several points of similarity between the *Hymenophyllaceæ* and the Mosses, and having recognised where the chief difficulty lies in imagining a transition from the Bryophyta of the present day to the Filmy Ferns, we may turn to the other end of the Filicineous series, and discuss the probability of the Eusporangiate Ferns being the more primitive type. It may be stated at once that the affinity of the *Eusporangiate* is rather to certain Liverworts than to the true Mosses, and the whole question practically resolves itself into this—whether the affinity of the *Hymenophyllaceæ* to the *Musci*, or of the Eusporangiates to the Liverworts, be the nearer and the truer one.

Comparing the gametophyte of *Anthoceros* with that of *Marattia* (or even *Ophioglossum*, though this is too imperfectly known), the similarity of general conformation is obvious enough; but especially the deeply immersed position of the archegonia in both cases is worthy of remark. The similarity is here quite as great as that above traced between the gametophytes of the *Hymenophyllaceæ* and Mosses. But I do not propose to draw detailed comparisons between any one Eusporangiate Fern and any one of the Liverworts, but rather approach the question from a more general point of view. The following general reflections appear to me to deserve consideration:—

1. Of the three phyla of Vascular Cryptogams the two others—the *Lycopods* and *Equiseta*—are eusporangiate. If, as is most probable, these, though now distinct, had a common origin with the Ferns, it would be reasonable to assume that the original Ferns would also be eusporangiate, and the leptosporangiate type be of more recent origin. Colour is lent to this assumption by the absence of any intermediate steps leading to the leptosporangiate type, excepting through the *Eusporangiate* themselves.

2. If the *Eusporangiate* were derived from the Liverworts, the bulky sporangium is already foreshadowed by the capsule itself, and it is hardly going too far to say that the capsule of a *Jungermannia* or a *Marchantia* is one eusporangiate sporangium. Thus, by whatever line of development the more complex sporophyte, with its leaves, stem, and root, was derived, the bulky eusporangiate type is probably the original one.

3. Passing on to the apical meristems, the characters of these

have been used by me as evidence in laying out the *Filicineæ* in series as above stated; such evidence is of greater weight within narrow circles of affinity than in comparison of more remotely related organisms. It is, however, worthy of note that in the Liverworts a single initial is not present as in the Moss sporogonium. The epibasal half of the zygote divides into four quarters by principal walls, which might be compared with those found in apices of the Marattiaceous type; but it would be a mistake to put too fine a point upon such a comparison as this.

4. The evidence from the geological side is interesting and important, even while allowing a liberal discount for imperfect representation of the Flora of any given period. The general conclusion of Palæophytologists is that though in the Devonian and Carboniferous periods Ferns of the Marattiaceous type were among the most prevalent of plant-forms, Leptosporangiate Ferns were apparently uncommon or even absent, and there are those who hold that no undoubted remains of them have been found in those strata; in the Rhætic series of transition between the Trias and the Lias, Ferns allied to our present *Gleicheniaceæ* appear to have been common, and other leptosporangiate forms appear in more recent rocks. Whether or not the *Leptosporangiatæ* were actually absent during the earlier periods, there can be no doubt that the *Eusporangiatæ*, which are now so restricted both in number of genera and species, and also in geographical area, were in the ascendant at the Carboniferous period. It may be urged that the more delicate structure of the sporangium of other forms prevented their preservation; but, on the other hand, the annulus is a firm band of tissue, and quite as likely to be preserved as many of the tissues which retain their characters in geological specimens. It will also be pointed out that very many of the fossil Ferns show no fructification at all. This is true, but as far as the positive and well-ascertained facts go, they appear to point to the conclusion that the *Eusporangiatæ* were the prior forms, or at least that their period of prevalence was prior to that of the *Leptosporangiatæ*.

It may, however, be objected that the leaves of the *Marattiaceæ* are commonly of a highly branched type, while those of certain *Hymenophyllaceæ* are simple, and the simpler form is the more likely to be the original. It is true that the *Marattiaceæ* cultivated in gardens have branched leaves, but this is not the

case with them all—*e.g.* *Danaea simplicifolia*, Rudge, in which the leaves are simple, and bear on their lower surfaces the synangia, or sori, composed of coalescent sporangia, which dehisce by terminal pores; and I do not feel that the difficulties are greater in regarding this as a relatively primitive form than if we place one of the simpler *Hymenophyllaceæ* in that position. The view that the Eusporangiate Ferns, including the *Ophioglossaceæ*, may represent a relatively ancient form as compared with the *Leptosporangiateæ* is thus capable of defence—I am even disposed to think the weight of evidence is in its favour. At the same time, however, it is to be constantly remembered how great the gulf is between the *Filicineæ* and the *Bryophyta*, so great indeed as to make it difficult to conceive by what steps the transition came about, and to leave it a matter for speculation, rather than of demonstration, which are the nearest points of contact of the two series. But, as above stated, the choice now seems to be between an affinity of the *Musci* and *Hymenophyllaceæ*, or of the Eusporangiates and the Liverworts, and, as at present advised, I am disposed to think the latter the more probable.

The effect of this, if established, will be in some measure to modify the general view of the relations of the main series of plant-forms. The *Bryophyta* and *Filicineæ* might be viewed as two series which show a certain parallelism of adaptation to a moist habit. In each case the series would start with a relatively bulky character of all the parts, and especially with the sexual organs more or less completely immersed; the progression would be in either case towards forms with filmy, foliar characters, a filamentous stage of the gametophyte, and with the sexual organs not deeply immersed. Both these series would be so-called "blind" branches of development, leading on to no higher forms. As regards the geological evidence, the more delicate representatives of both phyla probably represent forms of relatively recent origin, and the absence of Mosses from the earlier strata is to be noted in this connection.

Secondly, it seems very probable that the *Marattiaceæ* are related to the Cycads; accordingly, if the former be viewed as more primitive Ferns, the developmental series leading to the latter is proportionally telescoped, while *Isoetes*, which has of late been a subject of frequent discussion, would probably find a place as

representing an independent line intermediate between the Eusporangiate Ferns and the Lycopods.

But while we may thus speculate as to the evolutionary relations of these several forms, it will be well to hold firmly to the main point which has served as the basis for this discussion, viz. that on the ground of detailed comparison the homosporous *Filicineæ* form a natural series extending between two extremes. At the one end of the series may be placed those in which all the parts are relatively bulky in origin, and show irregularity of meristematic segmentation—these are the *Eusporangiatæ*; at the other end of the series are those in which all the parts are relatively delicate in construction, and the meristematic segmentation is definite and regular—these are the Filmy Ferns. In this series we probably see the results on the one hand of adaptation to relatively dry conditions, on the other to a comparatively humid habitat; and, whichever end of the series is ultimately proved to have been the primitive one, the fact that the series exists is, in my opinion, beyond the possibility of doubt.

HYBRID FERNS AND CROSSED VARIETIES.

By Mr. E. J. LOWE, F.R.S.

A PAPER embracing all that is of interest in so important a subject as hybrid species and crossed varieties would occupy more time than could be devoted to it this afternoon. An outline is all that can be attempted.

It is comparatively a new branch of inquiry, and fresh facts are constantly cropping up.

Although the crossing of Ferns has only been recently acknowledged, nevertheless my own investigations, experiments, and, may I add, successes commenced many years ago, dating even to the middle of the century. It has therefore been thought that a brief history of my own work may not be unacceptable.

In the first place, let me explain that a hybrid Fern is the offspring of two so-called species—as example, between *Asplenium marinum* and *Asplenium lanceolatum*, whilst the offspring of two varieties of the same species is called a cross.

Forty-six years ago a German botanist discovered the reproductive organs of Ferns ; before this we only knew that sori containing numbers of spores were formed on the underside of the fronds, and that these varied in shape and position in different genera. Spores when they fell to the ground under favourable circumstances were known to germinate, at first appearing as mere points, and in course of time expanding and somewhat imitating the appearance of Liverwort. Eventually a tiny frondlet would show itself, to be followed by others, larger and larger, and more and more developed, until a mature plant resulted.

It was on the underside, during its prothalloid or Liverwort life, that the reproductive organs were discovered. Thus there is a dual existence : the spore producing the prothallus, and the impregnated prothallus the frond-life, which in its turn produces the spore to repeat the process. This discovery was made in the year 1844. The late Professor Henfrey gave me the details in 1851, and I remember at once pointing out to the late Professor Edward Forbes that it could not be difficult to cross Ferns, and by his persuasion commenced experiments. At that time there were but few well-marked varieties, but in the next ten years many more were discovered by Padley, Barnes, Clapham, Stansfield, Sim, and others.

My first spores were sown in 1855, but the crop of seedlings were nearly all normal, whilst at the present time it is difficult for me to raise a normal form ; one or two marked varieties used to be the reward, now they can be counted by hundreds. Most of the Ferns that I have brought to this show are my own crosses. We have now got so far away from the original species that the original characters seem to be lost.

When living in Nottinghamshire there were no wild Ferns near my residence, but favourable situations were in course of time crowded with varieties scattered by the winds from the fernery. I could by the year 1875 find more distinct forms within a mile radius than could be collected by months' diligent search in a wild Fern district. This has been repeated at Shirenewton, for, although my Ferns have not been there ten years, the spores have sown themselves in all directions.

Where Ferns grow under adverse circumstances there appears to be more variation in form. To test whether bad treatment would produce any change in shape, the drainage was removed

from a large plant of *Asplenium nidum*; this was done in the autumn, and all the spring fronds came up crested. Spores from these produced a crested variety. A change of circumstances with a large number of varieties of *Scolopendrium vulgare*—*i.e.* planted where the surroundings were not favourable—caused all of them to return to the normal form of the species. Under pot culture I have never found varieties to degenerate; better soil, a more favourable situation, and greater attention is a sufficient reason.

At the Dundee meeting of the British Association in 1867 I pointed out that a certain law of form in the varieties of Ferns seemed to be common to all species—crested, branched, revolved, truncated, tortuose, brachiated, plumose, cruciate, linear, depauperate in both fronds, pinnae and pinnules—and the manner of these changes are common to all the species, and even the multiple of these, the combination of several characters, such as the linear-crested or cruciate-crested. In course of time we may produce plants having many of these forms combined on the same frond.

Again, spores gathered from an abnormal portion of a frond can reproduce this abnormality, whilst spores from a normal portion of the same frond can produce normal plants. Also if plants are raised from varieties for several generations, it is almost impossible to obtain the original normal forms.

The spores from crossed varieties are quite as prolific as that of the normal form, whilst hybrids—*i.e.* crossed species—are all but sterile. There appears to be no absolute sterility. Take the hybrid that I raised between the *Aspidiums aculeatum* and *angulare*. A hundred pans of spores that I sowed did not produce a single plant. Mr. Carbonell, however, raised nine, and Mr. Barnes thirty plants, all of which differ from the parents and hybrids, the grandchildren being more or less congested in growth. With regard to *Nephrodium remotum*, a hybrid between *spinulosum* and *filix-mas*, repeated sowing of spores for more than ten years did not produce a single plant, though by accident Dr. Stansfield has succeeded.

At the British Association meeting in 1870 I gave the following additional results:—

Spores from a normal frond produced only normal Ferns.

Equal proportions of spores from a normal and from an abnormal frond produced 90 per cent. of abnormal forms.

Spores sown in separate pans from abnormal fronds produced plants like the variety from which they were gathered.

Spores from a dozen varieties mixed together produced many new varieties, and the more remarkable the varieties selected, the more extraordinary were the results.

Further experiments on hybrid Ferns and crossed varieties were reported to the British Association in 1865, 1867, 1870, and 1888, but the late Professor Hutton Balfour was the only botanist who would allow that a cross had been obtained up to the year 1885; indeed it was difficult even to convince such experimental Fern authorities as the late Thomas Moore and Abraham Clapham, although the latter in 1879 acknowledged he was satisfied, and, what was more to the point, commenced experiments and raised some beautiful forms of *Polypodium vulgare*. A large number of fine varieties have been raised by crossing, and in this respect we are especially indebted to the late Colonel Jones, Mr. Barnes, and Mr. Clapham, as well as Messrs. Stansfield and Mr. E. F. Fox, for many of these plants, and also for numerous wild finds; for the latter we must also acknowledge the successful labours of Padley, Elworthy, Hodgson, Moly, Lyall, James, Wollaston, Phillips, Mapplebeck, Kitson, Thompson, Foster, O'Kelly, Fraser, Praeger, Cooper, Druery, Patey, Fitt, Cowburn, and others. Far more varieties are raised from spores than are found wild, but we get new blood, new forms, and consequently increased vigour from the latter, that adds to the importance of wild finds.

Some Ferns have young plants growing on their fronds, and these are termed "bulbils," yet these young plants are not invariably like the parent. In 1865 bulbils from *Scolopendrium Wardii* produced strong-growing conglomerate forms, and bulbils on the crested *Osmunda regalis* produced a dwarf *grandiceps*, with a more spreading root; this plant is twenty-five years old, and is here to-day. Bulbils from *Scolopendrium Kelwayi* have produced a more diminutive form; and others from Colonel Jones' polydactylous *divisolobum* of *Aspidium angulare*, plants that are not polydactylous.* Ferns that are not usually bulbiferous

* The beautiful plumose varieties of *Aspidium angulare Baldwini* and *imbricatum*, which received certificates at the Conference, were from bulbils produced on the *densum* of *divisolobum-plumosum*.

occasionally put on this character. Miss Bellairs sent me the Axminster plumose Lady Fern, having the fronds crowded with young plants.

There is yet another means of propagation which has been discovered by Mr. Druery in the sterile Lady Fern known as *clarissima*. This is in reality the formation of prothalli on the frond without the medium of the spore; when these touch the ground they strike roots and produce fronds. More than twenty years ago Mr. Clapham showed me an *Adiantum Capillus-veneris*, having fronds touching the ground, producing a crop of young plants, and this might have been a case of apospory. Plants, however, raised by this means are also liable to sport. Colonel Jones had several more or less revolved, one furcate, and another not unlike Elworthy's *subplumosum*.

As soon as the discovery of the reproductive organs was known, it occurred to me that the character of the frond must depend upon whether impregnation took place from the same prothallus or from one of a different Fern. This determined me, in making my first experiments, to mix the spores of two varieties of the Hart's-tongue, and as another experiment two varieties of the Lady Fern. The seedlings from these were convincing that a cross had been obtained between the two varieties.

The next experiment was with spores from the varieties of the Lady Fern known as *Victoriæ* and *proteoides*. These seedlings showed a series of variations, having *Victoriæ* at the one extreme and *proteoides* at the other.

The third experiment was the mixing together the spores of half-a-dozen varieties of the Lady Fern, and, as a further trial, half-a-dozen varieties of the Hart's-tongue. This brought out a new fact—there were seedlings that showed the characters of three, and even four, varieties on a single frond, so that male organs from several varieties had assisted in this impregnation. The microscopic character of these organs was a difficulty to be overcome in crossing Ferns, and the only way to overcome this seemed to be sowing the Fern spores thickly together, trusting to their close proximity to enable two or more varieties to be self-crossed. The antheridia (or male organs) having been noticed to move about with activity in the moisture on the surface of the prothallus, it was thought possible for them to come in contact with the archegonia on another prothallus, and thus fertilisation

would take place on a different plant ; and this has been accomplished.

The above idea was considerably strengthened more recently from the remarks of my friend Dr. Hudson, a great authority on microscopic animal life. He showed that it required a crowd of male organs to effect impregnation amongst microscopic animals ; and to test this with Ferns further experiments were made—*i.e.* sowing together in equal quantities spores from a crested and a normal form of *Nephrodium paleaceum*--in order to ascertain the proportion of crested to non-crested seedlings. These plants are young, and therefore have not as yet their distinctive characters ; nevertheless there is not a single plant that is not crested more or less. However, I had in reality proved this previously when spores from four varieties sown together produced seedlings having all their characters on one frond.

A further experiment with the Hart's-tongue is also of peculiar interest. An undulate form, a spiral form, a rugose form, and a tasselled form were sown together, and amongst the seedlings there are plants that exhibit all these characteristics.

Ferns that I am now sowing spores from have a long pedigree. Some date back more than thirty years, at least a dozen generations, and the seedlings from these plants are all abnormal. Over and over again I have had batches of seedlings without producing a single common normal form. It is quite true that these may degenerate under adverse circumstances to the original form, and keep normal under those conditions. Nevertheless a more generous treatment and a more suitable situation will, in the course of time, restore them to their original varietal characters. As early as 1844 I divided *Polypodium cambricum* and *Scolopendrium crispum*, growing the one half in large flower-pots and planting out the other halves in exposed situations in a soil mainly composed of New Red Sandstone. In the course of a few years both these had returned to the normal state, yet divisions taken from them in time again became true *cambricum* and *crispum*. This was also well seen in the *Scolopendriums* that I moved from Nottinghamshire to Shirenewton Hall in 1881. They were planted in an unsuitable situation, and although there were nearly five hundred distinct varieties, in three or four years they were all common Hart's-tongues. In 1886 and 1887 they were

again transplanted, and have gradually returned to their varietal form, some of them being exhibited here.

In 1876 an attempt was made to cross two species; and as there were no known cruciate forms of *Aspidium aculeatum*, it was determined to try to produce one, for if successful this would be a satisfactory proof. The varieties selected were *Aspidium angulare* var. *Wakleyanum* and *Aspidium aculeatum* var. *densum*, the former being cruciate. Out of a batch of several thousand seedlings there were five plants unmistakably cruciate *aculeatums*, and also a close copy of the cruciate *angulare*. For six years these five plants were normal *aculeatums*, but on the seventh they assumed the narrow cruciate form. In 1884 Mr. E. F. Fox and the late Colonel Jones repeated the experiment successfully. At the same time they both endeavoured to add the polydactylous character to different varieties of *Aspidium angulare*, and succeeded, the most marked of Mr. Fox's seedlings being polydactylous *congestum* forms, and those of Colonel Jones being polydactylous varieties of *divisolobum* and *lineare*; and a variegated *polydactylum* of Padley's variegated *angulare*. I had previously produced similar polydactylous forms in the Lady Fern. The endeavour to produce various golden Hart's-tongues, from using spores of different varieties mixed with those of a golden form, resulted in seedlings some of which have been brought to speak for themselves.

One of my more recent experiments was the endeavour to ascertain whether more than one plant could be produced from a single prothallus. It had been noticed over and over again that in trying to separate seedlings into single plants it often occurred that some were so closely connected that it required great skill in separating them. When these grew to maturity most of them were seen to resemble each other, and probably had sprung from one prothallus, and this was well seen, more especially in three plants of a very distinct variety being a copy of each other.

Four years ago I sowed spores very thinly, so as to allow them room to expand. When these prothalli were fully grown a number were cut with a sharp knife into two, three, and four pieces and replanted, and those simply cut into two produced two plants, but when divided into four they have not produced fronds; they have increased in size, and though it is more than

two years since they were divided, are yet without fronds. It seems probable that the male organs may be on the one portion and the females on another ; hence the absence of fronds. Plants raised from a split prothallus are not, however, always alike ; occasionally they are strikingly distinct, though mostly bearing a resemblance to each other.

Increased or diminished development in fronds, pinnæ, or pinnules in endless directions will eventually add enormously to the varieties cultivated. The energies are often expended in certain directions. A large capitate head may be at the expense of the tassels of the pinnæ, or large tasselled pinnæ at the expense of the capitate head. A well-developed plumose form is more or less sterile ; the energy is directed in subdivision, and in consequence the texture is thinner, and there does not appear to be sufficient strength left to produce spores. On rare occasions there is a thickening in this texture on parts of the frond, and there sori are formed. In the case of the plumose form of the Hart's-tongue known as *crispum*, occasionally a number of plants, all sterile, are found in close proximity ; the late Colonel Jones found twenty-nine near Shirenewton, and Major Cowburn has found nineteen at Dennil Hill. Marvellous wild finds are usually solitary examples. The *Nephrodium paleaceum* var. *cristatum* found in the West of England was a single specimen, and no second example has been discovered ; yet a somewhat similar form has more recently, however, been found in North Wales, the two differing in the one being flat-crested and the other bunch-crested.

An increase in the strength of a plumose form would thicken the texture of the frond, and enable it to bear spores. Experiments have been tried on flowering plants as well as on Ferns, in the hope of procuring this strengthening result. Taking into consideration that a vast number of antheridia are requisite to fertilise a plant, the single Dahlia was selected as the flowering example, and capitate forms of *Aspidium angulare* as the Fern to be experimented upon. As it was wished to use six times as much pollen of a white Dahlia as that of a pink one, six small brushes were filled with the pollen of a white flower, and one from that which was pink, the whole being collected on a larger brush and then repeatedly applied to a white flower. The result in the seedlings was 87 per cent. of white flowers ;

whilst equal parts of white and pink *pollen* only gave 44 per cent. of white flowers. The second experiment with *Aspidium angulare*, in order to increase size as well as greater development, could only be done by using mixed spores in certain proportions—*i.e.* six times the number of spores from the largest crested varieties to one of a variety of larger growth, if sown together, was thought might increase the vigour of the plant, and thus produce a Fern having a larger size and a greater crest. There are several of the plants here, and I might have brought many more that give great promise of a successful issue, though they are as yet only infants. Strength added in this way might develop a tripinnate frond, so that the lobes of the pinnules should even become stalked, crested, and more divided.

Investigations such as these are not confined to Ferns ; they extend to flowering plants, and a great future is before the students who prosecute these inquiries. Those who give themselves up to scientific investigations cannot avoid receiving adverse expressions from unbelievers ; but doubt *may* change to belief, for sooner or later truth will assert itself. The reasoning which at first seemed cloudy and obscure may, by the multiplication of a chain of evidence, clear away these clouds, and then the sun, the emblem of truth, will shine in all his glory.

DISCUSSION.

Dr. SCOTT said that the most surprising statements in Mr. Lowe's interesting paper related to the combination of the characters of several varieties in a single individual in cases where the spores of the varieties in question had been sown together. If the result were really due to multiple hybridisation it would involve the fertilisation of an ovum by several spermatozooids, each contributing somewhat of its own character to the offspring. This supposition contradicted all that was directly known as to fertilisation in Ferns, in which it had always been found that only a single spermatozoid fused with the ovum. Instances of multiple fertilisation in plants were rare ; Strasburger found that in certain Orchids both the male generative nuclei sometimes fused with the ovum, but this instance was only

remotely analogous, as the two generative nuclei were derived from the same pollen-grains. Among the lower plants a few cases of the kind were known. It had been stated that in *Fucus* more than one spermatozoid united with the ovum, but recent observations had rendered this very doubtful.

Mr. Lowe's explanation of the facts could hardly be accepted by botanists until direct microscopic observation had established the possibility of multiple fertilisation in Ferns.

PLUMOSE BRITISH FERNS.

By MR. C. T. DRUERY, F.L.S.

IN selecting for the subject of my paper the plumose section of the varieties of our indigenous Ferns, I have been actuated to some extent by my own special taste, and also by the conviction that, so far as the mere instinctive admiration for the beautiful is concerned, that taste is generally shared by the friends who visit my collection. With the ladies especially I find the conventional expressions of admiration unmistakably emphasised into sincerity when the delicately cut, yet normally shaped fronds of the plumose Lady Ferns or Shield Ferns are under examination. On the other hand, when I parade for their delectation the heavily crested forms of the same species, laying special stress upon those which are furthest removed from the common type, almost invariably there is some allusion, more or less broad, to that ornament of our kitchen-gardens, but hardly of our conservatories, "Parsley" —even that marvel of cristation, *Athyrium filix-femina* var. *acrocladon*, and its still more extraordinary progeny, provoking this, from my point of view, degrading comparison.

Another and probably more potent reason for my choice lies in the fact that I have been exceptionally fortunate in raising, in a very unexpected manner, some very beautiful new plumose *Athyria*, a few of which I have exhibited in company with their progenitors in that family and various plumose forms of other species.

The form of variation known as "plumation" consists in an

abnormally leafy or feathery development of the fronds, accompanied by partial or entire barrenness, the general normal outline being retained or merely widened. It has been found to characterise specially the three species of *Athyrium filix-femina*, or the Lady Fern; *Polystichum angulare*, or the soft prickly Shield Fern; and *Scolopendrium vulgare*, or the common Hart's-tongue, in all of which species several distinct forms have been found wild. Among the other genera the Lastreas, considering the large number of other varieties their several species have yielded, have afforded only two true plumose forms—the soft Male Fern giving *Lastrea filix-mas Bollandiæ* and the Mountain Lastrea, or Lemon-scented Buckler Fern, a very fair form indeed. Both, however, fall far short in their foliaceous development or decomposite cutting in comparison with the best forms of the other three species named. Among the smaller species, the Sea Spleenwort (*Asplenium marinum*) and the common Maidenhair Spleenwort (*Asp. trichomanes*) have each yielded true plumose varieties. *Asp. t. incisum* is especially fine, and, varying slightly in form, has been found in several localities. That found by Mr. Clapham is the best. The Hard Fern (*Blechnum spicant*) has yielded, so far, no wild plumose form, but one has been raised under cultivation and named, at too early a stage probably, *B. s. serratum*, Airey No. 1. The specimen of this which I exhibit is well worthy of note, being sub-tripinnate, or divided thrice. The Maidenhair, *Ad. cap. veneris* var. *Cornubiense*, is the plumose form of that species, and is the counterpart of *Ad. Farleyense* on a smaller scale. The common Polypody (*P. vulgare*) has afforded several varieties. *P. v. cambricum*, or the Welsh Polypody, has been found in several places, and a much more developed form of it, *P. v. Prestonii*, was discovered in the Lake district. *P. v. plumosum* (Hadwin) is another of less advanced type. Incidentally I may remark that the various names given to these true plumose forms afford a proof that Fern nomenclature is far from perfect.

In the common Hart's-tongue (*Scolopendrium vulgare*) we have the plumose form exemplified in the numerous finds of *crispum*, of which the major number are perfectly barren. In these the normal strap-shaped frond is transformed into a deeply puckered frill, which, in extreme cases, attains a width of five inches. The form found by Dr. Wills in Dorsetshire is

certainly the finest. I exhibit several specimens of this beautiful form. Strange to say, although perfectly barren, and quite incapable, therefore, of widespread propagation through their spores, a considerable number of independent plants have been found in various localities. Colonel A. M. Jones found, in one lane in Monmouthshire, twelve on one occasion, and no less than seventeen on another, attributable, possibly, to some normal, or apparently normal, plant in the vicinity yielding abnormal spores. Some decidedly plumose forms have been found which are fairly fertile; they lose their foliaceous character, however, in proportion to their fertility. An intermediate variety, *S. v. undulatum rigidum*, has been found by Messrs. Stansfield, of Sale, to yield a percentage of very fine fimbriate *crispums* through its spores. These have lacinate edges to the frill, and are sparsely fertile. There seems to be considerable latent reproductive energy in the bases of the stalks of these forms, as, cut into half-inch lengths and inserted in sandy soil, each piece is fairly sure to yield two or three plants, small white warty knobs developing at first, and eventually producing true specimens. *Polystichum angulare Pateyii*, a fine plumose form, but of delicate constitution, is perfectly barren, but the other plumose forms of that species are not so. In the Lady Fern (*Athyrium filix-femina*) I believe all the plumose forms produce spores, generally in nonindusiate patches, à la Polypodium; and in the Axminster and *divaricatum* plumosums small bulbils are sometimes developed among the sori, from which plants can be raised by careful pegging down. The two most distinct plumose Athyria are *plumosum* Horsfall, found in Yorkshire, and *plumosum* Axminster, found near that town. Of these Horsfall is very constant under cultivation, and has, so far as we know, yielded no sub-variety. A very similar form has, however, yielded *A. f.-f. kalothrix*, or "beautiful hair"—perhaps, if we exclude exotic Filmy Ferns, the most delicately made Fern known. I exhibit a plant of this, upon which will be noted a reverted frond, showing us the parental type which is also produced occasionally from its spores. The Axminster variety has sported freely, yielding some very fine forms, and in one special instance has afforded so wide a range of beautifully distinct plumose plants as certainly to merit careful record.

In 1883 I discovered upon *A. f.-f. divaricatum* the existence of

bulbils associated with the spores, and as the result of some inquiries a portion of a frond of *A. f.-f. plumosum elegans* (Parsons), a finer-cut seedling from the Axminster, was sent to me. In this Fern it will be borne in mind that there is not the slightest trace of crestring, and yet as the result of a sowing of spores *entirely without admixture with spores of other varieties*, fully 90 per cent. of the progeny were heavily crested and of very similar type to each other. One of the best of these is seen in No. 2,* exhibited; most of the others, though heavily tasselled, had considerable irregularity in the pinnæ, which detracted from their beauty. Two only of the batch reproduced the parental type truly; one of these is No. 3. Among the remainder were several superior forms, characterised by greater regularity of crestring and finer cutting; one of these is No. 4. Finally, one plant appeared whose peculiar delicacy of detail and symmetry fully entitled it to the name of *plumosum superbum*. This figures as No. 1.

In this sowing it will be observed that the spores of a perfectly uncrested plumose form yielded *without crossing* over 90 per cent. of crested offspring and only two of parental type. The possible admixture of a few deposited chance spores could not have crossed so many plants or produced such similarity of type.

We now go a generation further. *A. f.-f. superbum* yielded in 1887 a very few spores in minute patches, which were carefully sown, with striking results. The equilibrium of the spores had now obviously become entirely upset. Out of some 120 plants resulting, a score or more are quite devoid of crestring, but characterised by all the delicacy of cutting of *superbum*, which has stamped its special character upon the whole batch, with perhaps one exception, which reverts towards the Axminster, with infinitely finer cutting. This is numbered 5. A number of the plants show more or less irregularity, but they are still young, and I note a tendency to outgrow this defect. One only has so far declared a decided resemblance to *superbum* itself, but promises to be denser and more developed still than that. This is numbered 6. The uncrested forms differ much in detail (see Nos. 7, 8, and 9), all of which may certainly claim first rank, even in their young state, and as the tendency of plumose forms is to increase in delicacy of detail as they do in size, they may certainly be ex-

* The numbers in this and the following paragraph referred to growing specimens which Mr. Drucry had placed in a line on the table before him.—ED.

pected to hold their own in the future also. In No. 4, a sister plant to *superbum*, a singular example of local variation may be noted, two pinnae on one frond being quite distinct in character from the rest of the plant. In concluding my notes on this batch I would especially invite comparison between the uncrested types and No. 10, a *grandiceps* form, as affording possibly a unique case of wide variation in one batch of spores. It is worthy of note that Mr. J. H. Fitt, from whom I received the frond from which I raised the original batch, also made a sowing therefrom, with the same result of a large percentage of crested plants, minus, however, the *superbum*.

Reflecting upon these phenomena of creasing as associated with plumation, it seems to me that both are probably closely akin. In creasing we have a localised tendency to repeated fission and extension of growth on the apices of the fronds, pinnae, and even the pinnules, terminal tassels being thus formed. In plumation we have a generally distributed tendency towards simple fission and extension of all apices, resulting in a greater featheriness.

This idea may be better grasped by a minute inspection of the pinnulets or tertiary divisions. In the case of the common Lady Fern, it will be noticed that the minor subdivisions are provided with simple veins running to their blunt apices. In a pinnulet from the Axminster variety we find an immense advance and it will be noticed not only that the veins fork more than once, but that the apices in many cases show a distinct tendency to fork again. There are also forked veins running out to the sinus between the divisions, and forming small subsidiary divisions, which at a later stage would, I expect, bear spores and bulbils. A plant of the third generation shows more decided forking and extension, and with a peculiar tendency in the tips of the divisions to curve inwards, which gives a decided character to the variety. A pinnulet of one of the offspring of *superbum* shows a further advance in plumation and betrays its grandparents still by the inturned tips. Finally, the crest of a pinnule of *elegans cristatum*, a sister plant to *superbum*, shows the localised ramification of the veins, which constitutes creasing, in conjunction with the simple dichotomous forking and lengthening which produce plumation, and you will, I think, agree with me that no line can here be drawn between the two.

The equilibrium being disturbed and the tendency to division persisting, we may here have some explanation of the results we have been considering, viz. the production of crested plants from spores of uncrested plumose Ferns; while the tendency to revert now and again predominating, the equilibrium is re-established, and the normal outline, plus the finer cutting only, reappears. Of course I only put this forward hypothetically; perhaps others will direct their observations in the same channel, and either confirm or refute, as the case may be.

My paper on Plumation would be incomplete did I omit special reference to the very charming plumose form of *Poly-stichum angulare*, for which we are indebted to the wild finds and selective culture of the late Colonel A. M. Jones, and his colleague, Dr. E. J. Fox. Several specimens of these are exhibited, three forms being of exceptional beauty: *P. ang. plumosum laxum*, *densum*, and *robustum*. I learn from Dr. Fox, who raised these, that they are all the direct offspring of a far inferior wild find of Colonel Jones; so inferior, indeed, that it was only when a second sowing confirmed the first by identical results that Colonel Jones could be brought to credit the parentage.

Such forms as these and some of the plumose Athyria, which may worthily be associated with them, give us a glimpse of the British Ferns of the future, and amply support my contention that our native Fern varieties can compete with the finest exotics in decorative value, with the additional advantage of perfect hardiness and more economical culture.

DISCUSSION.

Prof. BOWER said this inquiry had now arrived at the stage when it might be put to a vigorous test. Perhaps the best way would be to cultivate certain "prothallia," and then to actually follow the whole process of development through, under the microscope. The next step would be to proceed in the same way as with Fungi. He thought the views put before the Conference that afternoon would make any man take the subject in hand to investigate.

Mr. STANSFIELD said he had experimented in the same way as Mr. Lowe with spores of the Axminster variety, with the result that a multifid character was produced. The spores were sown together, and great variety was shown in the progeny.

Not only was crested developed in the pinnules, but instead of a flat crest a round one was obtained. Another result, different from Mr. Drury's, was from sowing *plumosum elegans*. It did not result in any "crested," but in the development of the cutti of the pinnules.

HARDY FERNS, AND THEIR CULTIVATION.

By Mr. J. BIRKENHEAD, F.R.H.S.

THERE appears to be a prevailing idea that among hardy Ferns there is but little variety; those, however, who are well acquainted with this section of Ferns know how erroneous such an idea is.

British Ferns for many years have been receiving attention at the hands of Fern lovers; their haunts have been searched through and through, their spores have been collected and sown, with the result that while many exceedingly beautiful varieties have been found growing wild, and have been cared for and cultivated, many other equally beautiful kinds have been raised from spores, so that now the variety to be seen in hardy Ferns is as great as that in tender Ferns.

Hardy Ferns are worthy of the attention of everyone possessing a garden. They may be cultivated not only in the specially constructed fernery on a large scale, but they may be intermixed with shrubs in borders and in plantations; they may be planted in beds by themselves, or in nooks and corners and shady places where flowering plants cannot be induced to grow; indeed there are many places where flowering plants have been tried again and again with unsatisfactory results, causing disappointment and annoyance, which, if planted with Ferns, would have become as charming and interesting as any part of the garden.

But Ferns are not suitable merely to plant where nothing else will grow. There are some varieties possessing such exquisite beauty that they are worthy of the greatest care and attention, and the most conspicuous position they can have assigned them. Not only may they be utilised in the sunless positions referred to, but they are also very suitable for window-boxes outside and for cultivation as window plants inside. How

often you may see in windows miserable, lanky Geraniums, Fuchsias, and other plants struggling for existence, while Ferns in the same position would grow freely and present a beautiful and pleasing appearance.

Thus British and other hardy Ferns are suitable for cultivation in the dwelling-house; in window-boxes; in situations where flowering plants will not live; in the gardens of those who can give them a position exactly suiting their requirements of shade and shelter; in borders, beds, shrubberies, plantations, rockwork, or specially constructed ferneries. They are specially suitable for cultivation in unheated frames and cold greenhouses. The extra protection accorded the Ferns in such places will be much more than repaid by the additional beauty of foliage and colour they will exhibit under these more favourable conditions.

In the cultivation of hardy Ferns it will be found that a position shaded from the sun and sheltered from strong winds suits them the best. But although they should be shaded from the hot rays of the sun, they should have as much light as possible. If shaded too much they become weak, and do not grow so sturdy and bushy as they would with an abundance of light. They should not be crowded together, as they neither grow so well nor have they the pleasing appearance possessed by those which have more room in which to develop their fronds. Besides, when growing one into another, they lose their individuality, and their particular characters and forms are not so noticeable. Strong winds break their foliage; hence protection from these should be provided. Care exercised on these points in their culture will result in much greater success than when these matters are not attended to.

Ferns revel in moisture, and it is an essential both in the soil and in the atmosphere. A dry atmosphere prevents the perfect development of their fronds and minimises their beauty. If short of moisture at the roots they are checked in their growth; often their fronds shrivel and the plants die. Stagnant moisture is injurious to them, so that, although the soil in which they grow should be continually moist, it must be drained. Ferns planted on rockwork will require examining during dry weather, and should be watered when they require it. Probably the most favourable position for Ferns is a natural or specially constructed dell, where

they can have a certain and continual supply of moisture at the roots, and protection from strong winds, with shelter from trees overhead. Here they will grow luxuriantly, and prove a beautiful and interesting feature.

Some Ferns, as *Osmundas*, do well planted by a pond or running stream. They grow naturally in boggy and marshy situations, and attain an enormous size. Others, as *Asplenium trichomanes*, *A. ruta-muraria*, *Ceterach officinarum*, and *Polypodium vulgare*, will grow in drier positions, and are usually found wild in places where apparently they get but little water; but even they grow much more luxuriantly if supplied with moisture to their roots continually. *Athyrium filix-femina*, the *Lastreas*, *Polystichums*, and *Scolopendriums* all like an abundance of moisture in the soil.

To obtain the best results in the cultivation of hardy Ferns, not only should the above conditions of shade and moisture be attended to, but the soil in which they are to grow must be of suitable kind. Good loam should, of course, form the foundation; with this a good supply of sand should be intermixed to keep it open and help the drainage; to this good, well-decayed leaf-mould should be liberally added—for *Polypodiums* an extra supply being given, and in addition a little peat, with an extra quantity for *Osmundas*.

This is a compost in which all hardy Ferns will grow well when planted outside; but for Ferns in pots, instead of the common peat, the better kind, such as is generally used for stove and greenhouse plants, should be substituted.

Some of the British Ferns are rather difficult to cultivate, and often fail to grow satisfactorily when in pots, or even on rockwork. Those referred to more particularly are the Parsley (*Allosorus crispus*), the *Ceterach*, the Wall Rue (*Asplenium ruta-muraria*), the Forked Spleenwort (*Asplenium septentrionale*), the Alternate-leaved Spleenwort (*Asplenium alternifolium* or *germanicum*), the Holly Fern (*Polystichum Lonchitis*), and several other suchlike. If these Ferns are planted out in a cold frame, in the compost previously recommended, with the lights raised 2 or 3 inches so as to cause a current of air over them during the day, they will be found to grow much more satisfactorily, and quite as freely as in their native homes.

Among British Ferns there are some exceedingly beautiful

varieties, as may be seen in the fine collection now growing in the gardens at Kew; there are many others also which do not appear to be represented there at present, but by seeing those which are there anyone may gain a fairly good idea of the variety of form and beauty possessed by perfectly hardy British Ferns. The lovers of the curious forms also may find much to interest them among the Scolopendriums, Athyriums, Lastreas, Blechnums, and others.

Our native species are not very numerous, but many are very pretty and ornamental; and had they come from other countries, instead of being found wild in our own, they would, no doubt, be more highly esteemed. The species number about fifty, more or less according to how they are joined or separated by various authorities, but the wild and the cultivated varieties are simply innumerable. Some thousands of these have been named; they are of every conceivable shape and form, and they range in size from the tiny *Hymenophyllums* to the *Osmundas* and *Pteris aquilina*, which may be seen in wild luxuriance from 8 to 10 feet in height. Some of the North American species are perfectly hardy; and while a few of them are somewhat like species found in this country, others are quite distinct, possessing characteristics and a beauty entirely their own. Japan furnishes us with a few species which are quite hardy, and a few others that will live outside here, but require a little protection in winter. A few also are found elsewhere that do well in the outdoor ferneries of this country.

Having to treat my subject briefly, it will necessitate the leaving out of much interesting matter, and reference to those species and varieties only which are particularly noticeable for their beauty or peculiarity of form, and but a small proportion of these, as it would occupy a long time to merely enumerate those which are deserving of attention and worthy of cultivation.

There are three Filmy Ferns natives of Britain—*Trichomanes radicans*, *Hymenophyllum tunbridgense*, and *Hymenophyllum unilaterale* or *Wilsonii*. If these are planted outside it must be in a very damp, secluded position; for, although they will bear a low temperature, a dry atmosphere or lack of moisture at their roots is very injurious to them. They give most satisfaction when grown in an unheated frame, where they will bear eight or

ten degrees of frost without injury; in a cold greenhouse, under a glass shade, or in a fern-case they will grow luxuriantly.

The true British Maidenhair (*Adiantum capillus-veneris*) does not appear to be hardy enough to bear frost; it rarely, if ever, gives satisfaction when planted outside. It will grow in a cold greenhouse, but better still in a warm house, its varieties, *daphnites*, *grande*, *magnificum*, *cornubiense*, all requiring the same condition. *Asplenium marinum* (the Sea Spleenwort) and *A. lanceolatum* should receive the same treatment.

Allosorus crispus (the Mountain Parsley Fern) is the opposite in its requirements. This species cannot bear confinement; in its native habitats, where it grows in immense patches on the mountain sides, it is exposed to the full sun and every breeze that blows, to say nothing of the storms which rage in those localities; the nearer its condition under cultivation approaches this the better it appears to like it.

The Alternate-leaved Spleenwort (*Asplenium germanicum*), the Forked Spleenwort (*Asplenium septentrionale*), the Wall Rue (*A. ruta-muraria*) are all dwarf in habit and very interesting, but they cannot be said to possess much beauty. *Asplenium Adiantum nigrum* (the black Maidenhair Spleenwort) grows rather larger, and has dark green glossy fronds. It is a pretty Fern, but the variety *acutum*, being thinner in texture, is more graceful in appearance. *Asplenium trichomanes* is also a pretty little Fern, growing in dense clumps and found in great abundance on old walls and bridges, in some instances completely clothing them with foliage. In its company the Wall Rue is found in profusion, causing one to wonder how they manage to live at all apparently without moisture or food. There is a nicely crested variety of *Asp. trichomanes* named *cristatum*, but not so easily grown; another variety, *A. t. incisum*, is a beautiful Fern, having its pinnules deeply cut. *A. viride* is similar in appearance to *A. trichomanes*, but has a green instead of a black stem. These and *Ceterach officinarum* (the Scaly Spleenwort) are all dwarf and interesting; the latter has the under-surface of its fronds covered with scales, at first light-coloured, afterwards becoming brown, from which it is known among unbotanical observers as "the Rusty Back."

Cystopteris fragilis (the Bladder Fern) is a light, delicate-looking species, very pretty, but dwarf. *C. regia* is more

finely cut, while *C. montana* has triangular fronds, quite dissimilar to the others. These are all suitable for planting on rockwork.

Blechnum spicant (the Hard Fern) is of larger growth. It is an evergreen species, producing two distinct kinds of fronds, the barren usually lying close to the ground, the fertile fronds, much contracted, standing upright. This species grows in large clumps, and is very ornamental as seen in many places wild. There are a number of distinct varieties, as *cristatum*, a pretty crested form; *Maunderii*, like a green ball; *trinervo coronans*, peculiarly crested; *serratum*, *strictum*, and others, not omitting the beautiful *concinnum*, with narrow, crimped fronds.

The Lady Fern (*Athyrium filix-fœmina*) is one of the most graceful of hardy Ferns, and one of the most prolific in production of varieties. Not only have many varieties been found wild, but from spores there have been so many others raised that we may say of them their name is legion. If it were not impossible, it would be unwise to give names to every one of these, though they differ from others in some respects.

In the wonderful power of production and variation possessed and exhibited by this and other British species we have a guarantee of many yet unseen beauties of the Fern world. If cultivators, raisers, and hunters of Ferns will exercise a wise discretion in selecting only the most distinct and beautiful as well as the most remarkable in other respects, at the same time discarding all others, the hardy fernery may be replete with most interesting subjects, and there will be no lack of handsome kinds which will bear comparison with the more tender Ferns of other countries.

Among *Athyriums* there may be mentioned the exceedingly beautiful *plumosum*, of which there are several distinct forms, which produce in great profusion large plume-like fronds, forming masses of waving green foliage. One of the most lovely of these is *plumosum elegans*, with its exquisite fronds of pale green cut into fine segments—a perfect picture. *A. f.-f. plumosum multifidum*, a heavily crested variety, is also very handsome, the weight of the crests giving to the already plume-like foliage an additional grace.

A. f.-f. kalothrix has its foliage so finely cut, and possesses such a peculiar, somewhat glossy appearance, that a little distance away

it looks almost like a green mist. *A. f. f. Victoriae*, styled the "Queen of Lady Ferns," is a most distinct variety; its fronds (from 2 to 3 feet long) arching gracefully, its narrow pinnæ crossing each other like lattice-work, its pinnæ slightly and the apex of the frond more heavily crested, it is at once the most remarkable of this section, and quite alone in its peculiar beauty.

A. setigerum is another handsome variety, very bristly in appearance; several of its crested forms are specially attractive.

A. Frizelliae, with its narrow, slender fronds only half an inch or so wide, is very pretty, but unfortunately not very constant. *A. F. cristatum* is very distinct, being crested; while *A. Applebyanum*, which produces very narrow fronds 2 feet long and heavily crested, forms a handsome plant. *A. Fieldiae* is heavier in appearance than *Frizelliae*, its fronds being longer and its pinnules cruciform.

A. Pritchardii and *A. P. cristatum* are in the same style, but produce longer fronds, the pinnæ more decidedly cruciform than *Fieldiae*, the point of the frond being drawn out, and in the case of *cristatum* bearing a crest. *A. Craigii* and *Howardianum* are very handsome, the one having a red and the other a green stem, the pinnæ depauperated and crested. *A. acrocladon* is a marvellously crested variety; its fronds grow from 12 to 15 inches in length, being branched and crested to such a degree that it becomes a dense bush of fronds.

Athy. crispum is a dwarf variety, also much branched and crested. *A. Edwardsii* is dwarf and much congested. *A. apicale* is a lovely dwarf crested variety. *A. corymbiferum* is a very handsome form, its fronds being very regular in outline, all the pinnæ crested, and the apex of the frond bearing a heavier crest.

The Lastreas, like the Athyriums, are very numerous and distinct, though the tendency to produce varieties is in the former more restricted, but they are much more constant. They, so to speak, do not change their minds as some of the Lady Ferns are prone to do, but, having developed a particular character, they may be relied upon to retain it from year to year.

Of the three distinct forms of the Male Fern, the one now distinguished by the name *pseudo-mas* is most attractive, and although the commoner *filix-mas* grows luxuriantly, and makes a fine specimen, the *pseudo-mas* has a more symmetrical habit of growth; its fronds are of a pleasing yellowish-green, and

densely covered at their bases by golden-yellow scales. In spring, when growth is commencing, this is particularly noticeable. The varieties worthy of mention among the many that are now in cultivation are *Barnesii*, a fine, tall-growing kind; *fluctuosa* or *crispatisissima*, compact in habit, with very crimped fronds; *grandiceps*, bearing heavy crests and forming immense clumps; *cristata*, a handsome variety, its fronds regular in shape, with crests along each side and at the point; *cristata angustata*, a narrow-fronded, crested form; the very handsome *fimbriata cristata*, remarkably distinct; *ramosissima*, exceedingly pretty branched, crested, and compact in habit; and *Lastrea propinqua cristata Barnesii*, also very distinct and handsome.

Lastrea Oreopteris or *montana*, the mountain Buckler Fern, is a pretty species, while its varieties, *Barnesii* with narrow fronds, *cristata*, and particularly *coronans* and *ramo-coronans*, are distinct, the latter being very beautiful.

Lastrea cœmula, the Hay-scented Fern, and its variety *cris-tata* are very pretty Ferns.

Osmunda regalis is one of the most noble of hardy Ferns, and is well named the Royal Fern. In some places this species may be seen in immense clumps, 6 to 8 feet high or more, its spikes of spore-cases developed at the tips of the fronds giving the plant a peculiar appearance and gaining for it the common name of "the Flowering Fern." There is a very handsome crested variety, usually lighter in colour and more graceful in habit, which under favourable conditions makes a beautiful specimen.

The Oak Fern (*Polypodium Dryopteris*) and the Beech Fern (*P. Phegopteris*) are so well known as not to require more than passing notice, the former, however, deserving an extra note of praise for its lovely pale green foliage, carpeting the ground where it grows.

The varieties of *Polypodium vulgare* deserving notice are numerous. Among them there are *cambricum*, with its deeply cut leafy pinnules, and the even more handsome *cambricum Prestonii*; *semilacerum* with its deeply lacerated fronds; *omni-lacerum*, finely serrated; *pulcherrimum*, very lovely; *bifidum*, *bifidum-cristatum*, *cristatum*, and *multifido-cristatum*, all crested; *grandiceps*, heavily crested; the finely cut *elegantissimum*; the still finer *cornubiense Fowlerii*, and the selected form of this, the most beautiful *trichomanoides*.

The Polystichums are among the most handsome of hardy Ferns, and, being evergreen, are additionally valuable for ferneries. *P. aculeatum* and *P. angulare* have both produced numerous varieties. While those of *aculeatum* appear harder, stiffer, and better calculated to stand the weather, those of *angulare* are softer, more graceful and pleasing in appearance. What can be more charming than those exquisitely lovely *divisilobums*—*laxum*, *densum*, and *plumosum*? Words fail to convey an adequate idea of the beauty of these gems, and others closely related to them as seen in some ferneries. Their fronds, 2 feet or more long, broad at the base, tapering to a point, cut into minute segments, densely overlapping each other, mossy in appearance, of lovely light green—they must be seen to be appreciated.

Then there are the noble *plumosums*, the heavily crested *grandiceps* of several forms, the various *cristatums*, the finely cut *acutilobum*, the charming *gracile*, the lovely *venustum*, the curious *Wakleyanum* with cruciform pinnæ, and many others worthy of a place in the most choice collection.

The Scolopendriums are the most variable of all Ferns; to their eccentricities there is no limit. Fortunately some of the most beautiful are constant, and from year to year retain their special characters.

The various forms of *crispum* are very beautiful, their fronds being deeply frilled, and it is difficult to say whether the narrow or broad fronded forms are the more lovely. *Crispum fimbriatum* is specially pretty when in character; *cristulatum* is a very distinct and handsome crested variety, forming a compact head of crisp crests; *grandiceps* is a heavily crested variety; *ramo-marginatum* is very beautiful, being branched and crested, the fronds slightly wavy and graceful; *Coolingii* and others like it are compact, dwarf, and much crested; while *densum* is of a dwarf, dense habit of growth, branched and crested to such a degree that it looks like a small ball of green foliage.

By taking the plain *Scolopendrium vulgare*, a handsome Fern when growing under favourable conditions, and trying to imagine every degree of serration, laceration, and cutting up of the frond; every degree of unevenness, from the slightly wavy to the deeply gofferred; every degree of roughness of surface, from the perfectly smooth to that like a toad's back; every degree of cresting, from

the simple fork to the heavy crests of *grandiceps*; every degree of branching, from the one division to that in which the plant is a mass of branches difficult to separate into fronds; fronds drawn out and fronds abruptly terminated; narrow fronds, broad fronds, fronds with horns below, others with horns above, others again with pockets; fronds bearing bulbils at the edges, and others with plants on the surface; fronds deformed, every one being different from every other on the same plant—in fact, imagine every variation in form beautiful and ugly, and an idea may be obtained of the appearance presented by the 1,000 or 2,000 varieties of *Scolopendriums*.

Many of the North American Ferns are equally as hardy as our English ones. There appears to be in them an utter absence of the tendency to crest, and sport in other ways, so common in our native species. During the last twenty years I have imported many thousands of North American Ferns, and during that time have only met with two plants showing any tendency to crest, both *Polystichum acrostichoides*. One was simply forked, and after the first year reverted to the normal form; the other developed into a fine crested plant, which I exhibited in London in June 1883, and for which a first-class certificate was awarded by the Royal Horticultural Society and a certificate of merit by the Royal Botanic Society. Up to the present time, however, all efforts to propagate this variety from spores have been without result.

It appears that the first exotic Ferns brought to this country were from North America—the exceedingly beautiful *Adiantum pedatum* and *Cystopteris bulbifera* as long ago as 1628; *Asplenium (Camptosorus) rhizophyllum* was brought in 1680, and *Onoclea sensibilis* in 1699. *Adiantum pedatum* is perfectly hardy, but its fronds produced in the early spring are liable to be caught by the late frosts; but the fronds which come up subsequently develop very beautifully when sheltered from the strong winds and shaded from the sun. In such a position a clump of this lovely Fern is very charming. It produces fronds 2 feet in height, spreading, circular in outline, light and graceful, of pale green colour, with deeply glaucous stems. As a cold greenhouse Fern it is not surpassed by any other, and it is just as much at home, and grows even more freely, in a warm greenhouse or stove. *Onoclea sensibilis* is a very handsome species. It produces large

fronds which appear like Oak-leaves attached to the upper part of the stem. The colour is light green. The fertile fronds are quite distinct, being simply a stem bearing on the upper 2 inches clusters of hard round spore-cases. It is a rapid grower, its rhizomes spreading quickly, and soon producing a dense clump of foliage. It requires shade from the sun and shelter from the wind, or its foliage is soon injured, being, as its name implies, very sensitive to these influences.

Osmunda cinnamomea is a distinct and ornamental Fern, quite unlike our *Osmunda*. Its fertile fronds are produced in spring in the centre of the plant, standing erect, destitute of leafage, the spore-cases clustered together in the 3 or 4 inches of the upper part of the stem. As the spores mature the cases become the colour of cinnamon, and give a very attractive appearance to the plant, but they soon shrivel and die away. The spores when collected are like beautiful green powder. The barren fronds are spreading, and being produced freely, the plants form nice specimens.

Probably the most beautiful *Osmunda* in existence is *interrupta*, otherwise known as *Claytoniana*, which produces rich, velvety-looking fronds of pale green. Its fertile fronds bear the spore-cases midway of the frond, where several pairs of pinnæ, instead of developing as the other leafy part, become spore-cases. These in time turn brown, shrivel up, and the frond then has the appearance of having been interrupted in its development, and thus receives its name *interrupta*. The barren fronds, perfect in their development, are spreading in habit, and the plants are exceedingly pretty.

Osmunda gracilis is a light, graceful, and pretty form of *regalis*. Some plants have red and others green leaf-stalks, those with red stems being particularly attractive.

Struthiopteris pennsylvanica is a strong-growing ornamental Fern, its habit of growth suggesting its common name, "the Shuttlecock Fern," and the peculiarly curled pinnæ of the fronds when young suggesting its other name, "Ostrich Feather" Fern.

Polystichum munitum is a handsome evergreen Fern, which grows to a large size, and resembles to a certain extent a Holly Fern. In California this species attains such a size that clumps are often seen 5 to 6 feet across and 4 feet or more in height.

Polystichum acrostichoides is a distinct and very hardy species; the variety *incisum* is very pretty.

Lastrea Goldiana, *L. intermedia*, *L. marginale*, *Polystichum Braunii*, *Woodwardia angustifolia*, and *W. virginica* are all very distinct. *Phegopteris hexagonoptera* is like a large Beech Fern, deeply cut. *Aspidium nevadense* is of a pale delicate green colour, its fronds emitting a pleasing perfume when touched. *Dennstaedtia punctilobula* is also an attractive Fern. *Lastrea fragrans*, a dwarf compact species, with its strongly Violet-scented fronds, is neat and pleasing in appearance.

These, with several of the Woodsias and a number of others which bear a strong resemblance to some of our British species, are the most hardy and suitable of the North American Ferns for outside cultivation in this country.

From Japan there come the glossy-leaved *Cyrtomium falcatum*; its duller-leaved relatives, *C. Fortuneii* and *C. Caryotidium*; the handsome bright glossy *Polystichum setosum*; the leathery-fronded *Lastrea Sieboldii*, *L. opaca*, *L. varia*, *L. atrata*; the very distinct *L. prolifica*, which bears crowds of little bulbils on its fronds; the very handsome *Polystichum concavum*; the *Woodwardia orientalis*, also bearing young plants in large numbers on its long spreading fronds; *W. japonica*, and *Lastrea decurrens*. These, except the last, are all evergreen when protected from frost, and hardy enough to bear our winters in most parts of England, unless the situation is bleak and unfavourable. It is nevertheless advisable to put some little protection about them; it will not do any harm even if not actually required.

Struthiopteris germanica, a European Fern, resembles the American *S. pennsylvanica*, but is smaller and neater in appearance. *Lomaria alpina* and *L. crenulata* are hardy dwarf-growing, creeping kinds, and *Lomaria chilense* is a large-growing, leathery-fronded species, very ornamental.

There are a few other Exotics which may be hardy enough for outside cultivation in some parts, but not in others; but, leaving these out, there is clearly an immense field for selection of beautiful and ornamental hardy Ferns, not to mention the curious and, from one point of view, less attractive, though none the less interesting varieties.

Given the conditions mentioned earlier on, hardy Ferns, without doubt, will prove a source of very great pleasure to those

who cultivate them, and for unheated greenhouses, particularly those which do not get the sun, they will prove the most satisfactory plants to cultivate, and will develop a wonderful degree of beauty when so protected.

AMERICAN FRUIT-EVAPORATORS AND EVAPORATING.

By Mr. EDWARD W. BADGER, F.R.H.S.

[Read August 12, 1890.]

MOST growers of hardy fruits in this country have found that the years in which the most plentiful crops are produced are not usually the most profitable years. The glut of fruit then sent into our markets so lowers prices that the cost of gathering, carriage, and marketing invariably leaves little or nothing for the grower. One consequence is that much good fruit remains ungathered, or is otherwise wasted, for want of some mode of dealing with it that would preserve it, and enable growers to select their own time for sending it to market, and thereby tend to prevent prices going down to a profitless point, as they often do under existing circumstances.

American fruit-growers have suffered from the same cause, much as we have done; but more than twenty years ago they applied themselves with characteristic energy to find out a way of combating the difficulty, and it was not long before it was discovered that there *is* a way of treating fruit, for which a profitable sale cannot be found in a fresh state, which enables the grower to convert every pound of it into money, and avoids glutting the market with a perishable commodity. My purpose this afternoon is to describe the American mode of procedure, which is in use in all the fruit-growing States so successfully that it has caused an immense increase in fruit-growing, and made it not only a very large, but a more reliable and profitable industry than it was previously. It is a method applicable to all sorts of hardy fruits—apples, pears, plums, cherries, apricots, peaches, and even such soft kinds as raspberries and strawberries. By its aid fruit can be cheaply preserved in a wholesome and saleable condition for a year or more. The method is known in America as “fruit-evaporating,” and the apparatus by which

the work is done is called an "evaporator." In the course of this paper I hope to give you such a sufficiently clear description of this apparatus, and the mode of using it, as will convey accurate ideas about it. I shall also endeavour to show in what the merit and advantages of evaporating consist, and shall place before you such other information on the subject as I have gleaned from various sources.

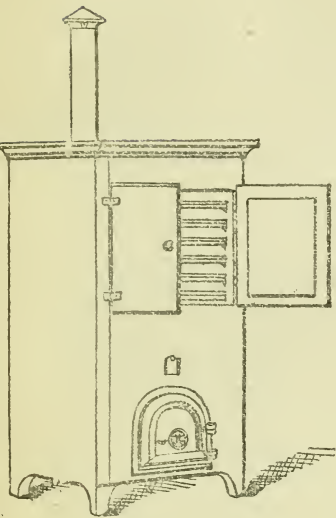


Fig. 34.

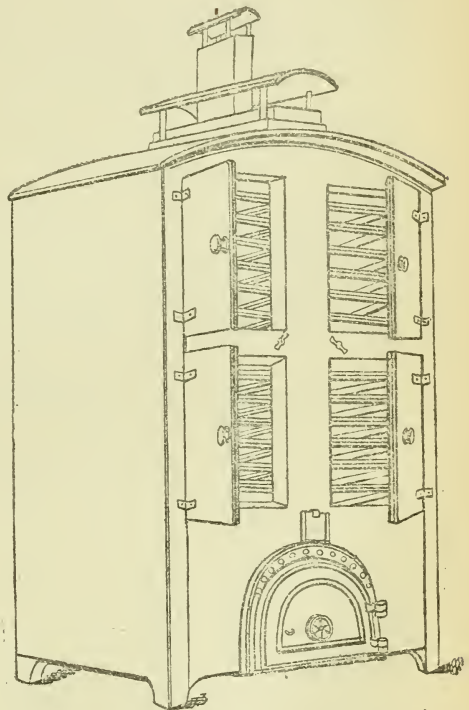


Fig. 35.

There are many manufacturers of fruit-evaporators in America, and each maker claims that his apparatus is the most efficient. But, whatever differences there may be between one evaporator and another, they may on this occasion be classified into two kinds. I have had outline sketches made which I think will convey to you a more precise and better idea of what these two types are like as to appearance (and to some extent where they differ) than a mere description would.

Fig. 34 and fig. 35 represent what we may call the

“upright” or vertical type, which is the one made by most manufacturers. Fig. 36 represents the other type, and in that, as you will see, the hot-air chamber is not vertical, but in an inclined plane at a slight angle from the stove or furnace.

It is necessary to point out that evaporated fruit must not be confounded with sun-dried or kiln-dried fruit; the latter are both very inferior in quality, and are in a different chemical state. Sun-drying is still much used in California and elsewhere, but is being rapidly superseded by the more scientific process of evaporation. The description of the chemistry of this process which I am about to submit to you I have selected as being the best I am acquainted with, and for which I am indebted to an eminent American scientist, Dr. J. F. Symons, of Fayetteville, Arkansas. It is the account he gave to the “South-West Association of Fruit and Vegetable Evaporators” at Springfield, Mo., and will, I hope, afford useful information as to the reasons why properly evaporated fruits are superior to those which are sun-dried or kiln-dried. Dr. Symons says:—

I will now describe the process of *true evaporation*. It has been found that by removing a part of the water rapidly, in swift-moving currents of air, heated from 240° F., a different product is the result, wholly unlike either the fresh or sun-dried fruit, and which will keep better, is more digestible and nutritious, is less acid, and will sell for more in the market. But if, after having heated the air hot enough, there is not sufficient circulation, or the currents not rapid enough, the fruit will cook and then dry, or burn the same as in a close oven. Apples will cook in boiling water at a temperature of only 212° F., or bake in an oven at 225° F.; but if the heated air circulates fast enough, the fruit will not cook or burn or become itself heated to the temperature indicated by the thermometer, even at 300° F., for the evaporation of the water is a cooling process, and every particle of vapour leaving the minute cells which contained it carries with it also a large amount of caloric in a latent form, and thus keeps the heat of the apples far below the surrounding air. The chemical changes which belong to truly evaporated fruit will now begin, and the albumen, instead of being slowly dried, is coagulated precisely the same as in an egg when boiled. The soluble starch existing in all the fruit, and composed of $C_6H_{10}O_5$, will, if the heat is high enough, combine with one equivalent of water (H_2O), so that now we have an entirely different compound, to wit, glucose, or fruit sugar, which will assist in the preservation of the fruit, instead of being liable to decomposition as the dried starch is in sun-dried or slowly dried product.

All the pectine, or fruit jelly, remains in the cells undecomposed, or is left upon the surface by the evaporation of the water in which it was dissolved, and may be seen condensed upon the surface, instead of being decomposed, and passing on with the starch and gluten into the acetic fermentation. The diastase or saccharine ferment contained in

all fruit, and which is the primary cause of its decay, has been rendered inoperative, and all germs of animal or vegetable life have been destroyed by the high heat. It is by this chemical change which I have briefly described, in uniting a part of the water already contained in the fruit with the fruit starch, that these *truly* evaporated products are rendered more wholesome, more digestible, more indestructible, and are thereby made more valuable, not only as articles of food, but because they are not subject to deterioration and loss. And it is also the reason why a bushel of apples will make more pounds of evaporated fruit than can be made by sun-drying it, as a portion of the contained water which would otherwise be lost is retained by combining with the starch to form glucose, and the carbonic acid, which is always lost in the slow decomposition resulting from sun-drying, is retained in its

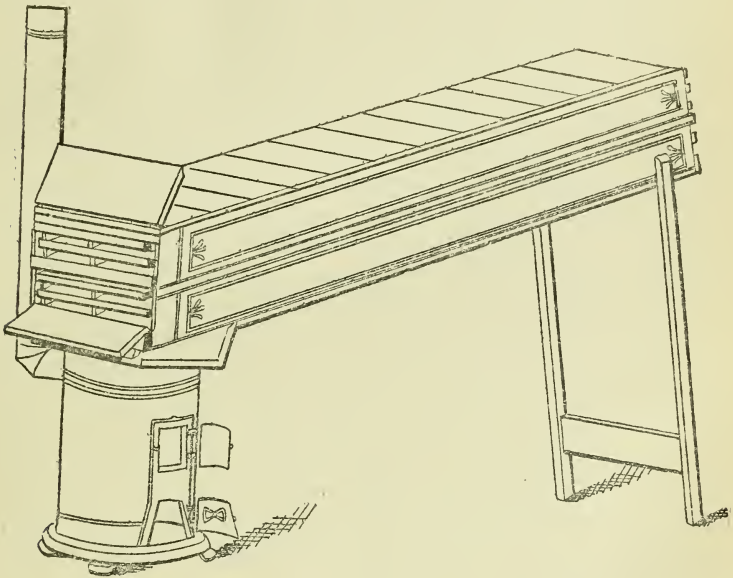


Fig. 36.

natural combination with the other substances composing the fruit, and hence it is heavier. These profitable and healthful chemical changes which I have mentioned are all in accordance with the laws of nature, and are certain to take place if the necessary conditions of heat and air, as I have detailed them, are properly supplied; otherwise you will have a different product, and no matter how fine your apples, how perfect your paring, coring, and trimming, or how white you may have bleached them, you have not made truly evaporated fruit, and no matter how many have been deceived by its bright colour, or full weight, or fancy packing, your fruit will not stand the test of long keeping in warm, damp weather. The natural starch, gluten, and albumen of the fruit, instead of being cured, or made indestructible by

the chemical changes which constitute the difference between the evaporated and dried fruits, will absorb moisture from the air, will swell or increase in bulk, and be attacked by mould, will absorb additional oxygen, and finally sour and decay.

The mode of preparing apples for drying in an evaporator is, first, to pare them, then to remove the core, and finally to cut them into slices or rings. It is customary now to submit the pared apple before slicing to the fumes of sulphur, which process is called "bleaching," the object being to prevent the discoloration of the fruit, which is nearly certain to take place unless the fruit is placed in the heated evaporator directly it is cut. The bleaching process is said to improve the appearance of the fruit, and not to injure its flavour. Paring, coring, and slicing are done very rapidly by ingenious machines which are to be bought at a moderate price. The prepared fruit is then placed on wire trays, made to fit inside the drying-chamber of the evaporator, and there remains until the whole of the moisture has been abstracted. The time occupied in doing this varies from $2\frac{1}{2}$ hours to 4 or even 5 hours, according to the kind of apples operated upon. Thus an American apple known as "Roxbury Russet" requires only $2\frac{1}{2}$ hours; "Baldwins," $3\frac{1}{4}$ hours; the kind called "King," 4 hours, and so on. After passing through the evaporator the next thing is to pack the dried fruit in neat boxes which hold 25, 50, or 75 lbs. These boxes are lined with paper: 50-lb. boxes are those mostly used. They are 24 inches long, 12 inches deep, and 12 inches wide; they are made of $\frac{1}{2}$ -inch stuff (with ends 1 inch), poplar wood being preferred. The evaporated fruit, before being used for making pies, tarts, compotes, &c., is soaked in water for a sufficient length of time to swell to nearly its normal bulk.

I shall now describe what an evaporator is like, and shall commence with a kind of which more than twenty thousand have been sold. This is the "Zimmerman," manufactured by the Zimmerman Machine Company at Cincinnati. (See figs. 34 and 35.) The Zimmerman evaporator is an "up-right" apparatus made almost entirely of galvanised iron. Its general form will be seen on reference to figs. 34 and 35 in the papers you have in your hands. It is made in several sizes, which are known as No. 1, No. 2, &c. No. 1 (fig. 34) is the smallest size, and costs at the works £5. 5s. It is intended

especially for family use, and is so constructed as to be usable as a fruit-evaporator, or, by a simple contrivance, as a baking-oven. It is large enough to dry from three to five bushels of apples per day, or to bake eight to ten loaves of bread at a time. It is 4 feet high, 26 inches wide, and 2 feet from back to front. It is supplied with six galvanised wire trays, on which the fruit is evaporated, the drying surface being rather more than 20 square feet. In appearance this dryer is much like an ordinary stove. At the bottom is the furnace in which coal or wood can be used as fuel. The smoke is carried off by a pipe at the back of the dryer. Above the furnace is the evaporating-chamber, and the admission of air is regulated by dampers. The air is heated by contact with the furnace, then passes among the fruit, &c., and out through a covered chimney at the top of the chamber; thus there is a continuous upward current, which in the larger dryers is increased by so connecting the smoke-pipe with the ventilating-pipe that the ascending current from the furnace helps the upward draught. The drying-trays rest upon ledges fixed on the sides of the drying or hot-air chamber.

The dryer No. 2, which is double the capacity of No. 1, and $5\frac{1}{2}$ feet high, is both dryer and baker. Its cost is £10. 10s. This is the size most generally sold for private use. It will dry from five to seven bushels of apples per day. No. 3 (fig. 35) is a larger apparatus, stands 6 feet high, 38 inches wide, 37 inches deep, has twenty-four wire trays, 15 inches by 24 inches, supplying 85 square feet of drying surface. The drying space is divided into two chambers, the smoke-pipe being carried up between them. It will dry about double the quantity of fruit that No. 2 will dry. Its price is £21. This is the size in most general use for drying fruit for market on a moderate scale. The larger sizes, Nos. 4 and 5, are called "factory dryers," or evaporators. No. 4 will dry from twenty to thirty bushels of apples per day, and costs £35. No. 5 will dry from thirty-five to fifty bushels per day, and costs £52. It is the same size as No. 4, but differs from it in being fitted with a mechanical contrivance called an elevator, by means of which the racks or drying-trays are gradually lifted from the bottom to the top of the drying-chamber, whereas in all the other sizes the trays are stationary. The arrangement for the admission of hot air in No. 5 is somewhat different from that in the other sizes, and the makers state

that "it is the fastest, and for its capacity the most economical, evaporator offered for sale."

The other form of evaporator I shall describe differs from the Zimmerman and others of the same general pattern in the arrangement of its hot-air chamber, which is not placed vertically above the stove, as is the case in those already described, but at a small angle in an inclined position, away from the stove or furnace. This, which is known as the "American" evaporator, is made at Waynesboro', Franklin County, Pennsylvania, by the American Manufacturing Company; also by Messrs. Ph. Mayfarth & Co. at Frankfort-on-the-Main, who have an agent in England, Mr. A. Ludwig, 16 Mincing Lane, London. A sketch of this evaporator is given in fig. 36. These are the terms in which the American Manufacturing Company describe the merits of their evaporator:—"By a process contrary in effect to that so long practised *faut de mieux* by the old-school dryers, we, by the direct action of heat in the primary stages, fix the essential oils to which aroma and flavour are due. At the same time, by the action of the automatically diffused currents of hot dry air, is developed an artificial cuticle or parchment-like skin, and thus hermetically sealing the cellular formation containing the volatile essential oil, on the perfect retention of which so much depends. . . . By our method we likewise prevent any retrograde effects, for the operation is continuous to the finish, which takes effect at a reduced graduated point of temperature, and, while the automatic discharge, seriatim, of waste vapouric elements is effectually provided for, we likewise insure a succession of currents of fresh dry hot air, which automatically pass underneath, diagonally through, and then off over" the trays inside the "inclined pneumatic flue." It is claimed that the action of the evaporator is so rapid that the exposure of green fruit for ten minutes only in the hot-air chamber is sufficient to perfectly dry it on the outside. The currents of hot air passing through this evaporator when in full work are said to be "self-created and continuous, strike the trays at a uniform upward angle with considerable velocity, quickly absorb all moisture, then pass off out of the evaporator." The "American" is made in a number of sizes. The smallest, No. 0, is made for family use or limited operations only; price at the works, £7. 10s. No. 1 has a surface drying capacity of 35 square feet, and the price is

£16. No. 2 (fig. 36) is of rather more than double the capacity of No. 1; price £21. The evaporators of a larger size are called "commercial sizes." Of these No. 3 has a drying capacity of 300 square feet, and is capable of drying from forty to fifty bushels of apples daily; the price is £52. Nos. 4 and 5 are much larger in size, as may be judged from the prices, which are respectively £104 and £135. No. 5 is equal to drying 150 bushels of apples every twenty-four hours. All through this paper a day may be taken to mean twenty-four hours, as it seems clear to me that the usual plan is that when an evaporator is set at work in the States it is kept going night and day. Except the furnace fittings, the "American" evaporators are chiefly made of wood, which the makers claim to be the best substance for the purpose, and it is stated that the insurance record shows that they are quite safe from injury by fire under ordinary circumstances.

The prices quoted by Messrs. Ph. Mayfarth & Co. for the various sizes of the "American" evaporator are somewhat less than those given above: thus No. 1 is quoted at £13 instead of £16. This evaporator has been exhibited at several agricultural shows in this country; and one has been at work at Well Place Farm, Penshurst, Kent, for some time; also at the "Invicta" Works, Maidstone; and satisfactory reports of the work done have appeared in the local papers. This evaporator was exhibited at the Royal Agricultural Society's Nottingham Show in 1888; and at the Windsor Jubilee Show in 1889, where it was awarded the Society's prize, value £30. The size which won this prize was the No. 2 evaporator (the fig. 36 in my sketch). In vol. 1. pp. 494-6 of the *Royal Agricultural Society's Journal* (1889) there is a most favourable report on the trial made at Windsor, where the judges appear to have been quite satisfied with the performance of the "American" evaporator.

The *Journal of the Royal Agricultural Society* for October 1888 (pp. 490, 491) contains a paper in which there are some interesting particulars about fruit evaporation, and as the author is Mr. D. Pidgeon, a civil engineer, officially connected with the Royal Agricultural Society, I feel I may commend what he says on the subject to everyone interested. He contributed another paper on the same subject in the first part of the third series of

the Society's *Journal*, published March 1890. From these two papers and other sources I have collected the following particulars. First, I will give an extract from Mr. Pidgeon's first paper. He says:—

A bushel of green apples, weighing about 50 lbs., can be dried at a cost of from 6*d.* to 7½*d.* The total cost of the dried product is from 8*d.* to 5*d.* per lb., and the average selling price from 3½*d.* to 6*d.* per lb. One bushel of green apples produces about 6 lbs. of dried apples. One pound of coal is consumed in evaporating enough green fruit to yield 1 lb. of dried fruit. Before drying the apples are pared and cored by one of the many ingenious contrivances in use for that purpose. The cores and parings are dried and sold for jelly-making, realising about £4 per ton. A bushel of apples yields 80 lbs. of "meat" and 20 lbs. of refuse (cores, &c.). The 80 lbs. of "meat" is reduced to 6 lbs. by evaporation, and the 20 lbs. of refuse to 4 lbs.

The Zimmerman Machine Company give the following particulars: A bushel of green apples weighs about 50 lbs., is worth from 7½*d.* to 10*d.*, and will produce 6½ lbs. of evaporated fruit. It will cost 5*d.* to do the work, and the market value of the evaporated fruit will be from 5*d.* to 7½*d.* per lb. Assuming these figures to be correct, then the 6½ lbs. of evaporated fruit at *lowest* price (5*d.* per lb.) will realise 2*s.* 8½*d.*

Deduct: Value of fruit at *highest* price 10*d.*

Cost of evaporating 5*d.*

————— 1*s.* 3*d.*

Leaving a *gross* profit of 1*s.* 5½*d.*

or about 2¾*d.* per lb., from which carriage and salesman's commission will have to be deducted. The *net* profit will be over and above the value of the apples as gathered from the trees. It will be noticed that in making this calculation I have put the price of the apples at the *highest* quoted amount, and the selling price of the evaporated fruit at the *lowest*.

The same company give the following figures to show the result of one month's run, working day and night, of a No. 3 evaporator:—

	£	s.	d.	£	s.	d.
<i>Produce</i> : 2,700 lbs. evaporated apples at 7½ <i>d.</i> *				84	7	6
<i>Cost</i> : 450 bushels apples at 10 <i>d.</i>			18 15 0			
Fuel 30 days at 1 <i>s.</i> 0½ <i>d.</i> per day			1 11 3			
Labour 30 days			8 6 8			
			—————	28	12	11
Gross profit			£55 14 7			

* This is no doubt the *outside* selling price.

which is equal to rather more than $4\frac{3}{4}d.$ profit per lb. of evaporated fruit. I have some fear that this is an over-statement, but it is only fair to say I find similar estimates given by other firms. If Mr. Pidgeon's figures and these are added together, and an average struck, it is probable it will give a not inaccurate idea of the profit frequently made. But it must be borne in mind that the amount, whatever it is, is so much *real gain* over and above the market value of the fresh fruit, which has been deducted from the total cost before the profit is ascertained.

In America the total value of evaporated fruit produced and sold annually must amount to a very large sum of money, but I have been unable to get any reliable estimate as to how much it is. Mr. Pidgeon (*Royal Agricultural Society's Journal* for March 1890) furnishes the following figures for California alone:—Total weight of all kinds of fruit evaporated in that State during 1888, 31,450,000 lbs., the value of same being £431,590.

The western portion of New York State, in a district lying within a radius of forty miles around the city of Rochester, produced in 1888 37,750,000 lbs. of evaporated fruit (all but 750,000 lbs. of which were apples) of the value of £297,000. Mr. Pidgeon states that to produce this amount 250,000,000 lbs. (111,000 tons) of green apples and 250,000 quarts of fresh raspberries were operated upon; 19,000 tons of coal were burnt in 1,500 drying-houses (each containing one or more evaporators of various sizes), and 45,000 hands were employed during the four months of the year, bringing about the result quoted above.

The conditions are not in several respects the same in America and England. The quantity of fruit which can ever be available for evaporating is much smaller in this country; but I cannot see any reason for thinking that there would not be always plenty of work to employ a good number of evaporators here in prolific seasons. The best fruit would of course realise the most money if marketed as fresh fruit, provided it was unmixed with inferior fruit, and as much care bestowed upon grading it and sending it to market in the best possible condition as is the invariable rule in America. The second-rate fruit is, however, sufficiently good to produce the best quality of

evaporated fruit; and I feel sure that the price this would produce, after passing through an evaporator, would yield a much larger profit than would be obtained under any ordinary circumstances for the same fruit if marketed in the green state. And then it must be borne in mind that the evaporator could be used for drying vegetables, of which a large quantity are so treated, and find a ready sale in America. This use of the evaporator was tested at the Windsor show, and the result was deemed quite satisfactory.

The much smaller production of apples, &c., in this country as compared with America suggests the idea that it will not be advisable for every English fruit-grower to set up an evaporator, but that a better plan would be for one man to do all the evaporating for his immediate neighbourhood, either buying the fruit outright or evaporating it for his neighbours at a reasonable rate.

I think what I have said tends to show that the evaporator is an appliance which ought to come into use in this country, or, at all events, that it deserves a fair and full trial; and I hope some enterprising landowner, in a fruit-growing district, may be induced to buy one of these appliances and have its usefulness tested for the benefit and instruction of his tenants and neighbours, as well as his countrymen generally.

It is right to add, in conclusion, that I have purposely avoided recommending any one evaporator as the best. I should also like to state that I have no pecuniary interest in any of them, and do not personally know either of the many manufacturers.

DISCUSSION.

Mr. CHEAL said he had long thought something in the way of the fruit-evaporator was much needed in this country, because in years when there was a good crop of fruit the markets were glutted, and the cost of production could not be realised; consequently much fruit was sold at very low prices, and some of it was even spoiled and lost. But this loss would be prevented if fruit-evaporators were adopted, and there was no doubt they would be a great boon both to the producers and consumers. Therefore some means should be found to preserve fruit, instead of allowing it to spoil, but it should be preserved *without* sugar, as it would then be rendered more valuable for domestic purposes.

Some years ago experiments in fruit-preserving were made by the Royal Horticultural Society not only by heat but also by exhaustion, but Mr. Cheal said he did not think they were altogether a success. Fruit dried by means of heat would, in his opinion, be most valuable.

Mr. D. MORRIS, Treasurer R.H.S., said he had seen fruit-evaporators at work in America. Apples were chiefly experimented on, though at times other fruits also, and many farmers used to dry all sorts of fruits, &c., by their means. The machines were simple things, notwithstanding their complicated appearance. In 1882-3 he saw them at work, which is performed as follows: The apple, or whatever it may be, is pushed into a tube which takes out the core; afterwards a chisel-like tool takes off the peel, and at the same time a sharp instrument goes into the apple and cuts it into a long spiral string, or sometimes it is cut into rings. The fruit is then put in trays, which are placed in position in the drying-machine. One objection in regard to the drying-machines was that the steam rising from the lower trays of fruit has a tendency as it rises upwards through the upper layers to cook the fruit on the upper trays. This disadvantage has now been remedied by means of the "Zimmerman" evaporator, which has a flue specially constructed to carry off the generated steam. There could be no doubt as to the utility, simplicity, and economy of these evaporators, and he thought that, where a person had a surplus quantity of second-class fruit, it would be much better to preserve it by means of these machines than to have it wasted. In the tropics the banana must be cut before it is ripe, so that it may reach this country in proper condition for consumption; but very often they are spoiled from one cause and another and hardly fit to eat. If, however, they were dried by these machines they would then reach this country in a much better condition. But, somehow, bananas were little cared for in England, and this was no doubt because it was inferior to British fruit, which was by far the best, and perhaps this fact accounted for fruit-evaporators not being generally used here; but still he would recommend anyone that could do so to use these evaporators wherever possible.

A gentleman asked if these machines could be applied in the case of potatoes, and also if there was any commercial value to be attached to fruits preserved by means of these evaporators.

Mr. Morris replied that, as far as commercial value was concerned, the apples prepared by these machines were much used in America, and formed the ingredients of puddings and pies. Fruit so prepared was very palatable, and even retained some of the fresh juices, and, besides, it could be kept for almost any length of time.

THE HOLLYHOCK (ALTHÆA ROSEA).

By Mr. JAMES DOUGLAS, F.R.H.S.

[Read August 25, 1890.]

THIS is a very old inhabitant of our gardens. It was cultivated in its single and double forms nearly three hundred years ago. When Gerard published his "History of Plants" he gave woodcuts of single and double varieties. At that time single red, white, and purple varieties were grown. Gerard figures at page 783 a double purple and a double scarlet. This was in 1597. About a quarter of a century later, when "The Paradisus" was published by Parkinson, many more double Hollyhocks had been raised. He says: "The flowers are of divers colours, both single and double, as pure white, and pale blush, almost like a white; and more blush, fresh and lively, of a rose colour; scarlet, and a deeper red like a crimson; and of a dark red, like black blood." And he further states that they will reasonably abide the winter. The Hollyhock has been treated upon by all the leading authors on gardening subjects from the time of Gerard until now. It is altogether a noble garden plant, and when well placed is an ornament in any garden, be it that of the humble roadside cottage or that of prince or peer. It would be tedious, nor would it be desirable, to continue the history of our plant during its progress to the high state of perfection it has now attained; but I may be allowed to record as much of its modern history as falls within my own recollection during a period of some thirty-five years. About that time two types of Hollyhock were in cultivation, usually termed the English and Scotch varieties. The first named were, if I may say so, of the more refined character. The flowers were, in comparison to those grown now, of small size, closely set on the spikes; they had

also neat, well-filled centres and narrow guard-petals. The Scotch varieties had immense flowers, with wide guard-petals and smaller centres, indented with openings, termed "pockets" by gardeners. It occurred to Mr. John Laing, who was at that time a famous gardener in Scotland, to hybridise the English and Scotch types with each other, hoping thereby to obtain a new strain with a smaller width of outer petal than the Scotch type, and a greater width than the small English flowers. In this Mr. Laing was eminently successful. Other growers at that time, or earlier even, made great improvements in our plant; amongst them it is only right to mention Mr. Charles Baron, a working shoemaker, of Walden, who, by concentrating his energies on one flower, was able to improve it very much indeed, as the record of beautiful varieties raised by him will testify. It is very gratifying to me not only to record the result of the labours of the Walden shoemaker, but also to acknowledge our indebtedness to the labouring class for the many beautiful florists' flowers that adorn our gardens; to such men as the hand-loom weavers of Lancashire, the working cutlers of Sheffield, and the factory operatives of Newcastle, for producing Auriculas, Pinks, Carnations, Picotees, Tulips, and Polyanthus. Other raisers in England at the time I have mentioned were Messrs. Paul & Sons, of Cheshunt; Mr. Chater, of Saffron Walden, &c.

Propagation.—The Hollyhock is propagated by seeds, cuttings, and root-grafting. Seedling raising is the easiest and most natural way, and if seeds are obtained in a haphazard way, from the best named varieties at present in cultivation, at least 50 per cent. of the progeny will be as good as the parents—a few may even surpass them. This method of culture does not require the use of glass lights or glass protectors of any kind. The seeds may be sown in the open border early in May; and when the plants have grown so that they may be easily handled, they may be pricked out about 6 inches apart on a bed of fine soil, to be planted where they are to flower about the middle of September. The plants should be 3 feet apart in the rows, and 4 feet between the rows.

Cuttings are taken in the summer and autumn by cutting out the leaf-buds from the lateral growths, much in the same way as the eyes of vines are taken for propagation. Plant each eye singly in a small pot of sandy soil. At the same time many

cuttings may be found in the form of leafy growths quite at the base of the main stem ; a portion of these may be cut off with a sharp knife quite close to the stem and planted singly in small flower-pots, in the same manner that the eyes have been. They will also produce roots in a close frame, but must be shaded from bright sunshine, a little ventilation being necessary at the highest part of the frame. These, when rooted, may be planted in larger flower-pots, and wintered in cold frames ; for we must not ignore the useful hint given by Parkinson, that they will reasonably abide the winter. I am sure no good gardener would trust his entire stock of any good variety out in the borders during the winter months, even in the south of England. This remark on hardiness does not apply to seedling plants that have not flowered, for if these are well established in the open ground before the winter the losses are so few that they need not be taken into account.

General Cultural Remarks.—In the preparation of the soil for any plant we must consider the nature of the subject with which we have to deal. The Hollyhock is a gross-feeding plant, and requires very rich deep soil to grow in, so that the ground should be trenched 2 feet deep, and plenty of farmyard manure should be incorporated with it in the process. The time of planting is in spring, when the really severe frosts are over, but the preparation of the ground should take place in the early autumnal months of the previous year : this is necessary if the very best results are expected. Even stiff clay soils are pulverised into fine powder by the winter frosts, and if the surface is lightly forked over in fine weather (for it must not be touched in a wet state) it will be in the best possible condition for planting about the end of March or early in April. Hollyhock plants will grow from 6 to 12 feet in height, or even more ; therefore they require stout sticks about 6 feet out of the ground. To save labour and future injury to the roots of the plants it is best to put in the permanent supports at once. A stake of some kind is necessary, and it does not take much longer to place a large one than it does a small one which must be removed later. When well established not much culture is needed, except to tie the stems to their supports ; and if the best results are expected, the leaves must be copiously syringed and the plants freely watered in hot dry weather. A mulching of decayed manure ought to be spread over the surface of the ground at the base of the stems of each plant.

The flowers must be removed as soon as they show signs of decay, for two reasons—first, because if seeds are expected the decaying mouldy petals will cause the seed-pods to rot; and in the second place, decaying flowers detract very considerably from the beauty of the fully developed sound ones higher up on the spikes.

When the flowering and seeding periods are over cut the stems down to a height of 6 inches from the ground. Soon after this the plants may be dug up and either planted out closely together in a frame or planted in flower-pots, and these may be plunged to the rim in some dry material, such as dry cocoa-nut fibre refuse. In the spring all the shoots or growths except one may be taken off to form cuttings or root-grafts, and they will produce roots freely in a hot-bed or propagating-house as early in the year as January and February.

Diseases and Insect Pests.—Red-spider is the most troublesome of all the insects injurious to the Hollyhock. It spreads over the leaves very rapidly, if unheeded, in hot weather; but it is detected in its earliest stages by the experienced cultivator, who speedily orders the application of water by a good syringe to the under sides of the leaves, and the mere mechanical force of the water, if applied daily, dislodges the pest; and the water which trickles down the main stem to the roots is beneficial to the plants, as it is only in hot dry weather that the spider is troublesome. The spittle-fly does a little mischief in the early stages of the plant's growth, but they are seldom so numerous as to be a pest to the cultivator, and they are easily destroyed.

A much more formidable parasite is the Hollyhock fungus, *Puccinia malvacearum* (figs. 37 and 38*); it is very insidious in its attacks, appearing when it is least expected, and holding on until the plants are reduced to unsightly objects, with the withered leaves rustling in the wind—a melancholy spectacle. I have tried to destroy it by picking off the affected leaves and well washing the apparently sound ones in soft-soapy water in which had been mixed a large portion of flowers-of-sulphur. This repeated several times has had the effect of warding it off until quite the end of the season, when not much mischief has been done. Mr.

* For the use of the illustrations (figs. 37 and 38) of the fungus which affects the Hollyhock as well as other Malvaceous plants we are indebted to the Editor of the *Gardeners' Chronicle*.

Harry Renton Mein, of Messrs. Stuart & Mein, Kelso, informs me that he has quite destroyed the parasite on the leaves by washing them with Condy's fluid. I tried the plan of leaving the plants just where they flowered in the open garden for the winters of 1887 and 1888, and no trace of fungus appeared during the



FIG. 37.—PUCCINIA MALVACEARUM--HIGHLY MAGNIFIED.

growing and flowering seasons of 1888-9; but we lost many plants during the winters. In the autumn of 1889 I had all the plants lifted and planted in flower-pots, and we propagated plants from cuttings last February. They were placed in a forcing-house to form roots, and, to my extreme vexation, the disease

appeared ; and although we tried to get rid of it when the plants were small, it resisted our efforts, and has done much damage to



FIG. 38.—LEAF ATTACKED WITH PUCCINIA MALVACEARUM.

some of the plants, although the general collection has not failed to flower remarkably well.

HARDY GLADIOLUS.

By M. EMILE LEMOINE, of Nancy.

[Read Sept. 9, 1890.]

BEFORE I enter upon the subject which is to occupy us to-day, viz., the study of the Gladiolus, as it has been transformed by numberless hybridisations and improved by successive selections, I am anxious to tender my most grateful thanks to the Council of the Royal Horticultural Society for the honour done to French horticulture in inviting one of its members to utter his ideas before so celebrated a Society. Although I fear that such a task may be too hard for me, I shall endeavour to fulfil it as well as I can, treating the question from a general point of view and avoiding constant enumerations as well as tiresome particulars. After having examined as summarily as possible the first hybridisations that amateurs and growers have been

trying since the first species of Gladioli were introduced, and mentioned first the various sections of early-flowering Gladioli (a specialty of some Dutch firms and of the nurserymen of the Channel Isles), and then the extensive series of Gandavensis hybrids, I shall examine more thoroughly the new races of hardy hybrid Gladioli, where I shall distinguish two classes, which are now quite distinct, and have been termed—one, Lemoine's spotted *Gladiolus*, and the other, *Gladiolus nanceianus*. I shall explain how both sections were obtained and improved, and, treating their cultivation and their uses, I shall show how easy it is to succeed with them in every soil and exposure, even in places where the growing of other Gladioli may present some difficulty.

I do not intend to give here a classification of the different botanical species, either introduced and cultivated, or only represented in herbaria as dried specimens. Such a work is the business of men of science, and, moreover, it would be beyond the subject of this lecture. Suffice it to state that the genus *Gladiolus*, one of the finest and most popular of the Iridaceous family, numbers about ninety species, all belonging to the flora of the Old World. Though the greater part of them, and the most beautiful, are natives of South Africa, some are to be found in South Europe: one, for instance, *G. illyricus*, grows naturally as far northward as England; some others exist in Persia and Afghanistan, in the oriental regions of Africa, and in the island of Madagascar.

Gladiolus communis, a native of Mediterranean Europe, is often met with in private gardens along with the *Gladiolus* of Constantinople (*G. byzantinus*), both introduced into Western Europe about two centuries ago. They are perfectly hardy, and their cultivation requires no special care. From the middle of last century travellers began to introduce from the Cape of Good Hope a great many species, among which may be mentioned *G. angustus*, *brevifolius*, *blandus*, *campanulatus*, *cruentus*, *Cunonia*,* *cuspidatus*, *dracocephalus*, *edulis*, *elatus*, *gracilis*, *hastatus*, *hirsutus*, *involutus*, *namaquensis*, *Milleri*, *quadrangularis*,* *recurvus*, *sulphureus*, *trichonemifolius*, *trimaculatus*, *tristis*, *undulatus*, *versicolor*, *viperatus*, *Watsonius*, &c. Nearly all these species offered to amateurs have but a merely scientific interest; therefore it is no wonder if the greater part of them

* *G. Cunonia* and *G. quadrangularis* belong to the genus *Antholyza*.—ED.

have found their way only into botanical collections, and have disappeared from gardens.

Towards the end of the last century were introduced from the Cape *G. cardinalis* and *G. floribundus*, and about the year 1824 *G. psittacinus* (or *natalensis*), three very interesting species, which, intercrossed some years later, produced the beautiful hybrids known as *gandavensis*. From that date were introduced some other new species, among which may be pointed out *G. papilio*, *atroviolaceus*,* and especially *purpureo-auratus* and *Saundersii*, from which the new hardy spotted varieties have been raised.

As nearly all the above species are very easy to grow, and many of them quite hardy, a great number of amateurs undertook their cultivation. Growers did not confine themselves to increasing them by planting the bulblets, which are produced in great quantity at the base of the corms; they endeavoured to save seeds, and, seeing how easily self-fertilisation takes place in the Gladioli, many experimented in the way of artificial hybridisation and crossing. Among those who obtained the finest results was Dean Herbert, who raised a great many hybrids in his garden at Spoforth, more than seventy years ago; many of these hybrids were hardy, and maintained themselves for a long time. They proceeded from crossings between *G. cardinalis*, *blandus*, *carneus*, *inflatus*, *angustus*, *tristis*, &c., and showed a great variety of shades. The greater part of these hybrids are now probably lost.

But the amateurs' endeavours were not limited to the above trials. Their attention was also drawn to the whole series of early-flowering species, yielding flowers during the first months of summer under a special treatment. They grew for this purpose such kinds as *G. cardinalis*, *communis*, *floribundus*, *ramosus*, *trimaculatus*, &c., and soon began to intercross them with one another. Hence issued a great many intermediate forms, the majority of which showed features of consanguinity with *G. ramosus*, as was suggested by the existence of a long, lenticular purplish blotch, with a white spot in its centre, which imparted to the whole spike a very pleasing appearance. A rather large number of these offspring are still grown for cut flowers, especially *Ardens* or *Fire King*, *Formosissimus*, *Prince Albert*, *Prince of Wales*, *Queen Victoria*, *Sarnian Gem*, *Ville*

* A native of South-western Asia.—ED.

de Versailles, Colvillei, and its variety Colvillei albus or The Bride, a highly esteemed and world-wide grown plant. As previously stated, they are cultivated in the Netherlands and in the Channel Isles. They are planted from October to December in pits, where they are sheltered from frost, and they open their flowers from June to July.

Thus far, in spite of the variety of its shapes and colours, the *Gladiolus* was little more than a plant for amateurs. The appearance of the Ghent *Gladiolus* (*gandavensis*) produced quite a sensation in the horticultural world, and caused the rapid diffusion of a kind which became in a short time very popular.

In the course of the summer of 1837 the gardener to the Duke of Aremberg, at Enghien, named Beddinghaus, thought of hybridising *G. psittacinus* with *G. cardinalis*.* It is possible that some other species, grown along with the two named ones, had been used at the same time as polleniferous plants. However, the appearance of the offspring revealed its origin. This *Gladiolus* showed the habit and inflorescence of *G. psittacinus* but with larger individual blooms, and the colour of *G. cardinalis* but more diversified, red with pink shades, and yellowish spots on the lower segments of the flowers.

As soon as Louis van Houtte, the celebrated Ghent horticulturist, heard of Beddinghaus's success, he purchased the novelty and gave it the name of *Gladiolus gandavensis*.

"I have just acquired the exclusive property of this *Gladiolus*," said he in his Catalogue for 1841, "excepting two bulbs which are in the possession of another Belgian nurseryman. Everyone is coming to see it whilst I am writing these lines. For its habit and colour it leaves far behind everything known among *Gladioli*. Its size surpasses that of *G. ramosus*; its majestic corollas, seventeen to twenty in number, are of the brightest vermilion, their lower petals, adorned with chrome-yellow, amaranth-red, and pistachia, are, besides, beautified through the sky-blue anthers which decorate the centre of the flower."

When the reader of this pompous description has before his eyes the coloured plate which Van Houtte published in his "Flore des Serres et des Jardins de l'Europe" for 1846, he may find some difficulty to understand how such a flower could suggest such enthusiastic ideas. In fact, since 1841, nurserymen have

* On the origin of *G. gandavensis*, see note, p. 574.

worked diligently, and the gorgeous things we are now accustomed to see exhibited by the lucky raisers of Gladioli cause us to lose sight of the first origin whence they have arisen.

Indeed, a short time after *G. gandavensis* had been distributed in gardens, it was reported that Mr. Cole, gardener to J. Willmore, Esq., of Oxford, had crossed this variety with a pink-flowered species, *G. floribundus*, and had raised three seedling plants, one of which, named *G. Willmoreanus*, had white flowers with pink stripes, and was described and figured in 1850 in the *Gardeners' Magazine of Botany*. Nearly at the same date M. Souchet, of Fontainebleau, was undertaking similar trials. During the summer of 1852 were to be seen in his gardens some beds of seedling Gladioli in full bloom. They were raised from an artificial cross, viz. *G. gandavensis* fertilised with the pollen of *G. blandus* and *ramosus*. This experiment had perfectly succeeded, every intermediate shade of colour between white with lemon tinges and the darkest purple-crimson having been obtained; many plants showed large and well-expanded corollas, and the influence of *G. blandus* and *ramosus* had imparted to the offspring a much hardier constitution than was known in the first *Gandavensis*. "M. Souchet's beautiful plants," it was stated in the *Bulletin* of the Central Horticultural Society of France for 1853, "are as great an advance on *G. gandavensis* as it was itself an improvement on *G. psittacinus*, its mother."

M. Souchet was not the only French grower who was interested in hybridising the new Gladioli. At the same time M. Truffaut, of Versailles, M. Verdier père, of Ivry, near Paris, and M. Courant, of Poissy, were renowned for the results they obtained.

As a matter of fact, all these so praised plants now seem to us to be poor acquisitions in comparison with the beautiful new hybrids which we are admiring every year; but I thought it was necessary to do justice here to those who first created the garden Gladioli, and marked out for their successors a way so easy to follow.

Another voice will have more authority than mine in pointing out the improvements which skilful growers have little by little made in this group, and the latest results which both English and French specialists have in store for the numerous lovers of this beautiful sort. I will not dwell any more upon it, but will

examine the new class of *purpureo-auratus* hybrids which have been termed Hardy Spotted Gladioli.

Gladiolus purpureo-auratus (J. D. Hooker) was introduced from Natal into England by Mr. William Bull about 1870, and was described for the first time in the *Botanical Magazine*, January 1872, No. 5,944, and afterwards in Van Houtte's "Flore" of February 15, 1874. This well-known nurseryman, in whose grounds the new species was already grown, speaks thus: "Let this native of Natal be welcome, for its shape and especially its colour are unusual, and will allow us to obtain from it some interesting hybrids."

As this plant, though very easy to grow, is somewhat rare in gardens, and seldom met with at horticultural exhibitions, it will be as well to describe it shortly. Its rather broad and firm leaves, of a glaucous green, are not often more than 18 inches high. The flower-stalk, about 3 feet, is first upright, and then arched on a level with the lower flowers; the latter (there are never more than three open together) are small, funnel-shaped, and kneed at their base, so that normally, and without a stake, they are quite bent towards the ground. The colour is a pale sulphur yellow, more apparent on the lower segments, which are marked with a long, purplish spot. There are about fifteen blooms, opening successively on the principal stem, which are followed by one or two secondary spikes laterally inserted on the first. The corn is very small, about one inch across, and puts forth, after the plant has done flowering, some bulblets, frequently as big as itself and borne on long peduncles, which are horizontally developed, and extend two or three inches from the bulb. *G. purpureo-auratus* is perfectly hardy, and if one of its bulbs is left in the ground, the second or third year there will be a large clump of leaves and flowers—thanks to its peculiar power of emitting bulblets to a distance.

Such is the species which was destined to become the mother of a new race of hardy Gladioli.

Having noticed the perfect hardiness of this plant, the bulbs and bulblets of which, when left in open ground, would invariably spring up every year, M. Victor Lemoine, of Nancy, determined to try if a hybridisation between it and the *Gandavensis* varieties would not give greater vigour to the latter. Having purchased some of the best varieties of *Gandavensis* in the course of the

year 1875, he impregnated *G. purpureo-auratus* with their pollen. Some seeds were saved and sown, and produced, after two years, three flowering plants. One received the name of *Gladiolus Lemoinei*; the second was called Marie Lemoine; and the third, which bloomed somewhat later, was discarded as having a dull shade of colour. The two named plants were grown for some years in our trial grounds before they were sent out. It was quite obvious that, like their female parent, *G. purpureo-auratus*, they were hardy, and could, without any danger, remain in the open ground during the winter. Both having the same habit and hardiness and height of spike, and possessing equally large and well-expanded flowers, with purple blotches and yellow tips on the lower segments, they differ from each other in the fundamental colour of the corolla, which is a pale salmon-pink in *Lemoinei* and straw-white in Marie Lemoine. At the Paris Universal Exhibition in July 1878 the new *G. Lemoinei* attracted the attention of many amateurs, who foretold for it a great and successful future. It was exhibited a year later at the Royal Horticultural, thanks to the kindness of Messrs. J. Veitch & Sons, who gave themselves the trouble to grow it, and it was awarded a first-class certificate.

The *Garden* of August 16, 1879, speaks thus in its report:—

“This fine hybrid *Gladiolus*, raised by M. Lemoine, of Nancy, is the result of a cross between *G. purpureo-auratus*, a true species, and a native of Natal, and *G. gandavensis*, which is itself a hybrid, and one of those from which the many varieties grown in gardens have emanated, having been raised some years ago between *G. psittacinus* and *G. cardinalis*. Lemoine’s *Gladiolus*, which grows from 2 feet to 3 feet high, partakes in a striking degree of the characters of both parents, but it is said to have the more perennial character of *G. purpureo-auratus*. It is of robust growth, with plaited foliage of a rich green colour. Its flowers, which are about the size of ordinary garden *Gladioli*, are arranged closely on the spike, which is about one foot long. The three upper segments, which are broad, are of a creamy-white colour suffused with pink, and the lowermost one has a thick streak of rich, deep, purplish crimson down the centre; the other two are wholly that colour except about half an inch at the tip, which is a bright yellow. It is now in flower in the open border at Messrs. Veitch & Sons’ nursery, at Chelsea, whence it was exhibited at the Royal Horticultural Society on Tuesday last, and was deservedly awarded a first-class certificate.”

The two new *Gladioli* were sent out in January 1880. Not long afterwards M. Froebel, nurseryman at Zurich, offered under the name of *Gladiolus Froebeli* a plant which resulted from the

same cross and bore a great resemblance to G. Marie Lemoine. It would not appear that M. Froebel continued his experiments in this direction, and with the exception of one or two other sorts which are found in his later catalogues, he seems to have relinquished his attempts to improve the *purpureo-auratus* hybrids. I shall only mention the florists who have raised seedlings from Lemoine's Gladioli by crossing them with some sorts of Gandavensis, and have obtained good varieties. Such are MM. Deleuil, of Marseilles; Tréfoux, of Auxerre; Torcy-Vannier, of Melun; Souillard et Brunelet, of Fontainebleau; Haage & Schmidt, of Erfurt; and Krelage, of Haarlem. As the varieties which they sent out, and are now still sending out, were originated long after ours, I only name them in justice to their endeavours.

In reality we had taken a long stride in the way of obtaining a new race of hardy Gladioli, and we had to go on. We were in possession of but two varieties a little different from each other, with elegant shades and blotches, but far behind the striking colours peculiar to Gandavensis. Our object was plain and evident: to impart to the new race the variety and brightness of colour that were wanted; to give them strong and upright spikes; to increase the number and the size of the blooms; in short, to infuse into them as many as possible of the good qualities of Gandavensis which they did not yet possess, without depriving them of their own vigour and hardiness, which they had just acquired, and which, in our opinion, was so great a merit.

There was nothing else to do than to fertilise the new hybrids with the finest Gandavensis sorts, and to discard mercilessly, and in spite of their beauty, all the offspring that did not seem to stand sufficiently against the winter frosts; and our experience soon proved that the more the seedlings resembled G. Lemoinei in shape, colour, and strong markings, and even in the smallness of their bulbs, the more they retained their hardiness; while those in which the characteristics of Gandavensis predominated would not thrive well in our stiff soil, and gave no satisfaction.

In the beginning of 1882 a set of five varieties (among which was that named Lafayette), all raised and obtained by the above means, was offered for sale, and met with favour at the hands of amateurs. In the course of the same year these varieties, along

with some unnamed ones, which were to be offered in the following autumn, were staged before the National Horticultural Society of France, and were awarded a first-class premium. From that date a large number of seedlings have been raised and preserved, and though a large proportion of them after being grown for one or two seasons have been cast away without being sent out, the remainder, considered as good varieties, have been successively offered to the trade at the rate of about ten novelties every autumn. To enumerate them would be superfluous.

Amateurs in every country soon recognised what an acquisition they had gained in these Hybrid Gladioli, and many spoke most favourably of them, and I seize this opportunity to return publicly my thanks to Mr. W. E. Gumbleton, of Queenstown, who made it his business to try, and to study accurately, each of our novelties as soon as sent out, and to publish every year an impartial and sincere account, with the descriptions of the varieties, accompanied now and again with severe remarks on some, and many a lover of plants thus received very valuable information, and was able to benefit by Mr. Gumbleton's well-known experience.

There are now actually in cultivation about sixty varieties of Lemoine's Gladioli, among which I only think it necessary to mention the most distinct and striking ones, those which ought to find a place in every collection:—

White.—Mme. Lemoinier (1886), cream, with a long plum-coloured blotch; Venus de Milo (1888), white, with a blush shade and a feathered spot on the lower segments, large flowers.

Salmon and Rose.—André Chénier (1884), pink, with a large brown spot and yellow tips; La France (1884), salmon rose, with long violet blotches; Boussingault (1887), an improvement on André Chénier.

Cream and Straw-coloured.—Lafayette (1882), cream, spotted with maroon; Etoile (1885), salmon yellow, with blood-red markings; E. V. Hallock (1887), large straw-coloured blooms, with brown spots; Amiral Krantz (1887), a beautiful improvement on Lafayette.

Yellow.—Alsace (1884), pale sulphur yellow, a little spotted; Sceptre d'Or (1885), bright yellow, heavily blotched with brown; Louis van Houtte (1887), pale yellow, long dark blotches;

Mirabeau (1887), dwarf and strong spike, erect flowers, sulphur-yellow; and Pactole (1888), the deepest yellow, with black spots.

Rosy and Carmine.—W. E. Gumbleton (1883), a tall spike of large round flowers, carmine, with violet spots; Voltaire (1885), a fine rosy violet flower with purple and yellow spots; Beaurepaire (1889), very large flowers, bright rose, with purple spots.

Salmon and Brick-coloured.—Lamartine (1885), Duguesclin (1888), Lamarek (1888), Ferdinand Bergman (1889), very large flowers, carried on tall spikes of various shapes and markings.

Red.—Masque-de-fer (1883), dull red flower, with two entirely black lower segments, very peculiar appearance; Bossuet (1885), large blooms of a bright scarlet; Marquis de Saporta (1886), cinnabar-red, with yellow and purple spots; Vésuve (1886), velvety dark red; John Laing (1889), an enormous flower of perfect shape and substance, vermilion, with purple spots.

Purple.—Gambetta (1884), a tall, erect spike, violet-purple; M. Lévêque (1888), a perfect shape, the darkest crimson.

Violet.—Emile Gallé (1887), large violet flowers with darker spots.

As may be seen from the above descriptions, almost every colour is to be found in the different varieties, which together form a quite distinct and separate group, for they all have such an evident appearance of consanguinity, which the variation in their colours is unable to conceal, as to make a strong impression on anyone who has the opportunity of seeing them exhibited side by side with a collection of the Gandavensis group. In the latter group one wonders at the soft shades and delicate hues, the predominance of pink and rosy colours, the stately appearance of their high, well-furnished spikes, and one moves back some steps the better to see and to appreciate the general effect of the whole exhibit. When looking at Lemoine's Gladioli one is struck with amazement at the contrast of colours; for here, in almost every variety, let it be white or yellow, pink or red, you will observe a very dark and striking blotch, surrounded with a yellow space, which is the distinctive mark of the whole race. To be able to judge them you must come nearer and look at the oddness of the markings in almost every individual

flower. You were admiring the *Gandavensis* at a distance ; but you will find the others all the finer as you gaze at them nearer and for a longer time.

What is most astonishing to those who study the great improvements made with hardy hybrid *Gladioli* in so short a period is the almost unlimited natural variation, which has allowed us to obtain and to preserve by selection colours which were quite unknown in the various kinds of *Gladioli* previously in cultivation. We can easily understand that, starting from a species with yellowish flowers, we should find in the offspring a strong proportion of yellow shades ; but what is less easy to comprehend is why these yellow tinges are far deeper and purer in the hybrids than in either *G. purpureo-auratus* or any of the *Gandavensis* hybrids, and that we also get bright scarlet and orange-coloured blooms ; and it is altogether out of our power to understand how it is that we obtain plants with nearly blue flowers ; nor can we determine which of the two parents must be charged with the paternity of such new colours as are unknown in the *Gandavensis* group, and impossible to perceive in the small yellow *purpureo-auratus*. We are, therefore, inclined to believe that hybridisation generally extends considerably the bounds of natural variation, and produces in the offspring shapes, sizes, and colours which were quite unknown in either of the original parents, and which would never have appeared had not the mixture of two different types disturbed and greatly diminished the heredity of both types. This theory will appear even more probable if we study the transformations imparted to the hardy race of *Gladiolus* through the influence of the new species *Gladiolus Saundersii*.

*Gladiolus Saundersii** was sent to Mr. Wilson Saunders, of Worthing, by Mr. Thomas Cooper, a collector of plants in Natal. It flowered for the first time at Kew, and a coloured plate of it was published in *The Garden* of July 27, 1877, from a plant which had been in flower the year before in Messrs. E. G. Henderson & Son's nurseries. It is a rather dwarf species, the spikes not being more than 2 feet high. The short leaves are of a pale, glaucous green, and the slender foot-

* *G. Saundersii* was first described by Sir J. D. Hooker in the *Botanical Magazine* in 1870, sub. t. 5873. The drawing was made by Mr. Wilson Saunders from a plant flowered in his garden at Reigate.—ED.

stalks bear a few flowers, which would be large-sized were the segments fully expanded instead of being reflexed. As in *G. purpureo-auratus*, the flowers are arched at a short distance from their insertion, and, unfortunately, bent towards the ground. The colour is a pale scarlet, while the throat and the three lower segments are profusely covered with white and pink dots. This plant rarely produces fine specimens in our country, although it is quite hardy without any shelter; and everybody knows that winters in the north-east of France are peculiarly severe.

Amateurs were not long in appreciating the interest of crossing *G. Saundersii* with the beautiful garden hybrids, and the first such attempt appears to have been made by M. Max Leichtlin, of Baden-Baden. This amateur nurseryman published in 1882 the results he had obtained by crossing some varieties of *Gandavensis* with the new species. Its influence was made manifest by a considerable increase in the size of the blooms. M. Leichtlin spoke of some of his hybrids measuring as much as 4 inches across, and even more, and producing a large variety of shades.

Apparently Max Leichtlin did not make so much of his discovery as one might have supposed he would have done; his collection was scarcely distributed in the trade. I was told he had offered the whole set of his novelties to the chief raisers of *Gladioli* in England, and finally sold this stock to American nurserymen. However, some years later, M. Godefroy-Lebeuf, of Argenteuil, offered for sale some specimens of Max Leichtlin's hybrids in unnamed sorts. We secured some of these varieties from M. Godefroy-Lebeuf, as well as another that Max Leichtlin was kind enough to send us, for we were anxious to compare them with the hybrids that we had just raised ourselves by crossing our hardy spotted *Gladioli* with *G. Saundersii*. We ascertained that Max Leichtlin's were generally vigorous plants, carrying tall and strong spikes with large flowers, and would reward anyone who would try to improve them, both in colour and substance.

In the course of the summer of 1883 we made our first experiments in crossing *G. Saundersii* in M. Victor Lemoine's garden at Nancy. To secure the success of the operation this species was grown under various conditions, some of the subjects of the experiment having been planted in the open ground and

some in pots, of these last some being left out of doors and some cultivated in a greenhouse. And whereas Max Leichtlin had used for his hybridisations some Gandavensis varieties, we were careful to employ in our experiments only the most characteristic of Lemoine's blotched hybrids.

While the pistils of *G. Saundersii* were being impregnated with the pollen of the above, the reverse cross was also tried, and many spotted sorts were fertilised with *G. Saundersii* acting as male parent. It is known that Saunders' Gladiolus seldom yields fertile seeds; and in a large quantity of developed ovaries we found only four seeds, which, however, came up and flowered in 1885, and out of which were chosen the two beautiful sorts named afterwards President Carnot and Maurice de Vilmorin, both so remarkable for their great size and the strange appearance of their dotted spots. The seeds which resulted from the reverse hybridisation came up in much larger number, and produced many fine sorts, none of which, however, offered so wonderful an opulence of colour, nor such characteristic shapes.

Thus originated the new hardy race of *Gladiolus nanceianus*, to which further fertilisations imparted a great variety of colours and good-sized spikes, as well as still more prominently dotted blotches, which are quite a peculiar feature of this group. Nine of these hybrids were offered for sale in 1889; and a larger number, quite as beautiful and still more distinct, have been kept in store, waiting for names. Many amateurs were able to acquaint themselves with them at the Paris Exhibition of 1889, and at last year's meetings of the Royal Horticultural Society of Great Britain, where Messrs. J. Veitch & Sons had the kindness to stage the blooms of a few varieties, which were awarded certificates. To give an idea of the characters of the whole group, it will be enough to describe the variety President Carnot, which may be considered as the typical form of the series, as the other sorts, while different in colour, are very similar in shape. President Carnot is a plant of great vigour, with dark green leaves and spikes 6 feet high, carrying large-sized flowers. It is not unusual to find flowers measuring more than 7 inches across, between the tips of the two lateral segments of the corolla, which are developed in the form of two large triangular, fully expanded wings. The upper segment is quite upright and very long, and the three lower petals, of

rounded shape, still further embellish with their pleasing disposition the perfect symmetry of the flower. The general colour is a soft cherry-red, more or less striped with carmine on the edges; the lower segments are covered with a purple-scarlet blotch, surrounded, as it were, with a profusion of small drops of blood on a white ground, and numerous white dots on a rosy ground. The flowers are quite open, and look you straight in the face.

Among the other varieties we may mention P. Duchartre, a dwarf plant, carrying enormous copper-red flowers, the lower segments being completely covered with dark maroon dots; Comte Horace de Choiseul, orange-red, with purple and yellow markings; M. Hardy, crimson or very dark carmine, with purple blotches and yellow dots; Maurice de Vilmorin, a singular flower, where every sort of shade is to be found in a mixture, slate-coloured blue with a violet hue, the blotches pointed with purple, blood-red, and yellow—an advance towards the blue.

A single glance at the flowers of *G. nanceianus* makes one wonder to see how much they differ from the species from which they originated. *Gladiolus Saundersii* is a dwarf plant with weak stems and hooded blooms, humbly bent towards the ground. *Gladiolus nanceianus* possesses strong, upright spikes and fully expanded flowers, boldly looking upwards. Saunders' species is of a pale vermilion colour; the Nancy Gladioli are bright-coloured flowers, in which red, crimson, carmine, and even bluish shades are met with, and it impossible to say to what extent this variation of the colour may not be pursued.

M. Froebel, of Zurich, offered for sale last year, under the name of *Gladiolus turicensis*, a variety raised from a cross between *Gladiolus Saundersii* var. *superba* and *G. gandavensis*. From the description which was published of it last autumn in an English horticultural paper it must be a fine, vigorous plant. Although we applied to M. Froebel, praying him to send us a bulb of his novelty, we received nothing, and are therefore not able to describe it as it probably deserves.

Some words, in conclusion, about the cultivation of Gladioli. I shall not speak of the manner of growing and forcing early varieties, in pots or frames, which the Guernsey and Jersey specialists are managing so well; nor of that of the Gandavensis hybrids, which is, I imagine, perfectly well known here; and

growing the new hardy Gladioli is so easy that it will not take long to explain.

Under the denomination of hardy hybrid Gladioli fall the varieties both of *G. Lemoinei* and of *G. nanceianus*, as both equally withstand our severe winters. They must be planted in exactly the same way as the Ghent Gladioli, and successively in March, April, and May. If you take care to plant first the earliest varieties, such as Mme. Lemoinier, Vésuve, Mlle. Thérèse Lambert, A. Thiers, Lamarck, Ferdinand Bergman, P. Duchartre, &c., you will be able to get the first flowering spikes before July 15, and the bulbs will continue to bloom in rotation until frost comes. In general, the hardy hybrids are earlier than *Gandavensis*: they admirably fill the gap between the early-flowering and the *Gandavensis* section.

In such countries as England, where winters are rather wet than cold, most classes of Gladioli sufficiently withstand the frosts. It is not the same with us, in the east of France, and it is for hardy Gladioli a most invaluable quality to be able to stand against all frost in the open ground, sheltered with only one or two inches of straw or leaves. However light it may be, this shelter is always sufficient, and bulbs preserved in this way start again readily in the ensuing spring, and give as beautiful spikes as the year before. This hardiness is not of great moment to amateurs who are in the habit of lifting their *Gladiolus* bulbs every year; it is the same with the trade growers, who need to keep the bulbs in their warehouses ready for sale and shipment; and in any case it is good to lift the bulbs every two or three years, in order to divide the clumps and to replant the bulblets.

But these hardy Gladioli possess a quality which is, in my opinion, of far greater importance. They are able to shoot up vigorously, to send forth strong spikes, to enlarge their bulbs, and to increase themselves by means of bulblets, *in every kind of soil*, either wet or dry, either of stiff clay or of light sand. I do not know whether, in the climate of England, the growing of ordinary garden Gladioli is liable to any failure; but I am perfectly aware that there are in our country many places quite unfit for their cultivation; the soil of our nursery at Nancy, a stiff clay ground, may be taken as an instance of it. Imported bulbs of *Gandavensis* thrive well and yield good spikes the first year; in the following season the leaves grow yellowish and the

flowers inferior in colour, size, and substance, and the bulbs are smaller; the third or fourth year they are nearly lost; whereas in the most varied situations in our soil these hardy hybrid Gladioli have always succeeded equally well, let the season have been dry or wet, hot or cold. The fine sorts of Gandavensis may be preferred by some, but to every true lover of the Gladioli whom an unfavourable soil or climate forbids to grow them I shall say, try the hardy Gladioli, and they, at least, will not disappoint you.

THE GLADIOLUS.

By Mr. J. KELWAY, F.R.H.S.

[Read September 9, 1890.]

MR. CHAIRMAN, Ladies, and Gentlemen,—You have paid me a great compliment in asking me, through your secretary, Mr. Wilks, to tell you, and through you the world at large, what I know concerning the propagation and cultivation of the Gladiolus.

In attempting to comply with his request, which I do with the greatest pleasure, I shall confine my remarks solely to that portion of the genus commonly known as Gandavensis.

I have cultivated the Gladiolus for sixty years, from the time that *G. psittacinus* was first introduced into this country. I have had great success, and some failures. I have grown a large number of the species that have been introduced into this country and nearly all the hybrids that have been put into commerce. All are of great beauty and very interesting to lovers of flowers; but I came to the conclusion many years ago that, as a decorative plant, none could compare for grandeur, grace, and beauty with the Gandavensis hybrids. This was what induced me to take it in hand as I have done. In no garden, however small, can they be out of place, and few subjects are better adapted for arrangement in vases in the house, on the exhibition table, or for general decoration. It is also the most enduring flower we have in general use, for a spike cut when a few pips only are open and placed in water will last for at least a fortnight. You all know the Gladiolus of which I speak, the one most generally grown far and wide throughout the British Isles,

all of whose varieties look you so boldly in the face as you pass, conspicuous objects as they are in every border by reason of their size of flower and delicacy of tint. They are descendants of the Parrot Gladiolus—*G. psittacinus*—a species imported from South Africa in 1830. There can be no doubt that *G. gandavensis* was a variety raised by Dean Herbert from *G. psittacinus*.* He grew this production of his, but failed to bloom it. Herbert sent it to Van Houtte, who tried to flower it at Ghent, but failed also, and sent it to the Cape, where it first flowered. It was sent back to Van Houtte, who named it, after Ghent, *G. gandavensis*, propagated it, and put it into commerce. We are indebted to the late M. Souchet, who was gardener to the French Court, for the first hybrids of this section. I visited him at Fontainebleau in the year 1874, when he told me that he commenced crossing *G. cardinalis*, *G. blandus*, and others in 1834. With pollen from the hybrids he thus obtained he impregnated *G. gandavensis* and produced numerous seedlings, some of which flowered in 1845. The first of these hybrids which he put into commerce he named M. Blouet.

It was in the year 1857 that I first obtained through M. Souchet's agent in Paris all the best varieties of his raising which were then in commerce, and in the following year I obtained from these a tolerable quantity of seed. In order to accomplish this I found it necessary with many of the choicer kinds to use artificial means in impregnating the flowers, as many will not produce seed without it, and we have no insect in this country so formed as to be able to take this task upon itself. It may be done in two ways: either by cutting out the stamens when the pollen is ripe, and applying them to the pistils of the flower from which one wishes to obtain seed, or by means of an ordinary paint brush of small size.

To illustrate the necessity for using artificial means I shall select a strong spike, say of Lassia, one of the best of the scarlets, and as soon as the first flowers are expanded take the pollen from another good variety, as, for instance, the pure white Mrs. Dobree, and commence operating upon the expanded blooms upon the right-hand side of the spike. I shall proceed daily as the flowers open until the whole of those upon the right have been done, labelling every bloom with the date and the state of the weather

* On the origin of *G. gandavensis*, see note, p. 574.

each day. The result will be that the flowers which were operated upon on hot, bright days form seed. Whereas those on the left side, which were not fertilised, as well as those on the right side, which were impregnated upon dull or wet days, form no perfect seed. Care should be taken that all spikes operated upon be tied securely to stakes and marked with labels. When I first commenced saving seed I naturally concluded that the colours of the flowers of seedlings would be similar to the colours belonging to the parents; but by experience I found that seed saved from Norma, a pure white variety, produced all the other colours found in the Gandavensis tribe except white. I therefore gave up recording the parents of seedlings as useless. The best time to select for crossing one *Gladiolus* with another I find to be about ten o'clock in the morning upon a dry day. It is important to select for the purpose varieties of high quality, such as Shakespeare, Lassia, Marcianus, and Duchess of Edinburgh, which possess strong constitutions, with the individual blooms of large size, good shape and substance, with colours bright and well defined. The spike should be strong and boldly erect, carrying not less than eight to ten blooms out at one time, and bearing these blooms naturally, well to the front and regularly placed. The seed should be gathered as soon as the pods begin to burst—spread in an airy loft, and, when dry, threshed and stored in a dry place until the first week in April, which is the best time to commence sowing, which should be carried out as follows: Select an open situation and have the ground well dug over in the autumn, that it may have the benefit of the frost. Early in the month of March it must be raked over and made as fine as possible.

The most convenient way in which to mark out the ground previous to sowing is in 4-foot beds with 2-foot paths between. Drills should be made about 6 inches apart, and half an inch in depth. After these drills are made I press the soil with a piece of wood 4 feet long and 2 inches thick, and of a triangular shape, with a handle attached at either end: this ensures an equal depth of soil throughout. When the seed is sown it should be covered with a mixture of fine sifted soil and sand in equal parts. No other care is required but in keeping the beds free from weeds and in seeing that in dry weather they obtain an occasional watering.

In order to raise stock from spawn or bulblets, which are formed at the base of the corms, they should be carefully cleaned off and stored in a dry place until April, when they should be sown in the open ground in drills in every way as is done with the seed, except that they will require to be covered at least 2 inches deep. These small corms should be taken up about the first week in September, before the foliage dies down, and, after being washed quite free from earth, should be dried off and spread in shallow trays until planting time.

I had an experiment some fifteen years ago with sorts that are shy in producing spawn, when I tried the method of making stock which finds favour with some—that of division of the corm. About 80 per cent. grew and did fairly well, the remainder entirely perished, so that the stock was not much increased, and certainly much weaker on account of the division, which is very natural, as we divide the strength which the bulbs had stored up the previous year. For exhibition spikes it is certainly detrimental. It seems absurd to the practical cultivator to give many trivial details on the cultivation of these plants which may prove of the greatest moment to the beginner.

CULTURE FOR EXHIBITION.

I have grown the *Gladiolus* in every kind of soil, and have used nearly every kind of manure. I have planted in the autumn and in every month from January until June.

But the first consideration in successfully cultivating this bulb is, without doubt, the preparation of the soil, for, however naturally good the land may be, or whatever time the bulbs are planted, unless the soil is brought into a good tilth all will end in disappointment. It is a remarkable fact that I, at Langport, lack the very soil which is usually recommended—namely, black sandy loam, such as I well remember seeing Mr. Standish cultivating his *Gladioli* in at Ascot. If the soil is a stiff loam on clay it should be drained; but if on the chalk or gravel this is not necessary.

In September, or early in October, when the land is in a dry state, lay on a liberal quantity of stable or cow manure; spread the manure and dig deeply with a fork in order to mix it well with the soil. Then allow the land to lie rough until the latter part of

February or the beginning of March, until it is once more so dry as not to clog the feet when walking over it. It should then be hacked over at least 6 inches deep with a potato-hoe; when this is done drill out the whole piece in drills 18 inches apart and 3 inches deep, and mark it out, by means of lines across and at right angles to the drills, into beds of 4 feet wide and with paths 2 feet in width.

Commence planting by placing a corm against each line and filling up the space with two, three, or four corms according to their size. If the corms are very large, four in a row will be found quite sufficient. When one bed is finished, cover in neatly with a rake, remove the lines, and proceed to the next.

Planting thus in beds is preferable, as it affords the cultivator facilities for examining and tending individual spikes without danger to the rest.

In this way continue planting, at intervals of a fortnight, from the end of February until the 20th of May, and you will extend the succession of bloom from the commencement to the end of the season, which is usually the end of November, unless the flowers are previously destroyed by frost.

The plants will require no attention until they commence to show signs of blooming, except in keeping them quite free from weeds. When signs of blooming are apparent stimulants may be advantageously applied. I have for the last twenty years used a preparation of my own, which I dissolve in water and apply about once a week according to the state of the weather. Stakes will now be necessary for any spikes specially required for exhibition, and these when fixed in the ground should not reach higher than the lowest bloom, as when a taller stake is used the flowers are liable to be injured by friction against it. Mulching is also now necessary—in the first place to keep down the weeds and secondly to keep the ground moist. I formerly used rotten manure for this double purpose, but find that straw-chaff is quite as efficacious, and it is much nicer and cleaner to walk upon when tying or cutting the spikes.

If the weather should prove very dry during the season, a liberal supply of water should be given, but some judgment is required, particularly where the soil is of a clayey nature, as it often happens that heavy watering or much rain followed by low temperature causes the fibrous roots to perish, resulting in a

sickly yellow tint amongst the leaves—an undesirable result, erroneously called by many of the uninitiated a disease.

The time of lifting the corms should be carefully attended to, as it is a point of great importance in preventing their decay. No harm will arise from early lifting, even if it is done as soon as the spikes of bloom are cut; but, on the other hand, if the *Gladiolus* be left in the ground after signs of its decay are apparent, by the foliage turning yellow, then the corms of the most delicate sorts will gradually perish.

The various causes of this premature decay are low temperature, undrained land, heavy soil, and too much moisture.

From this decay proceeds the greater part of our losses, and the skill of the cultivator is taxed greatly to devise the best way of combating the sudden and extreme changes of weather which we experience in our uncertain climate. A great deal has been written upon the disease and degeneration of the *Gladiolus* in this country, and, from my long experience in its cultivation, no doubt it will be expected that I should make some allusion to it.

All sorts of conflicting opinions have been expressed regarding it, some having described it as so bad as to threaten its utter extinction. I will just state what two of our greatest amateur growers have written. One says: “In a large collection there are always a number of plants of which the stalks die off prematurely; the best way is to pull them up and tie them in bundles to burn. Some growers consider this a disease, but it is probably nothing but degeneration, as no trace of disease is apparent in the corms.” The other says: “I grew a root of *Célimène*, which I imported from France. The corm threw up two shoots and formed two new corms, both of which are fearfully diseased. This being an imported bulb, it is not owing to its cultivation in England. I have observed the same premature dying off in a seedling bed, when degeneration cannot be laid to its charge.” So that one of these gentlemen says that the cause of failure is probably degeneration, and the other disease, and adds: “I have no remedy to propound. I consider it analogous to the potato disease; it is not fungus, though fungus comes afterwards, and it is contagious.”

Similar results occur with many of our hardy plants, and I have no doubt that nearly everyone present has noticed in pass-

ing through agricultural districts the yellow sickly appearance of our fields of wheat in the months of March and April; but no one would think of banishing the cultivation of wheat from this country through an occasional failure.

I do not believe that any disease or degeneration exists in the *Gladiolus*, but that the spots found upon the corms are simply the result of the cold and wet destroying the fibrous roots, which naturally deprives the plant of nourishment and impairs its vitality, so that it commences to decay.

Following upon this weakness and decay comes the fungus, which preys upon the corm, and which has been quoted by so many as the primary cause of the languor instead of the result of impaired vitality.

If the plant be taken up as soon as this languor is visible, upon examining the fibrous roots the first signs of decay will be found in them, which proves that the decay does not originate, as many suppose, in the foliage (as in the hollyhock) or in the corm (as in the potato tuber), there being no sign of it in either. But if these corms be not instantly removed from the soil and gradually dried off, they too will become affected and gradually perish. It is often found that those lifted late one year will, during the next, be affected by decay, which, no doubt, was generated the year before whilst in the ground.

The parents of these hybrids, as is well known, were natives of a much hotter climate—that of South Africa—and we must therefore expect that our climate will, especially in some seasons more than in others, be prejudicial to many of the most delicate kinds.

Therefore, when this sickness is visible, I strongly recommend early lifting as a preventative of actual loss—as life will thus be secured to the bulbs—but, when taken up, they must be immediately spread in the shade and gradually dried off.

But I do not recommend this course being adopted except in these cases of premature decay. Practical knowledge must be used in carrying out every detail, as in the cultivation of all plants. No man can be a successful cultivator from books alone for there are peculiarities of which the grower alone knows, and which he can know only by experience. There is always a stumbling-block in the way of the unsuccessful: the soil is too heavy or too light, the water is too hard, we are on the clay or

the gravel, and so forth ; but these are simply excuses for their want of success, for the Gladiolus, properly treated, can be grown to perfection in this country.

EXHIBITION.

I believe that the subject of these remarks is generally acknowledged to be pre-eminent upon the exhibition table during the autumn months, on account of its grandeur and brilliancy of colouring.

Although its season of flowering is rather long, August 25 is about the date in the south of England when we can generally cut the finest stand of blooms. The method usually adopted for setting up the spikes, and which I now use, is one which I invented and first used at one of the Society's meetings in 1868. Various kinds of foliage have been called into requisition as a background, but there is no doubt but that the natural foliage of the plant suits this flower better than any other, and no other is so effective in throwing up the brilliancy of the flowers.

The best time to cut the spikes intended for exhibition is about five o'clock in the morning ; at this time only can the flowers be seen in the freshness of their beauty, the dew hanging on them like pearls.

We are obliged to cut upon the day previous to the show, and after being cut they are taken to the cut-flower room and arranged in water in the show-cases ready for exhibition. Despatched by the night train they arrive quite fresh for the next day's show.

When at Fontainebleau in 1874 I had a conversation with M. Souchet, and also with M. Vilmorin, of Paris, upon what they considered perfection. It seems that the French raisers prefer the spike to be long, the flowers evenly disposed, and standing quite independently of one another, so that you may see between them. They consider our spikes heavy and lumpish, theirs light and elegant.

I shall now describe what I consider a perfect plant—one of robust habit, strong constitution, and tall growth, the spike long, and carrying not less than eight or ten blooms at one time, the foliage broad, the flowers so disposed as to come naturally to the fore, and to just touch one another, and so to completely hide

the stem. The individual blooms should be four to five inches across, the petals broad, and of good substance and endurance, not inclined to curl at the edges; the ground-colour pure, but if containing two or more tints the flakes should be of a deeper shade, and the lines in the centre of the petals should be clearly defined.

POT CULTURE.

The *Gandavensis Gladioli* are not good subjects for culture in pots. But if it be desired to have them late for decorating the conservatory, they may be grown with tolerably good effect. The corms should be potted singly, in 6-inch pots, about the end of May, using a rich compost of good yellow loam, old hot-bed manure, and silver sand. They should then be plunged in a bed of very rich soil, placing the rims of the pots about two inches beneath the surface. In dry weather they will require to be kept tolerably moist with frequent waterings. As soon as frost commences the pots should be lifted and placed in a cold greenhouse or vinery, and brought into the conservatory as soon as the first buds begin to open.

FIELD CULTURE.

I have proved that the *Gladiolus* can be grown satisfactorily in the open fields, by horse cultivation, in almost any soil or situation. I grow them at Langport to the extent of twenty-five acres. The land is double-ploughed or sub-soiled twelve inches deep, in September or October, dry weather being chosen (it should never be done when the ground is in a wet state), and about 100 tons of manure per acre are then carted out upon it. I am not particular as to the kind of manure, but buy all I can in the neighbourhood—horse, cow, or pig manure are all equally good for the purpose. This is spread over the newly ploughed land and thoroughly worked in with heavy harrows, so as to mix it well with the soil. The latter is allowed to remain in this state until March, or until the land is in a fit state for horses to work it; it is then again harrowed and made as fine as possible, and struck out into drills fifteen inches apart and three inches deep, with a turn-furrow plough.

When the land is thus made ready for planting the latter is begun, if the weather be dry and fine: this date is, upon the average, March 10. I plant the corms about six inches apart in

the drills, covering in with a hoe. As I remarked when speaking of growing for exhibition, nothing more is required until the blooms commence to show, except frequent hoeing to keep the weeds down; but for water we have to look to the clouds, and they are not usually backward in supplying us.

As soon as blooming commences the rows are gone over daily in order to correct any mistakes in sorts that may have occurred. This "rogueing" is also carried out before planting, for by taking off the outer skin we can tell by the colour of the corm underneath whether it is true to its kind. The men employed in this become very expert in correctly separating the true variety from the "rogue." Every spike, except those specially selected for seed-bearing, is cut. This is done for two reasons: for the sale of the blooms, which is extremely large; and also to prevent exhaustion in the corms. Of course, the quantity of spikes cut from twenty-five acres of Gladioli is enormous, averaging 15,000 weekly; they are sent to every part of the country, and give constant employment throughout the season to ten or fifteen hands in cutting and packing.

It is about the first week in September that I commence to take up and store. All Gladioli should be lifted before the foliage has died down, for if they be taken up as soon as the leaves turn yellow they retain more vitality than if allowed to remain in the ground until late in the season.

After lifting the smaller corms or bulblets, to which I referred in the first part of my article, and which we always plant and lift before the larger, we do the same with the latter, commencing with those which were planted early in the season, as they naturally ripen off before those planted late. In doing this we are careful to take first those that show most signs of ripeness, never allowing any to really die down, as the best bulbs are always found to be those which were lifted early, even though the leaves were still green, and, besides this, these bulbs will vegetate more freely than those taken up after the foliage has died down.

The majority of corms left in the ground until very late invariably show some signs of decay, but if a contrary treatment be pursued they will probably be found quite sound, with a perfect outer covering and devoid of spot upon the inside. It is of very great importance to see that all corms, as soon as taken

up from the ground, be spread in some airy shed, or in the open air when fine, and thoroughly dried off before being stored away.

Before closing my remarks I shall give the names of twelve of the best English-raised sorts; the colours and descriptions are set forth in the published catalogues. Several of these will be found in my exhibits here to-day:—Appianus, Caliphon, Duchess of Edinburgh, Lady Carrington, Lassia, Marcianus, Mrs. Dobree, Mrs. J. Eyton, Rev. H. D'Ombrain, Prince Henry, Shirley Hibberd, Sir Trevor Lawrence.

And now, Mr. Chairman, Ladies, and Gentlemen, it is time that my remarks came to an end, and I can only hope that what I have said may induce many more amateurs to take up the cultivation of these plants as a speciality, and if they succeed in growing and exhibiting varieties of extra quality, they will, I feel sure, be amply rewarded for the slight trouble it has cost them; for, although difficulties and disappointments will occur in the culture of every flower, yet by patience and perseverance these defects can be overcome, and will prove nothing in comparison with the pleasure afforded to all ardent admirers of flowers.

ON THE ORIGIN OF GLADIOLUS GANDAVENSIS.

A QUESTION having been raised as to the origin and parentage of *G. gandavensis*, it may be well to reprint the two following extracts:—

Flore des Serres et des Jardins de l'Europe, rédigée par Louis van Houtte, mars 1846, 3^e liv. pl. 1. "*Gladiolus gandavensis*.— . . . L'histoire d'une telle merveille ne laisse pas, en présence d'une telle splendeur, que d'être curieuse à connaître. Cette plante est née dans les jardins de Monseigneur le duc d'Arenberg, jardins si renommés en Europe pour les richesses végétales qu'ils renferment, d'une fécondation hybride opérée entre le *Gladiolus cardinalis* et *natalensis* (*psittacinus*), et chose remarquable, elle dépasse de beaucoup ses parens en hauteur. M. van Houtte . . . n'eut pas plutôt connaissance de ce glaïeul, que le jugeant

. . . multo dignandus honore (*Horace*),

qu'enthousiaste de tout ce qui est vraiment beau en fait de plantes,

. . . amor urget habendi (*Virgil*),

et bientôt une grande partie de l'édition est sa propriété. C'est donc à lui qu'on en doit la dispersion" &c.

“CH. LEMAIRE.”

Dean Herbert, writing in the *Journal* of our own Royal Horticultural Society in the year 1847, vol. ii. page 89, says:—“The showy *G. natalensis* (called also *psittacinus*) of the Natal country, which endures more frost than any of the southern Gladioli, though it suffers much from July rains in many positions, has been freely crossed by myself, by Mr. Belfield, by Mr. Bidwill, and by cultivators on the Continent, with *G. oppositiflorus*, a Madagascar plant, found, perhaps, also in Kaffraria, and often improperly called in shops *floribundus*—an old name for a very different plant. The cross named *G. Gandavi* (for the adjective name Gandavensis to a garden cross is very objectionable) has been figured in the beautiful Ghent periodical work of M. van Houtte. It is there stated most erroneously to have been raised between *G. natalensis* and *cardinalis*. It flowered in Ghent for the first time in Europe, the soil and climate being more congenial to Gladioli there than at Spofforth and in the west of England, but some of the seedlings raised in Devonshire and taken to Sydney had flowered earlier.”

To these two extracts Mr. J. G. Baker, F.R.S., says:—“All that I can add is, that you find nine-tenths of *G. gandavensis* and *brenchleyensis* ready to your hand in *G. psittacinus* (*natalensis*), and I think the other tenth is much more likely to have come out of *G. cardinalis* than out of *G. oppositiflorus*. It is not unlikely that the white varieties of *G. gandavensis* may be hybrids between *G. psittacinus* and *oppositiflorus*. Since 1847 *G. oppositiflorus* has been refound in Kaffraria, not in Madagascar, and I expect Madagascar was a mistake.

“J. G. BAKER.

“Kew, Oct. 16, 1890.”

EXTRACTS FROM THE PROCEEDINGS
OF THE
ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETING.

JANUARY 14, 1890.

JAMES DOUGLAS, Esq., F.R.H.S., in the Chair.

ELECTIONS.

Fellows, 46.—Rev. A. B. Alexander, J. Ednie Brown, F.L.S., Thomas Robert Butler, D. Campbell-Brown, T. H. E. Compton, John Cooper, junr., De Barri Crawshay, Mrs. M. Crossfield, Mrs. C. Curwood, Alexander Dean, S. H. Dean, James Taylor Diamond, John T. Gabriel, Rev. G. E. Gardiner, F. T. Good, Mrs. Grinling, Mrs. M. Grove, Everard Alex. Hambro, John Henderson, W. H. Hudson, Charles Jeffries, F. W. Justen, Herbert Howard Keeling, Henry J. Kershaw, John Laing, W. B. Latham, Thomas Laxton, Miss Agnes Mellish, Arnold Moss, Richard R. B. Orlebar, William Owen, Rev. F. Page-Roberts, W. W. Palmer, Charles Pennell, Frederick A. Philbrick, Q.C., F. W. Prior, Hugh Pye, Joseph Rawlings, W. M. Rose, Miss Rotch, George Steel, Arthur J. Veitch, J. C. Wakefield, Henry Wallis, A. C. Wheeler, the Viscountess Wolseley.

Associate.—John Slack.

A paper was read:—"On a Method of Winter Gardening," by the Rev. W. Wilks, M.A. (Sec. R.H.S.), Vicar of Shirley.

FLORAL COMMITTEE.

Dr. MASTERS, F.R.S., in the Chair, and seventeen members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. James Veitch & Sons, Royal Exotic Nursery,

Chelsea, for a beautiful and interesting collection of cut Pitcher-plants (*Nepenthes*), consisting of 45 species and hybrids.

Bronze Banksian Medal.

To Mr. H. B. May, Dyson's Lane Nurseries, Upper Edmonton, for a large and effectively arranged group of well-grown Ferns.

Awards of Merit.

To *Pteris serrulata gloriosa* (votes, unanimous), from Mr. H. B. May; a very fine "crested" form, of good habit.

To *Primula sinensis* Eynsford Pink (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley; a rosy-pink flower of good shape.

To *Primula sinensis* Her Majesty (votes, 9 for, 1 against), from Messrs. H. Cannell & Sons; a large pure white flower with a greenish-yellow eye.

To *Primula sinensis* Eynsford Red (votes, unanimous), from Messrs. H. Cannell & Sons; bright shaded crimson flower.

Other Exhibits.

Messrs. Paul & Son, the Old Nurseries, Cheshunt, sent *Spiræa astilboides* in flower, to show its value as a winter-forcing plant.

Messrs. Walshaw & Son, nurserymen, Scarborough, sent cut flowers of a dwarf variety of *Richardia æthiopica*. The Committee expressed a desire to see a plant in bloom.

His Grace the Duke of Devonshire, Chatsworth (gardener, Mr. O. Thomas), sent *Hippeastrum* (*Amaryllis*) *aulicum*, var. "Prince Albert," a bright scarlet-flowered variety.

Messrs. Barr & Son, Covent Garden, sent *Galanthus Elwesii*, Crocuses in variety, and *Narcissus minor*.

ORCHID COMMITTEE.

Sir TREVOR LAWRENCE, Bart., M.P. (President R.H.S.), in the Chair, and fourteen members present.

Awards Recommended:—

First Class Certificate.

To *Dendrobium xanthocentrum* × (votes, 10 for, 3 against), from Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White). A hybrid of *D. Findlayanum*, with flowers of the same form as in that

species, and much resembling *D. melanodiscus* ×, but not exhibiting the heavy brown blotches at the base of the labellum, which is almost wholly orange colour, and with but two small dark-brown marks on each side of the lip beneath the column.

To *Dendrobium Juno* × (votes, unanimous), from Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White). This fine hybrid is the result of a cross between *D. Wardianum* and *D. Lina-wianum* (moniliforme). Its flowers much resemble those of *D. nobile nobilius*, but the labellum has much of the form of *D. Wardianum*, and with the dark blotch on the orange-coloured base of the labellum as in *D. Wardianum*.

To *Dendrobium Luna* × (votes, 11 for, 2 against), from Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White). A hybrid between *D. Findlayanum* and *D. Ainsworthii* ×. Its features may be recalled by likening it to a nearly white *D. Findlayanum*, the only colour in it being a pale pink flush over the tips of the segments, and a sulphur yellow base to the labellum.

To *Dendrobium Macfarlanei* (votes, unanimous), from Messrs. James Veitch & Sons, Royal Exotic Nurseries, Chelsea. This is an extraordinary and beautiful introduction from Torres Straits. The plant resembles a slender *D. suavissimum*, and its flowers are borne on upright spikes, often a dozen on a spike. The flowers, which are snow-white with the exception of a few violet marks on the side lobes of the labellum, are between three and four inches across, and resemble in general appearance a white *Lælia anceps*. The small plant which Messrs. Veitch exhibited had two flowers.

To *Lælia anceps Schröderiana* (votes, unanimous), from Baron Schröder, The Dell, Staines (gardener, Mr. H. Ballantine). The exhibition of the true form of this fine white *Lælia anceps* definitely settles the oft-discussed question as to its relation to *L. a. Stella*, which appears in some gardens under the name "Schröderiana." As exhibited in Baron Schröder's plant, the front lobe of the labellum appeared flat, wavy at the edge, not deflected at the tip, and not displaying any opening between the middle and the side lobes, all of which alternative features are seen in *L. a. Stella*. *L. a. Schröderiana* is therefore the better flower from a florist's point of view.

Award of Merit.

To *Dendrobium nobile*, Burford variety (votes, unanimous),

from Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White). This is another extension of the *D. nobile* Cooksoni section, in which the petals partake of the character and colouring of the labellum (trilabellia); in the Burford variety the influence of the labellum is seen on the inner halves of the two lower sepals, the trilabellia being thus made up of two segments of the outer plane and one of the inner.

Cultural Commendation.

To E. Ellis, Esq. (gardener, Mr. G. A. Glover), for a fine specimen of *Lycaste plana* with many flowers.

Other Exhibits.

Sir Trevor Lawrence, Bart., M.P., exhibited three examples of abnormal forms of *Dendrobium nobile*, viz., *D. n. Tollianum*, in which the flowers always open labellum uppermost, *D. n. Cooksoni* and *D. n. Burford* var.; also specimens of the plant known in gardens as *Lælia Patinii*, but which does not appear to differ from *Cattleya Skinneri*, and a fine variety of *Lælia pumila* sometimes named "El spirito santo."

From Baron Schröder's gardens, Mr. H. Ballantine brought out spikes of the different white forms of *Lælia anceps*.

De B. Crawshay, Esq., Rosefield, Sevenoaks, exhibited a plant of *Lælia Crawshayana* ×, and also a flower of it, and for comparison one of each of *L. anceps* and *L. Gouldiana*.

E. Harvey, Esq., Riverdale, Aigburth, Liverpool, sent a fine plant with five spikes of a variety of white *Lælia* near to *L. anceps Williamsii*.

From the Duke of Sutherland's gardens at Trentham, Mr. Blair brought a well-flowered specimen of *Cattleya labiata* Trianae named *C. T. albescens*. It is the plant known in gardens as *C. T. delicata*.

T. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. Johnson), sent a plant with six spikes of a nearly white form of the fragrant *Vanda Amesiana*, with a piece of the pink-lipped form in the same pan for comparison.

Fred. G. Tautz, Esq., Goldhawk Road, Shepherd's Bush (gardener, Mr. Cowley), staged a group of Orchids in flower, comprising *Lycaste Skinneri* *Lucyana*, *L. S. Imperator*, and another form with very richly coloured flowers; *Lycaste plana* *Measuresiana*, and *Cœlogyne lentiginosa*.

N. N. Sherwood, Esq., Dunedin, Streatham Hill (gardener, Mr. Jones), sent a very large and dark form of *Lycaste Skinneri* named "rubra."

Messrs. James Veitch & Sons exhibited *Cypripedium Calypso* ×, which somewhat resembles *C. Lathamianum*; and Messrs. Pitcher & Manda, of the United States Nursery, Short Hills, New Jersey, U.S.A., exhibited under the name *Cypripedium Masereelianum* × (*C. Spicerianum* × *C. insigne Chantinii*) a plant which the Committee decided was identical with *C. Lee-anum* ×, raised in this country some years ago.

Lady Hutt, Appley Towers, Ryde, Isle of Wight (gardener, Mr. Myles), exhibited a twin-flowered spike of *Cypripedium insigne*, bearing evidence of good culture.

FRUIT COMMITTEE.

JOHN LEE, Esq., in the Chair, and twenty-two members present.

Awards Recommended:—

Cultural Commendation.

To His Grace the Duke of Devonshire, Chatsworth (gardener, Mr. O. Thomas), for a fine specimen plant of the Papaw (*Carica Papaya*), bearing a quantity of ripe fruit.

Votes of Thanks.

To A. P. Vivian, Esq. (gardener, Mr. A. Morris), for a fine fruit of Charlotte Rothschild Pine Apple.

To W. Roupell, Esq., for a collection of twenty varieties of Apples grown on Paradise stocks—in excellent condition.

Other Exhibits.

A. H. Smee, Esq. (gardener, Mr. Cummins), again sent some nice fruit of Apple Remborough.

Lady Hutt, Appley Towers, Ryde (gardener, Mr. Myles), sent examples of Grape Appley Towers, and two seedling varieties. Of the latter, No. 1 resembled Appley Towers, but the Committee was unable to arrive at any decision respecting it until its characteristics were more fully developed. The other seedling—marked No. 2—was a cross between Gros Colmar and Alicante. To this similar remarks apply. The Committee desired to see both these seedlings again.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent some fine Mushrooms, and Mr. A. Dean, Bedfont, some excellent specimens of home-grown and imported Spanish Onions. From the Society's Gardens at Chiswick came examples of six varieties of Broccoli—amongst which the Early Penzance, from Messrs. Veitch & Sons and Messrs. Rutley & Silverlock, was considered the best.

SCIENTIFIC COMMITTEE.

D. MORRIS, Esq., F.L.S. (Treas. R.H.S.), in the Chair, and nine members present.

Seakale Roots.—Professor Ward reported that the specimens submitted to him at the last meeting were affected with the slime-fungus (*Plasmodiophora*), a fungus which does great damage to the roots of Cruciferous plants.

Canker in Apple Trees.—The same gentleman reported on the specimens referred to him at the last meeting, but which presented no unusual features.

Acari on Sugar-cane.—Mr. Michael reported on mites affecting Sugar-canes in Barbados. Contrary to anticipation, the acaroids belong to the family Oribatidæ, and either to the genus *Notaspis* or to *Damæus*, having the appearance of the former, while the internal anatomy is more like that of the latter genus. The species is allied to the English *N. lucorum*, but is probably undescribed. The creatures in question are strictly vegetable feeders, but have not hitherto been considered as inflicting any material damage to living flowering plants, being found more particularly on moss and lichens. Mr. Michael recommended that specimens of the infected cane, slightly moistened, with the living *Notaspis* on them, should be put into a tin box, sealed down to prevent drying, and thus forwarded in a suitable condition for further examination; other *Acari*, of the genus *Tarsonymus*, and of extremely minute size, are known to be injurious to Sugar-cane. The species of *Damæus* are found under the bark of trees. Judging from analogy only, the mites in question would not seem likely to do much injury to living canes.

Dactylopius (Mealy-bug).—Referring to a communication made to the Committee on December 10, Mr. Morris now read a

letter from Professor Riley on the use of resin washes for bark-lice. "If," says Mr. Riley, "the insect is a *Dactylopius*, the Alexandrians cannot do better than use one of the resin washes with which we are spraying *Icerya* so successfully in California." The following extract from *Insect Life* contains a good formula for the purpose:—

"*Resin Wash for Red Scale*.—In accordance with instructions, Mr. Coquillet has been making experiments with this wash against red-scale (*Aspidiotus aurantii*), and after twenty different tests made with various preparations, from July 17 to August 8, the one which gave the best results was found to be composed of resin, 20 lb.; caustic soda (70 per cent. strength), 6 lb.; fish oil, 3 lb.; and water to make 100 gallons. In preparing this wash the necessary materials were placed in a boiler and covered with water, and then boiled until dissolved, and stirred occasionally during the boiling. After dissolving, the preparation was boiled briskly for about an hour, a small quantity of cold water being added whenever there was danger of boiling over. The boiler was then filled up with cold water, which mixed perfectly well when added slowly and frequently stirred. It was then transferred to a strong tank and diluted with water to 100 gallons. Neither the leaves nor the fruit was injured, while a large proportion of the scales were destroyed. Those which escaped were either on the fruit or the underside of the leaves. The cost of the wash is 80 cents per 100 gallons, or four-fifths of a cent per gallon. An Orange-tree, 16 feet tall by 14 feet in diameter, was given 14 gallons. This, however, seems to us to be an unnecessarily large amount, but upon this basis the cost of spraying per tree is 11·2 cents."—From "*Insect Life*," Oct. 1889, p. 92, U.S. Department of Agriculture.

The Winter Moth.—Mr. Wilson called attention to a communication in the *Hereford Times* of November 9, 1889, as to the efficacy of greased bands as a check to the insect, and wherein Mr. Cranston says:—"I consider that the greasing process which is being adopted is injurious to the bark of the trees, especially to young trees. To the older trees it may possibly not do much harm, but I believe the old plan of painting the trunks of the trees with a solution of quicklime is the best. Some use soot with the lime, but I don't know that the soot is of much consequence except to dull the white glare of the lime. The painting should be done in the autumn."

Mr. McLachlan pointed out that the proposed trap to be affixed to the lamp-posts, in the case of suburban fruit plantations, would be practically useless, as only the male insects would be thus captured, the females being nearly destitute of wings, and incapable of flight. All attempts at stamping out the winter moth should be directed to the destruction of the females, which are capable of depositing eggs for many generations in succession without the intervention of the male. The capture of myriads of males would not have the slightest appreciable effect on the fertility of the untrapped females.

Monstrous Cypripediums.—Dr. Masters showed drawings of two *Cypripedia*, in one of which the three sepals were separate, as in most Orchids, whilst in the others there was an adhesion between the median sepal, the lateral petal on the left side, and the lateral sepal on the same side, the adhesion of these parts being accompanied by corresponding adhesion of the labellum to the right lateral petal. The median stigma, G, 1, of the Darwinian notation, was also petaloid.

Keteleeria Davidiana.—Dr. Masters showed a cone sent by Dr. Henry to Kew, from Ichang, which has special interest as being intermediate in character between the Spruces (*Picea*) and the Silver Firs (*Abies*). It is congeneric with *Keteleeria Fortunei*, a tree introduced to this country from China, but which is too tender for general cultivation.

ANNUAL GENERAL MEETING.

FEBRUARY 11, 1890.

Sir TREVOR LAWRENCE, Bart., M.P. (President R.H.S.),
in the Chair.

The minutes of the last Annual Meeting of February 12, 1889, were read and signed.

The following ladies and gentlemen were elected:—

Fellows, 51.—F. B. Armitage, Robert N. G. Baker, William Balchin, Thomas Bate, Thomas Bate, the Countess of Bective, Samuel Bennett, Arthur Harper Bond, J. H. W. Bishop, Rev. Canon Bliss, Francis Augustine Browne, Jas. Brown, Miss

Georgina Carter, Miss E. M. Chute, R. S. Collier, Alex. Crossman, C. W. Dalbiac, W. W. Duffield, Rev. Whitwell Elwin, Mrs. Fleming, W. Garton, Alf. H. Griffiths, J. C. Grinling, Major Jekyll, W. Hibberdine, Mrs. Hallowell, Mrs. Henry T. Lambert, Miss Marie Low, Jas. Manson, J.P., Capt. Stephen W. Marten, R. W. T. Morris, Lady Musgrave, Alex. Overend, Edward H. Oxenham, Fred. C. Pawle, Jonathan W. Pimblett, Joseph Prestwick, W. Ransom, Mrs. W. Rivington, Geo. Henry Sage, Henry Edmund Simonds, Henry Sowter, Rev. Jas. Tillard, H. W. Underhill, Mrs. Wakefield, Alfred Warner, J. W. Wellington, Rev. Alfred Wilson, E. R. Wigram, John Wood, Percy T. Wrigley.

Messrs. H. Williams and A. J. Veitch were appointed Scrutineers of the Ballot.

A hearty vote of thanks was unanimously accorded to the retiring members of the Council, viz.: Mr. J. R. Bourne, Mr. W. Coleman, and Mr. A. H. Smee.

The balloting for members to fill the vacancies on the Council was then proceeded with, the following gentlemen having been proposed for election, viz.: Mr. E. A. Hambro, Mr. N. N. Sherwood, and Mr. Martin R. Smith.

The following gentlemen were proposed for re-election as officers, viz.: *President*, Sir Trevor Lawrence, Bart., M.P. *Treasurer*, D. Morris, M.A., F.L.S. *Secretary*, Rev. W. Wilks, M.A. *Auditors*, Geo. Deal, W. Richards, and Harry Turner.

After careful examination of the ballot papers, the Scrutineers declared the above-named gentlemen to be all duly elected.

The CHAIRMAN, in moving the adoption of the Annual Report, reviewed with satisfaction the work of the Society during the year 1889, and directed the attention of the meeting to the schedule of arrangements for 1890, in which they would find a programme of equal interest and extent with that of the past year, which had been so successfully carried out. A scheme was now under consideration for establishing the Society in a permanent home, but this he would leave Baron Schröder to explain. In conclusion, the Chairman referred to the loss sustained by the Society in the deaths of Prof. Reichenbach, Rev. M. J. Berkeley, Hon. and Rev. J. T. Boscawen, and Mr. W. Wildsmith, whose places it would be very difficult to fill.

Baron SCHRÖDER, in unfolding a scheme for establishing the

R.H.S. in a permanent home, deprecated the idea of its staying much longer in its present quarters. He proposed that they should obtain a suitable site in a central position, and for this purpose a sum of £30,000 to £40,000 would be needed. The greater part of this money would be invested in first-class securities bearing a fair rate of interest, and the remainder devoted to erecting suitable buildings for the accommodation of the Royal Horticultural Society. The interests on the investments and the rent paid by the Society for the use of the building would cover the annual ground-rent. The whole control of the money would be vested in trustees to be hereafter appointed, of whom he himself was willing to be one. He was further prepared to advance a large sum of money, and to endeavour to induce his friends to do likewise. Baron Schröder's remarks were received with great cordiality, and before the meeting closed nearly £3,000 was promised towards the fund.

Dr. HOGG, in seconding the motion for the adoption of the Report, said he had listened with pleasure to the statement made by Baron Schröder, and thought that once more the scale of fortune was turning in favour of the Society.

Several other gentlemen also spoke in support of the scheme.

Mr. MORRIS, in response to an inquiry from Mr. Frank R. Parker, explained that the Library belonged partly to the Lindley Trustees and partly to the Royal Horticultural Society, but, for convenience in working, the whole control of it was in the hands of the Trustees. The expenditure shown in the Report was on account of the Society's portion of the Library.

Several suggestions respecting the affiliation of local societies were made, and the Chairman stated that the matter was engaging the attention of the Council.

The Report was then unanimously adopted.

A hearty vote of thanks was accorded to the Hon. Secretary and Treasurer for their labours during the past year.

A vote of thanks to the Chairman for presiding concluded the proceedings.

REPORT OF THE COUNCIL FOR THE YEAR 1889.

The work of the Royal Horticultural Society cannot be said to have stood still during the year 1889. Three most useful Con-

ferences have taken place at Chiswick—viz.: on Roses, on July 2nd and 3rd; on Vegetables, on September 24th, 25th, and 26th; and on Chrysanthemums, on November 5th and 6th; and the excellent results thus obtained, together with the most valuable statistics and returns sent in by the kindness of correspondents all over the United Kingdom, with a few from foreign horticulturists, will, as recorded in the Society's *Journal*, form an authoritative standard of reference on the subjects concerned for some years to come.

Sixteen Fruit and Floral Meetings have been held in the Drill Hall, every one of which has been productive of good results to one or other of the different branches of practical horticulture. The number of awards has been as follows: On the recommendation of the Floral Committee, 54 First Class Certificates, 84 Awards of Merit, 4 Botanical Certificates, 3 Commendations. On the recommendation of the Fruit and Vegetable Committee, 7 First Class Certificates, 3 Awards of Merit. On the recommendation of the Orchid Committee, 27 First Class Certificates, 7 Awards of Merit, and 12 Botanical Certificates.

The Society's great Show, held (by the renewed kindness of the Treasurer and Benchers) in the Inner Temple Gardens, was even more magnificent than in the preceding year, the collection of Orchids, in particular, having probably surpassed any collection ever before gathered into one place. The best thanks of the Society are due to all those (and especially to the amateurs) who so generously lent their plants for exhibition.

Nor has the Scientific Committee been idle, and the notes of their meetings, as given in the Society's *Journal*, will be found full of interesting and valuable information to all horticulturists.

Meantime, the Society's general work of scientific experiment and investigation, and of the practical trial of various plants, has been going on steadily at Chiswick, under the superintendence of Mr. Barron. Trial has been made of 104 varieties of Potatoes; 50 vars. of Broccoli; 108 vars. of Vegetable Marrows, Pumpkins, and Gourds; 30 vars. of Onions; 30 vars. of Brussels Sprouts; and 41 vars. of Peas. Amongst Flowers, trial has been made of 270 varieties of Garden Annuals, 66 vars. of China Asters, 20 vars. of Stocks, 190 vars. of Dahlias, besides Zonal and other Pelargoniums; Lemoine's New Hybrid Gladioli, Pentstemons, Heliotropes, Iris, &c. Ivies, of which the Society

possesses a very fine collection, have been specially examined and classified. Reports on these trials will appear in the *Journal*. Of Chrysanthemums, 800 varieties were grown, and these not only added very materially to the display at the Chrysanthemum Centenary Conference, but, from not being so severely disbudded as is usually the case in producing the show blooms, the plants themselves, as well as the blossoms, were greatly admired. A large sum of money has this year been spent on the Gardens. Extensive repairs have been done to the glasshouses, and the general keeping up of the Gardens greatly improved. The breaking down of two of the largest boilers threatened a great addition to outlay, but the liberal gift from Messrs. Foster and Pearson of one of their patent Chilwell boilers greatly reduced the expenditure under this head. A new hybrid Tomato, considered to be one of the best in cultivation, has been raised by Mr. Barron, and the seed distributed amongst the Fellows. The experiment of opening the Gardens on Sundays has not met with such success as the Council had hoped, but they have decided to continue it—at least for the present year; and then, if the privilege should not prove to be more highly valued, it may have to be abandoned, as, besides the additional work thrown on the officers on their one rest-day in the week, it also entails considerable expense on the Society. The meetings held at Chiswick during the year, though successful in all else, have not been quite so successful in point of numbers as the Council had hoped; and they venture to think that in the year now commencing those Fellows who were so strongly in favour of meetings at Chiswick should make it their business by every means in their power, privately or through the press, to increase the numbers attending.

But perhaps the chief event of the year has been the revival of the Society's *Journal*, by means of which Fellows at a distance are enabled to enter more fully into and reap the benefits of the study and work of those more actively engaged at the centre. Four volumes, containing about 750 pages, have been issued during the twelvemonth, and the Council have the gratification of knowing, from numerous letters received, that these volumes have been highly appreciated, not only in this country, but by correspondents all over the world.*

* A few remaining copies of Vol. xi., Parts i., ii., and iii., may now be purchased at half-price—*i.e.*, Part i., 6*d.*; Part ii., 2*s.* 6*d.*; Part iii., 2*s.* 6*d.*

The invaluable work of 376 pages, on "British Apples," which Mr. Barron was able to produce as the outcome of the "Apple Conference, 1888," is now being re-issued by the Society in a cheap and popular edition, at the price of eighteenpence only. It may be as well to point out that, unless this issue should command a very large circulation, it will entail a gross loss to the Society; but the Council have felt, in face of the wide-spreading interest taken in British fruit-culture, and of the fact that this book is a standard work upon Apples, that it was their duty to encounter this risk, hoping that individual Fellows would endeavour to promote its sale amongst their neighbours and friends.

All these Conferences and Meetings, and especially the work and maintenance of the Chiswick Gardens and the publication of the *Journal*, have involved the Society in a very large outlay, and the Council take this opportunity of endeavouring to impress upon Fellows the absolute necessity there is for them all individually (as many as have the Society's welfare at heart) to endeavour to secure new Fellows to the Society if its work is not only to be continued at its present standard, but still more so if the ever-opening and extending opportunities of usefulness are to be embraced and accepted. The adoption of £1. 1s. as one rate of subscription was, no doubt, a popular movement, but the Council desire to remind the Fellows that such a low rate of Fellowship can only be self-supporting if it draws into the Society a very large number (far larger than at present exists) as additional Fellows. The Council therefore venture to express the hope that every Fellow of the Society will make an endeavour to obtain at least one new Fellow during this present year. A statement of the privileges of Fellows and of the aims and objects of the Society, together with a form of nomination to Fellowship, is for this purpose enclosed with this Report.

The revival of Lectures at the Afternoon Meetings has been another good feature in the year's work, and the Council hope that as the fact of these lectures and their value become more generally known, through their publication in the *Journal*, that the attendance of Fellows to hear them, and to take part in the discussions, will gradually increase. The Council cannot but think that many of the Fellows are unaware of the immense

interest and value of these regular bi-monthly meetings and the lectures so kindly delivered thereat; and they beg to express in their own name, and in that of all Fellows of the Society, their very best thanks to all those gentlemen who have so kindly contributed, either by the exhibition of plants, fruits, flowers, or vegetables, or by the reading of papers, to the success of these meetings.

The papers read at these bi-monthly meetings, all of which have been published in the *Journal*, are as follows:—

- March 12. "On Saxifrages," by Mr. J. G. Baker, F.R.S., F.L.S.; "Culture of Saxifrages," by Mr. George Paul; "Saxifrages," by Mr. Reuthe.
- March 26. "Dutch Hyacinths," by Heer A. E. Barnaart; "Culture of Hyacinths," by Heer J. H. Kersten; "Hyacinths in England," by Mr. James Douglas.
- April 9. "The Narcissus," by Mr. F. W. Burbidge, M.A., F.L.S., M.R.I.A.; "Seedling Daffodils," by Rev. G. H. Engleheart, M.A.; "Portuguese Narcissi," by Mr. A. W. Tait, F.L.S.
- April 23. "The Auricula," by Rev. F. D. Horner, M.A.
- May 14. "On Irises," by Professor Michael Foster, Sec. R.S.
- June 11. "Orchid Culture," by Mr. H. J. Veitch, F.L.S.
- June 25. "The Strawberry," by Mr. A. F. Barron; "Strawberry Culture for Market," by Mr. G. Bunyard.
- July 2. "Roses," by the Very Rev. the Dean of Rochester, D.D.; "Pruning Roses," by the Rev. A. Foster-Melliar, M.A.; "Groups of Roses," by Mr. William Paul, F.L.S.; "Stocks for Roses," by Mr. E. Mawley, Sec. N.R.S.; "Roses since 1860," by Mr. George Paul; "Decorative Roses," by Mr. T. W. Girdlestone, M.A., F.L.S.; "On *Rosa polyantha* as a Stock," by Mons. Viviand-Morel.
- July 3. "The Botany of Roses," by Mr. J. G. Baker, F.R.S., F.L.S.; "Rose Hybridisation," by the Right Hon. Lord Penzance; "A New Classification of Roses," by Professor F. Crépin.
- July 23. "The Florist's Carnation," by Mr. Shirley Hibberd.
- August 13. "Peaches and Nectarines," by Mr. Francis Rivers.

September 25. "On Vegetables," by Mr. H. J. Veitch, F.L.S.;
 "On Asparagus," by Mr. Shirley Hibberd; "Winter Salads,"
 by Mr. Norman.

September 26. "The Food of Vegetables," by Mr. J. Wright;
 "Peas since 1860," by Mr. T. Laxton; "Potatoes since
 1860," by Mr. A. Dean; "How to have Vegetables all
 through the Year," by Mr. J. Smith.

October 8. "On Conifers," by Mr. W. Coleman.

October 22. "Pears," by Mr. W. Wildsmith.

November 5. "Chrysanthemums," by Mr. T. B. Haywood;
 "Chrysanthemum History," by Mr. C. Harman Payne;
 "New Chrysanthemums," by Mr. E. Molyneux; "Judging
 Chrysanthemums," by Mr. J. Wright; "Progress in
 Chrysanthemums," by Mr. Shirley Hibberd.

November 6. "Botany of the Chrysanthemum," by Mr. Botting
 Hemsley, F.R.S.; "Chrysanthemum Seed and Seedlings,"
 by Mr. F. W. Burbidge, F.L.S.; "Dwarfing Chrysanthe-
 mums," by Mr. C. Orchard; "Market Chrysanthemums,"
 by Mr. C. Pearson; "Early Chrysanthemums," by Mr. W.
 Piercy.

The hearty thanks of the Society are due to the Chiswick Board and to all the members of the Standing Committees—viz. the Scientific, the Fruit and Vegetable, the Floral, the Orchid, and the Narcissus Committees—for the most kind and patient attention which they have severally given to their departments; to the exhibitors and members of the Special Committees also, who have contributed to so great an extent to produce the magnificent results of the Rose, Vegetable, and Chrysanthemum Conferences. And herein the Council cannot refrain from thanking especially the Very Rev. the Dean of Rochester, Mr. Harry J. Veitch, Mr. Shirley Hibberd, Mr. Molyneux, and Mr. Mawley, together with all the officers of the National Rose Society, who so cordially, and with such kindly feeling, co-operated in the Society's labours.

In conjunction with the Lindley Library Trustees, the Society's Library has received considerable attention. Several defective series (notably the *Botanical Magazine*, now complete from its commencement) have been made good up to date, and a large number of untidy but valuable volumes have been bound.

The best thanks of the Society are due to all those who, either

at home or abroad, have so kindly and liberally presented books to the Library or plants or seeds to the Gardens. Special thanks are due to those gentlemen who have so kindly contributed Carnations, in view of the Conference in July. A list of the donors has been prepared, and will appear in the next number of the *Journal*.

The Council recognise as fully as anyone can the great desirability of securing more suitable premises than the present Drill Hall affords, and they are now anxiously engaged in considering a scheme for erecting a suitable building on the Thames Embankment, which, if ever accomplished, would, they hope, not only afford ample facilities for our own Society, but also, in time, form a centre for all kindred Horticultural Associations. But they must remind Fellows that the adoption of this scheme is purely a matter of funds, and would entail a very large outlay, and until they can see their way to provide this, they fear that no better place than the Drill Hall can, under the circumstances, be readily found.

The Council have the sad duty of recording the death of forty of the Fellows of the Society during the past year. Amongst them they regret to find the names, Reichenbach, Boscawen, and Berkeley.

Besides the losses from death, the Council deeply grieve to have to record the loss of thirty-nine Fellows by resignation. The Society has been struggling bravely for the last two years in the face of many adverse circumstances, and with the burden, financially speaking, of a large number of Life Fellows—from whom it derives no income whatever—bequeathed to it by a former generation; and the Council had hoped that, with the evidence which even this Report gives of renewed life and vigour and usefulness, the Society would have retained the goodwill and support, and for a time the forbearance, of all who had joined it. They have, however, the pleasure of adding that a greater number have joined the Society than have left it. Still, as they said in another paragraph, they wish to impress very strongly the fact that the Society needs a large augmentation before it will be financially possible to embrace the many opportunities of usefulness opening before it. The following tabular statement will show the relations of increase and decrease during the year, both in the number of Fellows and the income arising therefrom:—

DEATHS IN 1889.

			£	s.	d.
Life Fellows ...	22	.....	0	0	0
4 Guineas	3	.....	12	12	0
2 „	9	.....	18	18	0
1 „	9	.....	9	9	0
	43		£40	19	0

RESIGNATIONS IN 1889.

			£	s.	d.
4 Guineas	4	.....	16	16	0
2 „	22	.....	46	4	0
1 „	23	.....	24	3	0
	49		£87	3	0
TOTAL	92		£128	2	0

FELLOWS ELECTED IN 1889.

			£	s.	d.
2 Guineas.....	61	.....	128	2	0
1 „	202	.....	212	2	0
Associates ...	2	.....	1	1	0

New Fellows	265	£341	5	0
Deduct.....		128	2	0

TOTAL INCREASE IN	}	£213	3	0
INCOME				

265 New Fellows
92 to deduct.

TOTAL INCREASE	}	173
IN NUMBERS		

To ESTABLISHMENT EXPENSES—						£	s.	d.	£	s.	d.
Salaries and Wages	...	...	...	...	...	347	19	8			
Rent of Offices	...	...	...	...	...	120	0	0			
Printing and Stationery	...	...	...	...	...	99	13	1			
Publications—Journal, &c.	...	...	...	...	...	498	17	8			
Postage	...	...	...	...	...	142	3	0			
Coal, Gas, and Water	...	...	...	...	...	11	1	3			
Miscellaneous	...	...	...	...	...	47	14	11			
Furniture and Fittings	...	...	...	...	...	16	17	0			
Library—Books and Binding	...	...	...	...	...	22	5	6			
									1,306	12	1
„ CHISWICK GARDEN EXPENSES—											
Rent, Rates, Taxes, and Insurance	...	...	...	...	...	278	9	10			
Superintendent's Salary	...	...	...	...	...	225	0	0			
Labour	...	...	...	...	...	722	14	2			
Implements, Soil, and Manure	...	...	...	...	...	122	19	7			
Coal and Coke	...	...	...	...	...	243	16	8			
Repairs	...	...	...	...	...	148	9	11			
Water and Gas	...	...	...	...	...	25	2	7			
Miscellaneous	...	...	...	...	...	77	19	0			
									1,844	11	9
„ SHOWS, MEETINGS and CONFERENCES—											
Rent of Drill Hall and Cleaning	...	...	...	...	...	94	9	0			
Show at Inner Temple Gardens	...	...	...	...	...	431	13	10			
Advertising	...	...	...	...	...	57	11	9			
Prizes and Medals	...	...	...	...	...	18	1	4			
Floral Meetings and Conferences—Printing, &c.	...	...	...	...	...	80	0	8			
Floral Meetings and Conferences—Labour	...	...	...	...	...	55	15	1			
Superintendent of Flower Shows	...	...	...	...	...	50	0	0			
Grants in Aid	...	...	...	...	...	20	0	0			
Miscellaneous	...	...	...	...	...	2	8	11			
									810	0	7
„ DONATIONS, &c.—											
Amount transferred	...	...	...	...	...				13	2	6
									£3,974	6	11

YEAR ending 31st DECEMBER, 1889.

Cr.

	£	s.	d.	£	s.	d.
By ANNUAL SUBSCRIPTIONS ... ..	...	...	...	2,136	19	0
„ SHOW AT INNER TEMPLE GARDENS ... ..	...	...	...	408	15	6
„ MEETINGS AND CONFERENCES ... ..	...	...	...	29	5	6
„ ADVERTISEMENTS IN JOURNAL, &c. ... ..	...	...	...	122	5	6
„ MISCELLANEOUS ... ..	...	...	...	28	3	6
„ DIVIDENDS—DAVIS BEQUEST AND PARRY LEGACY ...	...	...	...	59	10	0
„ CHISWICK GARDENS—						
Produce Sold	678	2	8			
Admission and Members' Tickets	15	16	9			
Miscellaneous	8	10	0			
Chiswick Horticultural Society—	£	s.	d.			
Balance of 1888	3	10	0			
Subscription	40	0	0			
	43	10	0			
Less Expenses	10	3	7			
				33	6	5
					735	15 1
					3,520	14 10
„ BALANCE TO GENERAL REVENUE ACCOUNT ... ..	...	...	...	453	12	1

£3,974 6 11

We have examined the above Accounts with the Books and Vouchers,
and find the same correct.

GEORGE DEAL
HARRY TURNER } *Auditors.*
HENRY WILLIAMS }

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and sixteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. C. Lee & Son, Royal Vineyard Nursery, Hammer-smith, for an effectively arranged group of Hardy Evergreen Shrubs, consisting of *Retinosporas*, *Aucuba viridis* (well berried), *Yucca plicata*, *Euonymus* in variety, *Osmanthus ilicifolius* and its varieties, *Ivies*, *Phillyreas*, &c.

Bronze Banksian Medal.

To the St. George's Nursery Company, Hanwell, for a well-flowered and brightly coloured group of *Cyclamens*.

Award of Merit.

To *Helleborus colchicus*, var. *coccineus* (votes, unanimous), from Messrs. Paul & Son, Old Nurseries, Cheshunt; flowers of a deep purple-rose colour.

Other Exhibits.

Messrs. Paul & Son sent a pretty group of Hardy Plants in flower, consisting of *Hepaticas* in variety, *Bulbocodium ruthenicum*, *Iris Rosenbachia* and *Iris carnea*, *Anemone apennina* var. *blanda*, and *Helleborus* (in variety).

Mrs. Whitbourn, Great Gearies, Ilford (gardener, Mr. J. Douglas), sent flowers of a *Helleborus* raised from a dark form of *H. guttatus*.

The Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach), sent flowers of *Violets Marie Louise*, *Swanley White*, and *De Parme*; also flowers of a brightly coloured strain of *Cinerarias*.

Messrs. James Veitch & Sons, Royal Exotic Nurseries, Chelsea, sent cut flowers of *Greenhouse Rhododendrons* of the group *multicolor*. The Committee expressed a wish to see plants in flower.

Messrs. Barr & Son, Covent Garden, sent several early-flowering *Daffodils*, such as the pretty yellow *Narcissus cyclamineus*, *N. minimus*, *Corbularia monophylla*, &c. *Chionodoxa sardensis* was shown in fine condition; also *Anemone fulgens*.

Messrs. H. Cannell & Sons, Swanley, sent a good *Primula*

under the name of Cannell's Pink ; also *Cineraria* blooms of fine form and colour.

Mr. J. James, Woodside Nursery, Farnham Royal, sent *Primula* Woodside Giant ; flowers pure white, with a greenish-yellow eye.

Sir George Macleay, Pendell Court, Bletchingley (gardener, Mr. F. Ross), sent flowers of *Astrapæa Wallichii* and *Akebia quinata*.

ORCHID COMMITTEE.

H. J. VEITCH, Esq., F.L.S., in the Chair, and sixteen members present.

Awards Recommended :—

First Class Certificate.

To *Cypripedium Lathamianum* ×, a variety raised at the Birmingham Botanic Gardens, and since in other gardens, by crossing *C. Spicerianum* and *C. villosum*. The finest plant was exhibited by Baron Schröder (gardener, Mr. Ballantine), but C. L. Ingram, Esq., Elstead House, Godalming (gardener, Mr. Bond), F. G. Tautz, Esq. (gardener, Mr. Cowley), and Messrs. Jas. Veitch & Sons also exhibited the same variety, and participated in the award, which was passed unanimously.

To *Cypripedium cardinale* × (votes, 6 for, 5 against), Vanner's variety, a form of *C. cardinale* ×, formerly raised by Messrs. Veitch & Sons. The plant certificated was raised by W. Vanner, Esq., Camden Wood, Chislehurst.

To *Cypripedium Elliottianum* (votes, unanimous), from H. M. Pollett, Esq., Fernside, Bickley (gardener, Mr. Parks).

To *Cypripedium Germinyanum* × (votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea, and H. M. Pollett, Esq. This variety has the general appearance of the fine old *C. hirsutissimum*, but with larger flowers.

To *Cypripedium porphyrochlamis* × (votes, unanimous) (*C. barbatum Crossii* ×, *C. hirsutissimum*), from F. G. Tautz, Esq.

To *Odontoglossum ramosissimum* (votes, 15 for), from A. H. Smee, Esq. (gardener, Mr. Cummins). This is an old species, but seeing the beauty of its pure white flowers spotted with crimson, the Committee deemed it desirable to distinguish it.

Botanical Certificate.

To *Masdevallia leontoglossa* (votes, 15 for), from A. H. Smee, Esq. (gardener, Mr. Cummins).

Award of Merit.

To *Lycaste Skinneri Regina* (votes, 10 for, 2 against), from E. A. Roberts, Esq., Woodlands House, Greenhithe (gardener, Mr. J. Simon).

Other Exhibits.

Messrs. J. Veitch & Sons staged the fine hybrid *Cypripedium Germinyanum* × (*C. villosum* and *C. hirsutissimum*), *C. Calypso* ×, a new ally to *C. Lathamianum* ×; *Phalænopsis* “F. L. Ames” ×, and *Dendrobium Wardiano-japonicum* ×, a neat variety, with white flowers with dark red blotch on the lip.

H. M. Pollett, Esq. (gardener, Mr. Parks), sent a fine *Odontoglossum crispum Bickleyense*, with yellowish ground colour to the flowers, spotted with brown; also a distinct form of *Cattleya Trianæ*, in which the front lobe of the lip was coloured with a decidedly blue tinge over the crimson body colour.

F. G. Arbuthnot, Esq., Bridgen Place, Bexley, sent two handsome *Odontoglossums* and two white forms of *Cattleya labiata Trianæ* for the Committee to name. The names affixed were *Odontoglossum Andersonianum*, *O. Wilckeanum*, *Cattleya Trianæ virginalis*, and for the other *Cattleya*, which was of fine shape and substance, the Committee confirmed the Bridgen Place name, *C. Trianæ Helleniana*.

Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr. Cullimore), had a group of Orchids comprising *Cattleya amethystoglossa*, with twenty-four flowers on a spike, *Odontoglossum Humeanum*, *O. Oerstedii*, *O. blandum*, *Ansellia lutea*, *Dendrobiums*, and *Lælia albida* var.

W. Vanner, Esq., exhibited some good varieties of *Cattleya Trianæ*, and a fine plant of *Lycaste Skinneri alba*, *Dendrobium nobile Cooksoni*, and *Odontoglossums*.

A. H. Smee, Esq., The Grange, Hackbridge (gardener, Mr. Cummins), contributed *C. Trianæ Dayana*, from the collection of the late Mr. John Day. It has flowers of good size and fine colour.

A. S. Smith, Esq., Silvermere, Cobham (gardener, Mr. J. Quarterman), sent a noble plant of the old *Cypripedium insigne*, with eighty-seven flowers.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent *Cœlogyne cristata*, and specimens of the same plant were forwarded by Mr. Waltham, Streatham Hill, and Mr. O. Thomas, Chatsworth Gardens.

Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White), sent his hybrid *Dendrobium Aurora* ×, a variety with the general appearance of *D. nobile*, but with broader segments.

H. Druce, Esq., The Beeches, Circus Road, St. John's Wood (gardener, Mr. Walker), forwarded, under the name *Dendrobium Waltoni*, a variety which the Committee determined was identical with *D. Wardiano-crassinode*, a natural hybrid previously certificated from Baron Schröder's gardens.

F. G. Tautz, Esq., with the other *Cypripediums* previously mentioned, sent C. "Mrs. Canham."

Flowers sent to Name or for Remark.

C. Wood, Esq., Weybridge, for name—*Oncidium serratum*.

Major Mason, The Firs, Warwick, sent a flower of one of the darkest and richest coloured *Lycaste Skinneri* which have yet appeared.

The Rev. T. M. B. Paterson (gardener, Mr. H. Reynard), flowers of *Cœlogyne cristata* and *C. c. alba* (?), both decided to be ordinary *C. cristata*, and two forms of *Lælia albida* flowering on the same mass—a not uncommon occurrence, as seedlings are imported growing together.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and twenty members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, The Nurseries, Crawley, for a collection of forty-five varieties of Apples, in excellent condition, the most noticeable varieties being Annie Elizabeth, Mère de Ménage, Golden Reinette, Court Pendu Plat, Brabant Bellefleur, Cox's Orange (well coloured), Sturmer Pippin, and Wellington.

Cultural Commendation.

To the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach), for good examples of Tomato, Ham Green Favourite, from seed sown in September.

Other Exhibit.

The Duke of Northumberland (gardener, Mr. Leach) sent some fine specimens of Coldstream Leeks.

Mr. Arthur Sutton proposed a vote of condolence to Mrs. Wildsmith on the death of her husband—the late Mr. W. Wildsmith—a valued member of the Committee. This was seconded by Mr. Hudson, supported by Mr. Bunyard, and carried unanimously.

SCIENTIFIC COMMITTEE.

W. T. THISELTON DYER, Esq., F.R.S., C.M.G., in the Chair, and eleven members present.

Mealy-bug at Alexandria.—Mr. Morris supplemented the information already given by him respecting this new Egyptian pest, by reading a letter from Mr. J. W. Douglas, to whom the specimens had been sent, stating that the coccids had proved to be not only a new species but a new genus. It was proposed to describe them under the name of *Crossosoma ægyptiacum*.

Growth on Stem of Cattleya.—Mr. McLachlan reported on a peculiar growth on the stem of a *Cattleya* from Brazil. This was at first supposed to be of the nature of a cocoon, but a careful examination of the structure had shown it to be a gall. Professor Marshall Ward undertook to make further examination.

Sugar-cane Borer at St. Vincent.—Mr. McLachlan drew attention to a disease in Sugar-cane at St. Vincent, where in some localities about 25 per cent. of the crop would be lost this year. According to Mr. Herbert Smith, who had examined the canes, a beetle of the family Scolytidæ, and the larva of a moth, were concerned. It is probable that the beetles only enter the canes by the exit holes of the moths. The moth is probably a widely spread species, already known to attack Sugar-cane in other countries. The affected canes should be burned, and steps taken to destroy the moth in the localities specially frequented by it.

Disease of Orchids.—Mr. Morris exhibited several specimens of a *Cattleya* attacked by a fungoid disease of apparently a very virulent character. From a specimen received about a fortnight ago, Mr. Masee had infected at Kew two or three healthy plants, and in three days the whole of the pseudo-bulbs had become diseased. Specimens of similarly affected plants were sent by Mr. James Douglas, from a gardener who was anxious to know if there was any remedy, as he feared his collection was in danger of being destroyed. The Committee was of opinion

that the disease, whatever the cause, was of a very virulent character. It was not the ordinary "spot" so well known to Orchid-growers. The specimens were referred to Professor Marshall Ward, who had already given some attention to the subject.

Orchid Hybrids.—Mr. H. J. Veitch exhibited *Cypripedium Lathamianum* ×, raised first at the Birmingham Botanic Gardens, by crossing *C. Spicerianum* ♂ with *C. villosum* ♀. Messrs. Veitch had raised similar hybrids, and had, moreover, raised hybrids from the reversed cross. Plants from all three sources were shown. These agreed so closely in all essential points that they must bear the same name. The fact of plants obtained by crossing, and also by reverse crossing, producing seedlings of almost exactly the same character, is very interesting. Similar results have been obtained by Messrs. Veitch in crossings which have produced *Cypripedium Sedenii* ×, and *Fuchsia Dominiana* ×.

Mr. H. J. Veitch also exhibited a new hybrid *Dendrobium*. The seed-bearing parent was *D. japonicum*, and the pollen parent *D. Wardianum*. The hybrid *D. Wardiano-japonicum* had smaller pseudo-bulbs than *D. Wardianum*, but the flowers were nearly those of *D. japonicum*, but larger and with broader segments. They were also highly scented, as in *D. japonicum*.

Canker in Apple Trees.—Professor Marshall Ward brought before the Committee specimens of Apple-trees badly affected with the so-called canker, on which there were numerous red perithecia of a *Nectria*. It is probable that the initial injury in this case had been caused by frost, and that the *Nectria* had established itself in the cracks thus formed.

Picea nobilis.—Mr. James Douglas forwarded branches of *Picea nobilis* affected by gouty swellings, due probably to the attacks of an *Acarus* (*Phytoptus*), or to *Æcidium elatinum*. Professor Marshall Ward kindly undertook to examine the specimens.

London Fogs.—Dr. Oliver and Professor Scott presented an interim report on the investigations undertaken by them respecting the effects of London fogs on plants under glass. Specimens of Orchids affected by fog had been received from Messrs. Veitch & Sons, Chelsea; and of Tomato plants from the superintendent of the Royal Horticultural Society's gardens at Chiswick. On

the suggestion of the chairman, it was decided to take up an investigation of the chemical constituents of London fog, and trace the exciting causes of the injury to plants. The question was a very important one, and likely to demand considerable time and attention. In order to carry out the work under advantageous circumstances, it was resolved to make application to the Government Grant Committee of the Royal Society for pecuniary aid.

GENERAL MEETING.

MARCH 11, 1890.

The Rev. W. WILKS, M.A. (Secretary R.H.S.), in the Chair.

ELECTIONS.

Fellows, 39.—W. G. Baker, Rev. Thos. Bates, F. Bridges, Thomas Burton, A. R. Minard-Cammell, Thomas Christopher, jun., Joseph Cobb, George Colville, Alistair Clark, Mrs. John Clerk, James Crute, Hon. Henry W. Fitzwilliam, Henry Fordham, Herbert C. W. Greaves, A. C. Harcourt, John Hart, H. P. Harris, Sydney Flower Jackson, Edward Harris Jones, T. Wickham Jones, John A. Laing, James H. Laing, Rev. Fred. Fox Lambert, H. Vesey Machin, J.P., Oswald Chas. Marston, R. A. H. Mitchell, George Monro, Mrs. Newton, Miss Nisbet, E. T. Partridge, H. G. Quilter, J. Roberts, Miss Frances F. L. Schreiber, Rev. John Sinclair, James Gray Smeaton, Edward Waltham, Mrs. H. Ward, Frederick Watson, and William Weale.

Papers were read:—"On Hippeastrums (*Amaryllis*)," by Mr. Harry J. Veitch, F.L.S.; and "On Hybrid Hippeastrums (*Amaryllis*)," by Mr. James Douglas, F.R.H.S.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and eighteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Mr. H. B. May, Dyson's Lane Nurseries, Upper Edmon-
ton, for a well-arranged group of small Foliage Plants suitable

for table decoration, consisting of *Dracænas*, *Crotons*, *Aralias*, and *Ferns*, surrounded by *Isolepis gracilis*.

To Messrs. William Paul & Son, Paul's Nurseries, Waltham Cross, for a dozen boxes of *Camellias*, good and well-known varieties, some of the most noteworthy sorts being *alba plena*, *C. M. Hovey*, *Cup of Beauty*, *fimbriata*, *Mathottiana*, &c.

Bronze Banksian Medal.

To Messrs. Barr & Son, King Street, Covent Garden, for a showy exhibit of *Daffodils* (cut blooms) in numerous varieties, associated with *Anemone fulgens*, *Chionodoxas*, *Scillas*, and *Crocus*.

First Class Certificate.

To *Hippeastrum* (*Amaryllis*) *Champion* (votes, unanimous), from Messrs. J. Veitch & Sons, Royal Exotic Nursery, Chelsea. A noble flower between 10 and 11 inches in diameter, the largest yet obtained. Colour, rich deep scarlet.

To *Phoenix Roebelinii* (votes, unanimous), from Messrs. F. Sander & Co., The Nurseries, St. Albans, and Mr. J. O'Brien, Harrow-on-the-Hill. A miniature *Date Palm* of graceful habit, likely to be very useful for decorative purposes.

To *Camellia La Vestale* (votes, unanimous), from Mr. C. Turner, Royal Nursery, Slough. Flowers pure white, and of fine shape.

Award of Merit.

To "strain" of *Cinerarias* (votes, unanimous), from Messrs. H. Cannell & Sons, The Nurseries, Swanley. Flowers well formed, colours pleasing and diversified.

Other Exhibits.

From the Royal Gardens, Kew, were sent a number of rare and interesting plants, comprising *Strelitzia Nicolai*, white and purple flowers; *Tacca artocarpifolia*, bearing a cluster of flowers and long drooping filaments, somewhat similar to the better known *Attacia cristata*; a plant in flower of *Buphane toxicaria* (the *Poison Bulb*); *Godwinia gigas*, large deep purple spathe; *Arisæma speciosum*; *Æchmea glomerata*, bracts scarlet tipped with purple; rhizomes of *Arrowroot plant* (*Maranta arundinacea*). Several *Rhododendrons* were also shown, including *R. arboreum*, *R. a. roseum*, *R. grande* (*argenteum*), and *Acacia retinodes*, bearing sweetly scented flowers.

Mr. H. Porter, nurseryman, &c., Freshfield, Liverpool, sent *Adiantum Porteri*, the result of a cross between *A. cuneatum* and *A. gracillimum*.

Mr. J. T. Gilbert, nurseryman, Bourne, Lincolnshire, sent a seedling Primrose named *Ye Primrose Dame*, and cut flowers of *Anemones*, &c.

Messrs. James Veitch & Sons sent an excellent group of *Hippeastrum* (*Amaryllis*), showing the gradual advance made in this family of plants since *A. Ackermanni pulcherrima* appeared. This later variety, with *crocia grandiflora*, *Johnsoni*, *Graveana*, and others of the earlier kinds, were shown.

An interesting group of plants from the same firm comprised *Azalea mollis* (varieties), *Andromeda japonica*, *Boronia megastigma*, and *B. heterophylla*.

Mr. Moore, Holmwood, Kingston-on-Thames, sent a well-bloomed plant of *Primula obconica*.

Messrs. Paul & Son, Old Nurseries, Cheshunt, sent a box of fresh and beautiful Tea and H. P. Roses, and a pyramidal plant of *Rosa polyantha grandiflora*.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and eleven members present.

Awards:—

Silver Banksian Medal.

To Messrs. F. Sander & Co., St. Albans, for a group of Orchids in which there were some fine specimens of different varieties of *Dendrobium nobile*, a large and well-flowered specimen of *D. Wardianum*; two plants, each with several spikes, of *Phajus tuberosus*; *Maxillaria Hubschii*, *M. tabularis*; *Oncidium cruciatum*, *O. heteranthum*, a species of the same section as *O. abortivum*; *Dendrobium lituiflorum superbum*, *Ipsa speciosa*, *Cypripedium Schomburgkianum*, and a new and very pretty yellow *Lycaste*, which the Committee requested should be referred to the Kew herbarium.

To Messrs. B. S. Williams & Son, Victoria and Paradise Nurseries, Upper Holloway, for a group of Orchids arranged with Ferns and Palms. The prominent feature in this group was the many species and varieties of the favourite genus *Odontoglossum*,

several forms of *O. crispum*, *O. Pescatorei*, and *O. luteo-purpureum* being present, as well as the white-lipped variety of *O. Hallii*, *O. facetum*, which may be referred to *O. luteo-purpureum*, *O. cirrosum*, and *O. Sanderianum*. In Messrs. Williams's group also were fine specimens of *Platyclinis* (*Dendrochilum*) *glumacea*, *Lycaste fulvescens*, *Epidendrum lanipes*, and *Calanthe Williamsii*, the latter the richest coloured variety of the *C. Regnieri* section yet seen.

First Class Certificate.

To *Dendrobium signatum* (votes, 5 for, 4 against), from Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White). This Dendrobe is of a distinct type, with growths similar to those of *D. nobile*, and clear yellow wax-like flowers with reddish brown marks at the base of the labellum.

To *Phajus Cooksonii* × (votes, unanimous), exhibited by the raiser, Norman C. Cookson, Esq., Wylam-on-Tyne. This was the result of crossing *P. Wallichii* with *P. tuberosus*; the seedlings which resulted, and which flowered in the third year, being evidently intermediate between the parents. The large crimped labellum of *P. Cooksonii* is yellow at the base, then rose, changing to a darker and duller tint towards the edge. In form the lip is more tubular than that of *P. tuberosus*.

To *Lycaste Skinneri*, Young's variety (votes, unanimous), from Reginald Young, Esq., Fringilla, Linnet Lane, Sefton Park, Liverpool (gardener, Mr. Poyntz). This variety is the counterpart of the best form of *L. S. alba*, but the labellum has over it a shade of pinkish orange or apricot colour, and the petals the same hue more faintly displayed. It is a very charming and unique variety.

To *Dendrobium Aspasia* × (*D. aureum* and *D. Wardianum*) (votes, unanimous), from Messrs. James Veitch & Sons. A variety with handsome white flowers tipped with pink, and with orange base to the labellum marked with crimson.

To *Cypripedium Numa* × (*C. Stonei* and *C. Lawrenceanum*) (votes, 7 for, 3 against), from Messrs. James Veitch & Sons. The flowers are much like those of *C. Rothschildianum*, but the leaves have narrow green veining as in *C. Harrisianum* ×.

Botanical Certificate.

To *Cypripedium Schomburgkianum* (3 for, the others not voting), from Messrs. F. Sander & Co. This species is similar to *C. caricinum* (*C. Pearcei*).

To *Angræcum*, new variety (votes, unanimous), from Messrs. Hugh Low & Co., Clapton. Evidently a natural hybrid between *A. citratum* and *A. hyaloides*, sprays of which were exhibited with it. (On reference to Kew this was named *A. primulinum*.)

To *Dendrobium Smillii* (votes, unanimous), from Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White). This is a singular species, with white flowers tinged with pink and tipped with green.

Award of Merit.

To *Oncidium Larkinianum* (votes, unanimous), from J. Larkin, Esq., Perriville, Highbury New Park (gardener, Mr. Rann). The flowers were of the form of those of *O. Gardnerianum*, but with clear yellow lip as in *O. Marshallianum* or *O. varicosum*.

To *Odontoglossum Pescatorei melanocentrum* (votes, unanimous), from Fred. G. Tautz, Esq., Studley House, Goldhawk Road, W. (gardener, Mr. Cowley). This unique variety has clear white flowers with purple crest on the labellum, and without yellow at the base of the lip, as in the type.

To *Cattleya Trianæ marginata* (votes, 9 for, 1 against), from Messrs. John Laing & Son. This variety is fine in colour, and the lip has a clear white or lavender margin.

To *Cattleya Trianæ fulgens* (votes, unanimous), from H. B. Mildmay, Esq. The large labellum of this form is of a glowing crimson colour.

To *Cœlogyne cristata* varieties (votes, unanimous), from Messrs. Paul & Son, Cheshunt, who staged a small group of all the best large-flowered forms.

Other Exhibits.

Messrs. James Veitch & Sons exhibited their new hybrid *Cypripedium Othello* × (*C. hirsutissimum* × *C. Boxalli*); the fine *Cymbidium eburneo-Lowianum* × and *Dendrobium micans* ×, both of which had previously received First Class Certificates; also *D. Wardiano-japonicum* ×.

G. Appleyard, Esq., Saville House, Saville Road, Halifax, sent a pretty *Odontoglossum hebraicum*, near to the variety known as *lineoligerum*.

H. Mark, Esq., Cheriton, Albemarle Road, Beckenham, exhibited a finely flowered *Oncidium tetracopis*.

George Firth, Esq., Manningham Thorp, Bradford (gardener, Mr. Collier), sent a richly coloured *Cattleya Trianæ* in the way of *C. T. Backhousiana* or *C. T. Normani*.

C. Ingram, Esq., Elstead, Godalming (gardener, Mr. Bond), exhibited a specimen with several flowers of the richly coloured but rather small-flowered *C. Trianæ* Louis Ingram.

F. G. Tautz, Esq., showed *Cypripedium selligerum rubrum*.

CUT FLOWERS.

From Major Mason, The Firs, Warwick, came a flower of a form of *Cattleya Trianæ*, with the edges or marginal halves of the petals flaked with crimson. The whole of the flowers on the plant were stated to be similarly marked. Also to name, *Oncidium* (*Cyrtochilum*) *maculatum*.

Mr. C. Wythes brought from the Duke of Northumberland's gardens flowers of *Cypripedium villosum*, and a fine spray of *Cœlogyne cristata*, like *C. c. Lemoniana*, but with orange spot at the base of the lip. It is locally known as the Syon variety, but its generally accepted name is *C. c. intermedia*.

Mr. J. W. Wilson, South Cave, East Yorks, sent flowers of three good forms of *Odontoglossum Rossii* majus.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair and nineteen members present.

Awards Recommended:—

Silver Banksian Medal.

To A. H. Smee, Esq.. The Grange, Wallington, Surrey (gardener, Mr. G. W. Cummins), for a collection of admirably grown and well-kept Apples, comprising the Gooseberry Apple, grown in 1888, Claygate Pearmain, Golden Noble, Cox's Orange Pippin, Golden Reinette, and Hoary Morning.

Cultural Commendation.

To Lord Foley, Ruxley Lodge, Esher (gardener, Mr. W. Miller), for very fine examples of Mushrooms from an outdoor bed.

To A. H. Smee, Esq., for splendid dishes of Stewing Pears; the sorts shown being Catillac, Uvedale's St. Germain, Pius IX., Verulam, Winter Franc Real, and Besi Mai.

Other Exhibits.

Mr. J. Moore, Seymour Cottage, Sutton, sent fruits of a Seedling Pear from Bergamotte Crassane, of rich flavour but

over-ripe. The Committee expressed a desire to see it again, with particulars as to the habit of the tree, &c.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. W. Miller), sent a dish of Apple Claygate Pearmain.

Messrs. R. Veitch & Son, The Nurseries, Exeter, sent Apple Ashford Seedling, a favourite Devonshire market variety, about which the Committee requested to have further information.

Mr. Cecil H. Hooper, Swanley, sent a variety of small baskets for packing fruit.

SCIENTIFIC COMMITTEE.

Professor A. H. CHURCH, F.R.S., in the Chair, and eight members present.

Effects of London Fog on Plants.—Mr. Morris read the terms of an application for a sum of money from the Government grant administered by the Royal Society, to be devoted to the partial payment of the expenses connected with an inquiry into the composition of London fog, with special reference to those of its constituents that are injurious to plants.

Fruit of Loranthus.—Mr. Morris stated, on the authority of Professor Oliver, that the fruit of Loranthus attached to the panicle of the Sugar-cane, exhibited at a previous meeting, was *L. americanus*.

Sugar-cane Borer.—Mr. Blandford reported that the moth mentioned at the last meeting, as injuring Sugar-canes in St. Vincent, was *Diatræa saccharalis*. The beetle alluded to on the same occasion is known as *Xyleborus perforans*, and was originally described by Wollaston in his *Catalogue of the Coleoptera of Madeira*, p. 96. It occasions great injury to the bungs of the wine-casks in Madeira. Wollaston found it commonly feeding in the stems of *Jatropha curcas*.

Seedlings of Sugar-cane.—Mr. Morris, in continuation of information placed before the Committee on December 10, exhibited specimens of mature seeds of the common Sugar-cane (*Saccharum officinarum*). There were also shown germinating seeds, some plants, drawings of the flower, and dissections of the fruit (caryopsis) in detail. Mr. Morris stated that there appeared to be no authentic record of any really wild station for the Sugar-cane; further that the fruit of the Sugar-cane was not known

before, and had not hitherto been figured or described. At Barbados several times during the last twenty years, and more recently by Professor Harrison and Mr. Bovell, self-sown seedlings of the Sugar-cane had been observed. The subject was taken up systematically in 1888, and about sixty of the seedlings had been raised to mature canes. Many of these exhibited well-marked characteristics, differing from the varieties growing near them. Careful inquiry had shown that canes known as the "Purple Transparent" and "White Transparent," and possibly also the "Bourbon" cane, produced seeds in very moderate quantities. Spikelets received at Kew had been examined and the seed found *in situ*. A description with figures had recently been laid before the Linnean Society by Mr. Morris. It is anticipated that by cross-fertilisation, and a careful selection of seedlings, it will now be possible to raise new and improved varieties of Sugar-cane, and renew the constitutional vigour of plants that have become deteriorated through continuous cultivation by cutting or slips. Great importance is attached to the subject in Sugar-producing countries, as it opens up an entirely new field of investigation in regard to Sugar-cane cultivation.

GENERAL MEETING.

MARCH 25, 1890.

Dr. ROBERT HOGG, F.L.S., in the Chair.

ELECTIONS.

Fellows, 24.—Sir Alex. John Arbutnot, K.C.S.I., A. Arthur, R. J. Ashton, Hon. Judge Bacon, Hilton C. Barker, Robert Beldam, Henry Daniel, F. T. Edridge, Charles French, Rev. John Green, William Hooper, J. Dunnington Jefferson, Charles Jordan, F. Mackett, A. Matthew, Alex. Miller, Mrs. Caroline Miller, Henry Miller, R. Harris Percy, William Russell, Thomas William Sanders, John F. Seaton, Sir Thomas Wade, and Rev. Alfred Wilson.

A paper was read: "On Saladings," by M. Henry de Vilmorin, F.R.H.S. (Paris).

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and eighteen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. B. S. Williams & Son, The Nurseries, Upper Holloway, for an extensive group of plants in flower, consisting of Clivias, Lilacs, Hyacinths, Lily-of-the-Valley, Boronias, and Epiphyllums.

Silver Banksian Medal.

To Messrs. J. James & Son, Woodside Nursery, Farnham Royal, Slough, for a very brightly coloured group of Cinerarias, showing a good strain of these useful decorative flowers.

To Messrs. Paul & Son, Old Nurseries, Cheshunt, for a beautiful group of Roses in pots, the more noteworthy varieties being Lady Alice, Jean Ducher, Madame Hoste, Souvenir de S. A. Prince, Madame Lacharme, and Mignonette.

Bronze Banksian Medal.

To Messrs. Barr & Son, Covent Garden, for a group of Daffodils, Sir Watkin, Princeps, Golden Spur, and Horsfieldii being the most prominent varieties.

To Messrs. W. Cutbush & Son, The Nurseries, Highgate, for a pretty group of Epacris in flower, containing most of the best old varieties.

To Messrs. H. Cannell & Sons, The Nurseries, Swanley, for very fine trusses of Zonal Pelargoniums and double-flowered Cinerarias.

Awards of Merit.

To *Philadelphus inodorus* (votes, unanimous), from the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach). Flowers large pure white, freely produced. The plant forces well.

To *Deutzia candidissima flore pleno* (votes, unanimous), from the Duke of Northumberland (gardener, Mr. Leach). A useful forcing shrub, bearing very pretty double snow-white flowers in long racemes.

To *Iris Sindjarensis* (votes, unanimous), from Messrs. Barr & Son. A dwarf and very distinct species, with pale lavender-blue flowers.

To *Trillium discolor atratum* (votes, 11 for, 4 against), from Messrs. James Veitch & Sons, Chelsea. A variety bearing very dark purple flowers, and with leaves prettily spotted.

To *Lily-of-the-Valley*, Fortin's var. (votes, 10 for, 7 against), from Mr. E. Morse, The Nursery, Epsom. Plant of strong habit of growth, and bearing bells of extra size.

Other Exhibits.

Mr. R. Dean, Ranelagh Road, Ealing, sent some well-flowered Primroses and Polyanthuses showing a wide range of colour.

From the Royal Gardens, Kew, was sent an interesting group of plants, containing *Cœlogyne pandurata* [see Report of the Orchid Committee, p. xxxviii]. Also a group of hardy spring flowers, comprising *Triteleia uniflora*, *Saxifrages* and *Primulas* in variety, *Hyacinthus ciliaris*, *Iris persica purpurea*, *Draba Mawii*, and several *Sisyrinchiums*.

Mr. C. Turner, Royal Nursery, Slough, sent some beautiful blooms of Tree Carnations.

J. W. Ford, Esq., Enfield (gardener, Mr. T. H. Froud), sent cut blooms of well-known varieties of Camellias.

Messrs. James Veitch & Sons sent several new Hyacinths, *Admiration*—a pink flower—being considered the best.

ORCHID COMMITTEE.

Sir TREVOR LAWRENCE, Bart, M.P. (President R.H.S.), in the Chair, and fifteen members present.

Awards Recommended:—

First Class Certificate.

To *Dendrobium Wardianum*, Schröder's variety, exhibited by Baron Schröder, The Dell, Staines (gardener, Mr. Ballantine). This is the richest coloured form of *D. Wardianum*, and quite unique. Its labellum and petals are more heavily marked with purplish crimson than in the ordinary form, but the chief difference results from the sepals being crimson over the greater part of their surface on the reverse side, the colour showing

through from the back to the front of the petals, whose margin is ivory white. It bears much the same relation to *D. Wardianum* that *D. nobile nobilium* does to *D. nobile*.

To *Lælio-Cattleya Hippolyta* ×, from Messrs. James Veitch & Sons. A garden hybrid raised at the Royal Exotic Nursery, King's Road, Chelsea, by crossing *Lælia cinnabarina* with pollen of *Cattleya labiata* Mossiæ. The plant exhibited had a flower about five inches across, in form like a small narrow-lipped *C. Mossiæ*, and in colour of an exquisite tint of Indian yellow; the nervures of the flower and the edge of the labellum being slightly darker than the body colour.

Award of Merit.

To *Cattleya Trianæ Tautziana*, from F. G. Tautz, Esq., Studley House, Goldhawk Road, W. (gardener, Mr. Cowley). This was a very distinct and highly coloured form, of medium size. The petals were almost as broad as long; the labellum rich yellow at the base, and of the fine velvety crimson colour seen more frequently in *C. Warszewiczii* (*C. gigas*) than in the varieties of *C. Trianæ*, on the front lobe, which is evenly and prettily crimped and frilled.

Cultural Commendation.

To G. F. Darnell, Esq., Devonshire House, Stamford Hill (gardener, Mr. G. Elliott), for *Angræcum citratum giganteum*, a well-grown example of the best variety of this graceful Orchid, with four spikes.

To A. H. Smee, Esq., The Grange, Hackbridge (gardener, Mr. G. W. Cummins), for *Cyrtopodium Saintlegerianum*, Reich. Two finely flowered specimens of this handsome plant (which, however, cannot be considered specifically distinct from *C. punctatum*) were staged; the long green and brown bracts which hung from the bases of the branches of the inflorescence lending an additional attraction to the numerous yellow and brown flowers.

To W. C. Walter, Esq., Percy Lodge, Winchmore Hill (gardener, Mr. G. Cragg), for *Oncidium sarcodes*. The plant, which was a very strong one, had two branched spikes, each about four feet in length.

All the above awards were by unanimous vote.

Other Exhibits.

From Baron Schröder's gardens Mr. Ballantine brought *Cattleya* [Trainæ] Schröderæ alba, which the Committee requested should be forwarded again; also the fine and distinct *Odontoglossum Leeae* which was awarded a First Class Certificate in 1882.

F. G. Tautz, Esq., staged a small group, comprising *Dendrobium chrysodiscus* ×, *Odontoglossum nævium majus*, *O. blandum* with two spikes, *Lycaste cruenta*, and some *Dendrobies*.

From the Royal Gardens, Kew, came a fine specimen of *Cœlogyne pandurata*, which reflected great credit on the cultivation of this difficult plant at that establishment; it had a fine spike of its large emerald-green flowers, the labellums being marked on the prominent parts of the centre and base with black.

Messrs. F. Sander & Co., St. Albans, staged a group of Orchids in which were good specimens of *Oncidium bifolium majus* with ten spikes, *Dendrobium nobile nobilius*, *Oncidium tetrapetalum*, two showy varieties of *Cattleya Trianae*, a pan of *Miltonia vexillaria*, a fine *Cœlogyne* nearly related to *C. Cummingii*, and the pretty *Angræcum Germinyanum*, which was referred to the Scientific Committee.

Norman C. Cookson, Esq., Wylam-on-Tyne, again exhibited his hybrid *Phajus Cooksoni* certificated at the last meeting. Reginald Young, Esq., Fringilla, Linnet Lane, Sefton Park, Liverpool (gardener, Mr. Poyntz), sent a supposed hybrid *Cypripedium*—named *C. hybridum Poyntzianum*—of no great beauty. It was similar in flower to that known as *C. Bullenianum*, but it had a *C. javanicum* leaf. J. Charlton Parr, Esq., Grappenhall Heyes, Warrington (gardener, Mr. C. J. Catt), forwarded a fine spike of the major form of *Angræcum sesquipedale* with three flowers. Messrs. Pitcher & Manda, The United States Nurseries, Hextable, Kent, staged several *Cypripediums*, including *C. chlorops* ×, a *C. caricinum* cross nearly related to *C. Dominicanum* ×; also a form of *C. Trianae* with brightly coloured flowers. Messrs. Hugh Low & Co., Clapton, sent *Phalænopsis Schilleriano-gloriosa*, a form with sepals and petals like *P. Schilleriana*, but with the sepals marked like *P. Stuartiana*; the labellum has the cirrhæ at the apex as in *P. gloriosa*, and not the blunt horns of *P. Schilleriana*. E. Ellis,

Esq., The Manor House, Wallington (gardener, Mr. T. A. Glover), exhibited Ellis's variety of *Odontoglossum Andersonianum* with a fine spike of richly spotted flowers, also cut flowers of *Lycaste Schilleriana* and *Dendrobium nobile*; and H. F. Nalder, Esq., Mornington Lodge, West Kensington (gardener, Mr. T. W. Rogers), a good plant of the same species of *Dendrobium*.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and twenty-two members present.

Awards Recommended :—

Award of Merit.

To Apple Amorel (votes, unanimous), from G. B. Eyre, Esq., Welford Park, Newbury (gardener, Mr. C. Ross). A pretty little flat russety variety, of unknown parentage; good quality.

Cultural Commendation.

To W. Eastwood, Esq., Kingswood, Englefield Green (gardener, Mr. Simms), for very fine well-grown fruits of Strawberry La Grosse Sucrée.

Other Exhibits.

Mr. T. Lockie, Oakley Court, Windsor, sent fine examples of Cucumber Lockie's Perfection—a short-necked, handsome variety.

Earl Rosebery, Mentmore, Leighton Buzzard (gardener, Mr. J. Smith), also sent a brace of fine Cucumbers.

Messrs. H. Lane & Son, The Nurseries, Great Berkhamstead, sent examples of three varieties of Water Cress, showing slight variations of colour, form of leaf, &c. Messrs. Lane stated that these variations were quite constant, and that they did not all succeed equally well in the same parts of the stream.

The Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach), sent some fine well-blanchéd heads of Veitch's Standard Bearer Celery.

Messrs. Webber & Co., Covent Garden, sent a fine series of Salads, mostly imported.

Messrs. Rutley & Silverlock, Savoy Street, Strand, sent examples of an Onion stated to be the true James's Keeping.

The Committee considered that it more closely resembled the Brown Globe.

Mr. W. Roupell, Harvey Lodge, Roupell Park, S.W., sent some remarkably fine and well-kept examples of Apples, grown in the London district. The varieties Annie Elizabeth and Striped Beefing were remarkably fresh and good. Melon and Bismarck were somewhat past.

Mr. Lewis, South Leasons, Malvern, sent a Seedling Apple, recommended as a good late culinary variety.

Mr. J. Lye, Market Lavington, Wilts, sent a Seedling Apple, as also Ashford Seedling, similar to specimens received at the previous meeting from Messrs. Veitch, of Exeter.

SCIENTIFIC COMMITTEE.

D. MORRIS, Esq., F.L.S. (Treasurer R.H.S.), in the Chair, and six members present.

Dr. Masters introduced M. Henry de Vilmorin, ex-President of the Botanical Society of France, who was invited to take part in the proceedings of the Committee.

Figs.—Branches were exhibited covered with a brown scale, which the sender said had proved very injurious. The remedy suggested was to scrub the branches with a hard brush and soap-suds. The specimens were further referred to Mr. MacLachlan for examination and report. Other branches of Fig in a dying condition were apparently free from parasites, and their condition betokened some mischief at the root.

Iris Sindjarensis.—A plant of this was exhibited by Messrs. Barr & Son, and received a botanical certificate. M. de Vilmorin pointed out its resemblance in foliage to *Iris orchidacea*.

St. Helena Ebony.—Mr. Morris alluded to the peculiar vegetation of St. Helena, now confined, for the most part, to a small area in the central and higher part of the island. Many of the trees formerly native to the island are now all but, or quite, extinct. Among them is a species of *Trochetia*, or *Melhania*. The trunks of this tree are embedded in the cliffs of the island, and are dug out by the inhabitants for the sake of manufacturing ornaments. The following quotation from Melliss's exhaustive

work on St. Helena refers to this plant:—"The native Ebony of St. Helena.—This plant I believe to be now extinct. It formerly grew on the outer portions of the island, near the coast, at mid-altitudes, where the weather-beaten stems are still found deeply embedded in the surface-soil. The last plant I saw was a small one growing in the garden at Oakbank about twenty-five years ago, but it is not there now, and I have searched the whole island over for another, but in vain. The leaves were dark green, and the flowers white; the wood is very hard, heavy, black in colour, and extremely brittle. It is still collected and turned into ornaments, which are much prized on account of its rarity. That this tree once formed a considerable portion of the vegetation clothing the island on those parts that are now quite barren is strongly evidenced by the many references to it in the local records. It is the *Dombeya erythroxyton* of Andr. Bot. Repos., vi., t. 389, not of Willdenow."

It is interesting to know that the plant is still in existence under cultivation at Kew (and perhaps elsewhere) under the name of *Melhania* (*Dombeya*) *erythroxyton*. At the present time the plant, which was obtained from the gardens at Herrhausen, is in flower at Kew.

Mr. MacLachlan called attention to the interesting remark on the rare plants of St. Helena contained in Mr. Wollaston's book on the Coleoptera of the Atlantic islands.

Fingered Citrons.—Dr. Masters showed a drawing of a fruit that had ripened in the garden of Mr. Hanbury, at La Mortola, near Ventimiglia, and made some comments on the peculiarities of its structure. M. de Vilmorin said that similar malformations occurred in other Oranges, especially in the Bitter Orange, the flowers of which were used in perfumery, and in which the carpels might be seen occasionally in all stages of dissociation.

Sport of Narcissus.—From Mr. Walker came one bulb producing two distinct flowers—viz., Silver Phœnix and *N. incomparabilis* fl.-pl. The specimen was referred to Dr. Masters for further examination.

Florida Pine.—From Mr. Divers came a cone of *Pinus cubensis* (Elliotti), and one of *P. inops*, var. *clausa*, just brought home from Florida. Mr. Morris spoke of the wood of the Cuban

Pine in British Honduras as being very hard, and said that many colonies were now importing soft wood, not that their own forests were destroyed, but because the timber yielded by them was too hard to be used profitably. M. de Vilmorin pointed out the difference between the typical *Pinus inops* and the specimen exhibited.

GENERAL MEETING.

APRIL 8, 1890.

D. MORRIS, Esq., F.L.S. (Treasurer R.H.S.), in the Chair.

ELECTIONS.

Fellows, 13.—Lord Auckland, T. C. Barnett, Lord Alfred Churchill, G. C. Churchill, Major Thomas Brett Cowburn, Henry F. Moore, Thomas Pritchard Newman, George Smailes, G. Frederick Strawson, Alfred B. Testrail, Anthony Waterer, T. Welham, John Wood.

A paper was read :—“ On Spring Flower Gardening,” by Mr. W. Ingram, F.R.H.S., Belvoir.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and seventeen members present.

Awards Recommended :—

Silver Banksian Medal.

To Mr. W. Rumsey, The Nurseries, Waltham Cross, for a group of Roses in pots, comprising Lady Mary Fitzwilliam, Climbing Niphetos, Duke of Edinburgh, Sunset, and Souvenir de Paul Neyron.

To Mr. J. Walker, Ham Common, Surrey, for a fine collection of Daffodils. Amongst the list of varieties were Mary Anderson, C. J. Backhouse, Henry Irving, Emperor, Horsfieldii, Cernuus, Sir Watkin, and Lady Watkin.

To Messrs. Paul and Son, Old Nurseries, Cheshunt, N., for a good group of plants, consisting of *Hippeastrum* (*Amaryllis*) and Standard Azaleas, well flowered. Also noteworthy were a number of Alpine plants in pots, flowering Shrubs, Tree Pæonies, *Erythroniums*, and Tulips (in variety).

Bronze Banksian Medal.

To O. T. Hodges, Esq., Lachine, Chislehurst, for a pretty group of Alpine Primulas in flower.

Awards of Merit.

To *Pyxidantha barbulata* (votes, unanimous), from Messrs. Paul & Son. An elegant little rock-plant, bearing a profusion of white star-shaped flowers.

To Primrose Oakwood Blue (votes, unanimous), from G. F. Wilson, Esq., Heather Bank, Weybridge Heath. Colour of flowers deep indigo-blue—the best in this way yet obtained. The plant had been flowering out doors since January.

To *Polyanthus Terra-cotta* (votes, 14 for, 1 against), from Mr. R. Dean, Ranelagh Road, Ealing. Colour of flower as indicated by its name.

To *Hippeastrum* (*Amaryllis*) Grand Monarch (votes, unanimous), from Messrs. James Veitch & Sons, Chelsea. Flower of fine form, dark-red colour.

Other Exhibits.

The Misses de Rothschild, Gunnersbury House, Acton (gardener, Mr. James Hudson), sent flowering branches of *Magnolia conspicua* (very beautiful), *Habrothamnus scaber* (Newelli), and *Maranta Warscewiczii*.

From the Royal Gardens, Kew, was sent a good group of useful Greenhouse Plants in flower, such as *Eupatorium atropurpureum*, *Agapetes buxifolia*, *Mackaya bella*, *Goodia latifolia*, *Olearia stellulata*, *Bauera rubioides*, *Chorozema Soulangeana*, &c.

Mr. R. Dean, Ealing, sent a number of Primroses—the variety White Cloud being very distinct and beautiful.

Mr. W. Rumsey sent excellent blooms of Roses *Innocente Pirola* and *Niphetos*.

The Rev. W. Wilks, Shirley Vicarage, Croydon, sent *Cytisus atropurpureus*.

Messrs. Barr & Son, Covent Garden, sent a showy group of Daffodils in excellent variety.

O. T. Hodges, Esq., Lachine, Chislehurst, sent some well-flowered plants of *Lachenalia Nelsoni*.

ORCHID COMMITTEE.

Dr. MAXWELL T. MASTERS in the Chair, and thirteen members present.

Awards Recommended :—

Bronze Banksian Medal.

To the Duke of Sutherland, Trentham Hall, Stoke-on-Trent (gardener, Mr. P. Blair), for a group of Orchids comprising *Cattleya Trianae* "Trentham variety," a form with richly coloured purplish crimson labellum; *Odontoglossum Ruckerianum* variety with heavily blotched flowers of good size; *O. crispum flaveolum* with clear yellow flowers; *Dendrobium nobile nobilium*, *D. n. Cooksonii*, *D. chrysodiscus* ×, and a large variety of *Odontoglossum triumphans*.

To F. Wigan, Esq., Clare Lawn, East Sheen (gardener, Mr. W. H. Young), for a group of Orchids whose chief feature was two well-grown specimens of the large and fragrant *Cattleya labiata Schröderæ*, the one with twelve and the other with seven flowers. This species was named *C. Trianae Schröderæ* by Professor Reichenbach, but in odour and other respects it is more distinct from *C. Trianae* than *C. labiata Mendeli* is; its proper designation therefore should be *C. labiata Schröderæ*. Mr. Young also staged a fine *Aëranthes (Angræcum) Leonis*, *Cypripedium Swanianum* ×, *C. hirsutissimum*, and a small plant of *Bifrenaria Harrisoniæ*.

Cultural Commendation.

To F. Wigan, Esq., Clare Lawn, East Sheen (gardener, Mr. Young), for *Aëranthes Leonis*.

To E. Ellis, Esq., Manor House, Wallington (gardener, Mr. J. A. Glover), for a fine specimen of *Aërides suavissimum* with four spikes of flowers.

Other Exhibits.

The Rev. E. Handley, Royal Crescent, Bath (gardener, Mr. Kerslake), exhibited a good specimen of *Angræcum sesquipedale* with nine flowers; also a superb variety of *Odontoglossum crispum* and a highly coloured form of *O. maculatum*.

F. G. Tautz, Esq., Studley House, Goldhawk Road, W. (gardener, Mr. Cowley), staged a brilliantly coloured *Cattleya Lawrenceana*, a fine specimen of *Cypripedium selligerum majus* ×, and *Miltonia vexillaria*, with white edges to the segments and white rays on the labellum.

Messrs. J. Laing & Son, Forest Hill, sent a pigmy form of *Cypripedium niveum*; Messrs. James Veitch & Sons, Chelsea, a distinct new *Dendrobium* from New Guinea. Its growths are similar to those of *D. macrophyllum* (Veitchianum), and the flowers approach that species in form; they are yellowish, two inches across, the sepals and petals spotted with violet, and the lip striped with the same colour. Mrs. Brightwen, The Grove, Stanmore (gardener, Mr. J. W. Odell), exhibited for the first time the pretty little white *Disa sagittalis* with six spikes.

Cut spikes of a spotted form of *Odontoglossum Pescatorei* were sent by T. H. Powell, Esq., Drinkstone Park, Bury St. Edmunds (gardener, Mr. George Palmer). The sprays bore evidence of good culture, and, although both cut from the same plant, exhibited some little difference in the spotting of the flowers. Drewett O. Drewett, Esq., Riding Mill on Tyne, sent flowers of his hybrid *Cypripedium delicatulum* ×, a hybrid between *C. barbatum Warnerii* and *C. Dayanum*, and also an inflorescence of a variety of *Dendrobium thyrsoiflorum* with unusually white sepals and petals.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and twelve members present.

Award Recommended:—

Award of Merit.

To Strawberry Auguste Nicaise (votes, unanimous) as a good forcing variety, from Earl Rosebery, Mentmore, Leighton Buzzard (gardener, Mr. J. Smith).

Other Exhibits.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent some good Mushrooms from outdoor beds.

Earl Rosebery (gardener, Mr. J. Smith) sent fine fruits of Laxton's Noble Strawberry.

From the Society's Gardens were sent thirteen varieties of Broccoli which had been on trial, the varieties consisting of Smith's Protecting (Rutley & Silverlock), Leamington (Veitch), White Sprouting (Oakshott & Millard), Mammoth (Veitch), Purple Sprouting (R. Veitch & Son), Improved Early Purple Sprouting (J. Veitch & Sons), Sutton's Dwarf Favourite (Oakshott & Millard), Sharpe's Monarch (Sharpe & Co.), Paragon (Hooper & Co.), Knight's Protecting (Veitch), Cooling's Matchless (Veitch), Sutton's Perfection (Oakshott & Millard), Sulphur or Chappell's Cream (Veitch).

SCIENTIFIC COMMITTEE.

D. MORRIS, Esq., F.L.S. (Treasurer R.H.S.), in the Chair, and five members present.

Scale on Fig Tree.—Mr. McLachlan reported that the scale on the Fig-tree was a species new to Great Britain, and named *Mytilaspis ficus*.

Purple Primrose.—Mr. Wilson exhibited a plant of a Primrose, a seedling from Scott Wilson, showing a greater advance to a deep blue colour than has yet been made. A series of intermediate forms were also shown.

Root Galls on Poa annua.—Professor Marshall Ward showed a specimen of this grass with spiral knobs on the rootlets, due to the irritation of the cortical tissues caused by root-worms, *Heterodera rexdicicola*. Mr. Morris alluded to the recent publication of a report on this subject by the American Department of Agriculture.

"*Fingered*" *Orange*.—From Mr. Rivers, of Sawbridgeworth, came specimens of Oranges showing a partial dissociation of the carpels similar to the corresponding anomaly in the Citron, of which drawings were recently laid before the Committee.

Cytisus Adami ×.—Mr. Wilks showed a flowering root of

Cytisus purpureus which had been engrafted on a seedling *Laburnum*. Professor Marshall Ward called attention to the explanation offered by Professor Strassburger, of the occurrence of the famous *Cytisus Adami*, viz., that it was due to an accidental fusion of two nuclei, one from one species, one from the other.

Diseased Vines.—Mr. Blackmore sent a specimen with the following note:—"The specimen submitted is the entire upward growth of a young Gros Colmar planted in a vinery border, and started into growth some two months since. About three weeks ago it was suddenly struck with the fatal complaint, having, up to that time, been strong and healthy, with richly coloured foliage. I have not examined the roots, but believe that they are quite healthy, as in fifty similar cases I have always found them to be. There are no cold draughts in the house, neither has there been any sudden fall of temperature. Other vines close by are in luxuriant health and full growth." The specimen was referred to Professor Marshall Ward for examination and report.

Botanical Certificates.—Certificates were recommended on the ground of botanical interest and novelty to *Dendrobium albo-violaceum* and *Disa sagittalis*.

GENERAL MEETING.

APRIL 22, 1890.

SIR TREVOR LAWRENCE, Bart., M.P. (President R.H.S.), in the Chair.

ELECTIONS.

Fellows, 30.—W. E. H. Baker, Mrs. Ida Mabel Benyon, Mrs. E. Bodkin, John Burrell, Frank F. Butler, Rev. W. H. Churchill, Mrs. Coleman, Drewett O. Drewett, Geo. Edwards, R. F. Finnis, Mrs. Wm. Robt. Fox, J. C. Geisellbrecht, Joseph Harding, Colonel E. S. Hill, Chas. F. Howell, Geo. Bond Howes, Henry Hide, Miss Jaffray, Henry Hart Jones, Peter Kay, W. Mann, John Pope, Dr. Richard Quain, Herbert Rothera, Henry Simon, Edwin Skewis, Richard Steel, Richard Tyser, Lynch White, jun., Mrs. Wurton.

The President presented a Veitch Memorial Medal to Mr. David Thompson, gardener to the Duke of Buccleuch at Drumlanrig Castle, and to Mr. Bruce Finlay, superintendent of the Botanical Gardens, Manchester.

Papers were read:—"On Primulas," by the Rev. C. Wolley-Dod, M.A., F.R.H.S.; and "On Auriculas," by Mr. T. E. Henwood, Treasurer National Auricula and Primula Society.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and nineteen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. Ryder & Son, The Nurseries, Sale, Manchester, for a very beautiful group of *Primula Sieboldi*, in variety, the most noticeable sorts being Bruce Findlay, Distinction, Rosy Morn, Mrs. Ryder, Beauty of Sale, Nymph, and Mrs. F. S. Woodward.

Silver Banksian Medal.

To Messrs. B. S. Williams & Son, The Nurseries, Upper Holloway, for a large group of flowering plants, consisting principally of very well-grown specimens of *Clivias*, *Hippeastrum* (*Amaryllis*), and *Spiræa astilboides*.

To Mr. H. B. May, The Nurseries, Upper Edmonton, for a group of well-grown Ferns.

Bronze Banksian Medal.

To Messrs. H. Lane & Son, The Nurseries, Great Berkhamstead, for an attractive group of *Rhododendrons* and *Azaleas* in flower.

To Messrs. James Veitch & Sons, Chelsea, for a small but interesting group of plants in flower, noticeable being *Staphylea colchica*, *Azalea rosæflora*, and *Chionanthus virginica*.

Awards of Merit.

To Mignonette Garaway's Double White Improved (votes, 7 for, 2 against), from Messrs. Garaway & Co., The Nurseries, Bristol. An excellent type, producing very erect spikes of pure white flowers.

To *Nephrolepis exaltata plumosa* (votes, unanimous), from Mr. H. B. May, Upper Edmonton. A distinct variety, with heavily crested fronds.

To *Rhododendron Williamsi* (votes, unanimous), from Messrs. B. S. Williams & Son. Obtained from a cross between *Rhododendron arboreum* and *Azalea sinensis*; flowers nearly white, tinted with lilac.

To Primrose Red Gauntlet (votes, unanimous), from G. F. Wilson, Esq., F.R.S., Heather Bank, Weybridge. Flowers of rich purplish blue, having a band of red round the yellow centre.

To *Primula (amœna) Bruce Findlay* (votes, unanimous), from Messrs. Ryder & Son. Finely formed flowers of a bright blue colour.

To *Primula (amœna) Distinction* (votes, unanimous), from Messrs. Ryder & Son. Flowers deep rose, beautifully fringed.

To *Narcissus George Engleheart* (votes, 5 for, 4 against), from the Rev. G. H. Engleheart, Andover. Raised from a cross between *Narcissus Tazetta Bazelman major* and *N. poeticus ornatus*; perianth white, cup pale yellow, with bright yellow margin.

Other Exhibits.

Messrs. Paul & Son, Old Nurseries, Cheshunt, sent a beautiful group of hardy flowers, especially noticeable being the fine masses of *Doronicum plantagineum excelsum*, *Anemones* in variety, and *Iris pumila azurea*.

T. H. Burroughs, Esq., 16 Lower Berkeley Street, W., sent a charming display of cut flowers of *Anemone hortensis* (varieties).

From the Royal Gardens, Kew, was sent a very interesting group, consisting of Sikkim *Rhododendrons*, *Aristolochia Goldiana*, *Streptocarpus Dunni*, *Amherstia nobilis*, *Tropæolum azureum*, *Primulas* in variety, &c.

M. Hodgson, Esq., Shirley Cottage, Croydon, and Mr. J. Walker, The Nursery, Thame, each exhibited very fine blooms of Marechal Niel Rose.

Mr. J. T. Gilbert, The Nursery, Bourne, Lincolnshire, sent some beautifully coloured flowers of *Anemone fulgens*.

The Rev. W. Wilks, Shirley Vicarage, Croydon, sent flowers of the fine Trumpet Daffodil *Mme. de Graaff*.

Messrs. Barr & Son sent an attractive collection of Daffodils and other hardy flowers.

Mr. R. Dean, Ealing, sent a plant of Boscawen's double yellow Primrose. This the Committee desired to see again next year.

R. I. Measures, Esq., Camberwell, sent cut flowers of Pelargonium Miss F. Measures, pure white. The Committee expressed a desire to see plants in flower.

The Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), sent some well-berried Pernettyas.

Mrs. Grinling, Harrow Weald House, Stanmore (gardener, Mr. Seabright), sent a well-flowered plant of Ochna multiflora.

ORCHID COMMITTEE.

T. B. HAYWOOD, Esq., in the Chair, and fifteen members present.

Awards Recommended :—

First-class Certificate.

To *Odontoglossum triumphans aureum*, from A. H. Smee, Esq., The Grange, Wallington (gardener, Mr. Cummins). This variation from the type has pale yellow markings in place of chestnut-brown. It is the first appearance of this variation in *O. triumphans*, and it bears the same relation to that species that the yellow *O. luteo-purpureum sceptrum* known as *O. Mase-reelianum* bears to its species.

To *Cattleya Lawrenceana Vinckii*, from Baron H. Schröder, The Dell, Staines (gardener, Mr. H. Ballantine). This fine variety has the flowers tinged with pale blue or bluish slate colour. It is a very novel colour in Orchids. The plant had two spikes, one of three and the other of four flowers.

Awards of Merit.

To *Miltonia vexillaria le Doux* variety, from G. le Doux, Esq., East Moulsey, Surrey. A variety with very large flowers, the labellum white, and the sepals and petals tinged with rose colour.

To *Odontoglossum Pescatorei*, Mrs. G. W. Palmer, from G. W. Palmer, Esq., Elmhurst, Reading (gardener, Mr. B. Dockerill). The flowers were of good size, pure white, with purple spotting on the halves of the sepals and petals near the centre of the flower, the character of the marking resembling that of *O. hebraicum*.

All the above awards were by unanimous vote.

Other Exhibits.

Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr. D. Cullimore), staged a small but select group of Orchids, consisting of two very highly coloured forms of *Odontoglossum Rossii majus*, *O. nebulosum*, *O. Hallii*, *Oncidium cucullatum*, *Sophronitis grandiflora*, and *Masdevallia ignea*. Also a full-size photograph of a plant of *Cattleya guttata Prinzii* (*C. amethystoglossa*) which he had flowered with twenty-four flowers on a spike.

R. I. Measures, Esq., Cambridge Lodge, Camberwell (gardener, Mr. H. Simpkins), exhibited his new hybrid *Cypripedium Apollo* ×, the result of crossing *C. vexillarium* × with *C. Stonei*. The flowers, which were flushed with bright rose, were intermediate between the two parents, but the plant being small, the Committee requested to see it again.

A. H. Smee, Esq., exhibited a good plant of *Dendrobium thyrsoiflorum* with three spikes.

H. M. Pollett, Esq., Fernside, Bickley, sent what was said to be *Odontoglossum luteo-purpureum sceptrum*, differing from the type by having a white ground. The variety seemed to be a form of *O. Wilckeanum*.

Messrs. James Veitch & Sons, Royal Exotic Nurseries, Chelsea, sent their form of *Cattleya calummata* ×, and a new *Cypripedium* obtained between *C. Philippinense* and *C. villosum*, not yet strong enough to show its character.

Sir Trevor Lawrence, Bart., M.P., sent *Masdevallia Arminii*, *Oncidium phymatochilum*, *Dendrobium sulcatum*, and a grand cut inflorescence of *Phalænopsis grandiflora*.

F. Lee, Esq., Lyndford Hall, Mundford, sent two fine cut spikes of the rare *Cymbidium chloranthum*, with numerous pale greenish yellow flowers marked with purple on the lip.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and eighteen members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, The Nurseries, Crawley, for a collection of well-kept Apples, the most noteworthy sorts being

Cox's Orange, Curltail, Alfriston, Dutch Mignonne, Brabant Bellefleur, and Betty Geeson.

Cultural Commendation.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for very fine fruits of Strawberries President and Keen's Seedling.

Other Exhibits.

Messrs. H. Lane & Son, The Nurseries, Great Berkhamstead, sent examples of Apple Lane's Prince Albert.

Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent Mushrooms from an outdoor bed.

Mr. W. B. Hartland, nurseryman, Cork, sent Broccoli April Queen. Heads very large. The Committee expressed a desire to have it tried at Chiswick.

SCIENTIFIC COMMITTEE.

Dr. M. T. MASTERS in the Chair, and nine members present.

Hybrid Narcissi.—Rev. G. H. Engleheart exhibited a collection of hybrids, amongst which was one called George Engleheart, a cross between *N. poeticus ornatus* and *Narcissus Tazetta Bazelman major*. This was quite new, and received a botanical certificate. Another was between *N. poeticus* and a trumpet Daffodil, *Hudibras*; this had a remarkably large and flat crown. A third, between *P. poeticus ornatus* and *Mary Anderson*, had an orange-streaked cup, both parents having an orange-bordered cup; the colour had become intensified. Mr. Engleheart observed that the anthers being situated half-way between the points of the insertion of those of the two parents, was a characteristic feature of hybrids amongst *Narcissi*, and that no appreciable difference occurs in the hybrids raised when the parentage is reversed. He also remarked that Dean Herbert thought that *N. Tazetta Bazelman major* was barren with its pollen, as he could raise no plants from it. This was probably due to a too chilly climate. Mr. Henslow remarked that *N. Tazetta* is very abundant amongst the rocks in Malta, and has two forms, one with a short stout stem and many flowers, another with a long slender stem and fewer flowers.

Aristolochia Goldicana.—Mr. Morris commented upon the singular flower of this plant, which had blossomed at Kew, and now exhibited. There had been a race between the flower-bud and the shoot-bud. The former was small, and proceeded out of the old wood. The flower-bud finally prevailed, and the shoot was thereby checked. It is a West African species, differing from the South American in having twenty-four stamens, &c. It is figured and described in the *Botanical Magazine*, No. 5672.

Primrose variety.—Mr. Wilson exhibited a seedling from “Scott Wilson,” of a deep blue-purple, with a red eye.

Plant Diseases.—Rev. C. Wolley-Dod gave an interesting account of several diseases of plants in his garden, and commented on the difficulty of finding curative means, or of hearing of other suggestions than burning. He first alluded to a species of smut (*Ustilago*) on *Primula farinosa*, which appeared to be indigenous, as the plants were collected in Lancashire; and, although it was grown with *P. denticulata*, the smut was confined to the former species. *Æcidium ficariæ* had attacked his Hellebores. In this case, a drier soil was suggested as likely to prove effective in ridding the plants of the fungus. The “Lily spot,” due to *Polyactis cana*, usually appearing late in summer, had been seen in April upon Tulips, and apparently the same species on Daffodils. It was suggested that a mixture of sulphate of copper and quicklime would prove effective, as in the case of Vines, described below. *Puccinia Schrœteri* had occurred on Daffodils from Portugal, and also upon the common double sorts.

Diseased Vines, Treatment of, in France, with “Bouillie Bordelaise.”—Mr. Dod read the following communication:—“In the Médoc there are three applications of the treatment. (1) The first is towards the end of May, when the Vine has produced shoots about 30 centimètres long. At this period the flower of the Vine is not yet opened. (2) A second application is made at the end of June or the beginning of July. (3) A third about the first half of August. The first application requires about 2 hectolitres of Bouillie per hectare. The other two, 2½ to 3 hectolitres per hectare. With regard to the preparation of the Bouillie, the following is the method employed:—For 100 kilos. In one tub is put 50 kilos. of water and 3 kilos. of sulphate of copper; in

another tub 50 kilos. of water and two of lime. The sulphate of copper having been dissolved, and the lime well soaked, the two liquids are then mixed. Cold water is used and slaked lime. Formerly small brooms made of Heather or Butchers' Broom were used to sprinkle the liquid on the vines. Several varieties of syringe are now used. It was at first hoped that the Bouillie would destroy both the mildew and the Oidium. Up to the present time such has not been the case; and if the mildew is absolutely destroyed by this treatment, the use of sublimed sulphur has to be continued against the Oidium.

Sulphate of Iron as a Remedy against the Potato Disease.—Rev. G. Henslow quoted the following passage from a report by the late Professor G. Gulia, of Malta, upon the Orange disease, but bearing on the question of the destruction of vegetable parasites:—"Having watered two Aralias, three Begonias, an Orange, and several Rose bushes, with a solution of sulphate of iron, in the proportion of six grains to one litre, these plants, far from sustaining any injury, seemed to gain intensity of colour to their chlorophyll, and their buds shot with greater rapidity and luxuriance. Towards the end of the past year, Potatoes were attacked by *Phytophthora infestans*, to such an extent as to impoverish and destroy the crop of the greater number of fields, especially in the eastern districts of the island. In a small field adjacent to others infected by the fungus, the ground was sprinkled with the solution prior to the sowing of the Potatoes; some young plants sprang up, and the crop was so abundant as to astonish the cultivators of the neighbouring fields, who were seized with a longing to adopt the method in question. Not a single leaf of these plants bore the fatal fungus. This was certainly due to the sulphate of iron, which had destroyed the spores buried in the soil, and rendered the plants so vigorous as to impede the growth of the pernicious fungus."

Colours of Flowers, Experiments on.—The following communication was received from Mr. Smee: "Some years ago, when experimenting with flowers and plants placed in a weak solution of silicate of soda, I noticed that the plants and flowers were affected by the solution according to their colour. The colours disappear in the following order: blue, lilac, red, and brown, whilst yellow was the most persistent. Greens behaved according as blue or yellow predominated in its composition.

The question has occurred to me whether the white varieties of flowers are not formed among plants in a similar order. We have an example in the blanching of the old flowers of *Franciscea*. Then again in the poor varieties of *Vanda cœrulea*, the petals are almost white with very pale blue veining. In *Cattleya*, the colour of the petals and lip disappears, leaving the yellow throat and the pale pink tint (which so often spoils a white *Cattleya* from a florist's point of view), as the remains of the red tint in the mauve colour. Therefore, as yellow is so persistent, we cannot expect an albino of *C. citrina* to appear amongst our white varieties. The white *Odontoglossum crispum* is due to the disappearance of the brown blotches, leaving only the yellow markings on the column; and in the case of the yellow *O. triumphans*, which is a poor form of the ordinary type, the brown blotches are either absent or are in process of disappearance. The only pure white forms of Orchids are *Cœlogyne cristata alba*, *Dendrobium Kingianum album*, and *Saccolabium Heathii*." [*Calanthe vestita*, var. *nivalis*, is another purely white orchid, and there may be others.]

Primrose with Foliaceous Corolla.—Mr. Douglas sent a plant with the corolla foliaceous; the calyx was normal. It is a not uncommon form.

RULES FOR THE NAMING OF ORCHIDS FOR GARDEN PURPOSES.

Adopted by the Council, May 13, 1890.

SECT. I.—GENERA, SPECIES, WELL-MARKED VARIETIES, AND NATURAL HYBRIDS.

1. The names of natural genera, species, and well-marked varieties, as well as of presumed wild hybrids, shall be written so as to accord with botanical language and usage, and to conform with the laws of botanical nomenclature (*Lois de la Nomenclature Botanique*) as adopted at the International Botanical Congress at Paris in 1867.

2. Exhibitors showing, for the first time, a plant under a Latin name, shall be required to furnish the name of the botanist who has described the plant.

SECT. II.—ARTIFICIAL HYBRIDS BETWEEN GENERA.

3. Every bigener shall receive a generic name in Latin formed by combining the names of the parent genera, and a specific name also in Latin, the sign of hybridity \times being always added.

SECT. III.—ARTIFICIAL HYBRIDS BETWEEN SPECIES.

4. Hybrids between species *raised artificially* shall be named in Latin, with the addition of the word *hybridus*, or of the sign of hybridity \times . (*See par. 1.*)

SECT. IV.—ARTIFICIAL CROSSES BETWEEN VARIETIES.

5. Crosses between varieties *raised artificially* shall receive suitable vernacular names.

SECT. V.—GENERAL RECOMMENDATIONS.

6. The Orchid Committee shall decline to recognise any unauthorised name, or any name that is deemed unsuitable, or is not applied in conformity with the preceding rules.

7. A name once authoritatively adopted shall not be altered.

8. An award may be made to any plant that is considered by the Committee worthy of such distinction, even though it be unnamed, or not named in accordance with the preceding regulations, *provided that*, within a reasonable time, to be determined by the Committee, a proper name be given. Any award made under these circumstances shall be suspended until the plant has been properly named.

9. The operation of these rules to be prospective, not retrospective.

10. The Council wishes to impress upon Orchid growers the desirability of obtaining drawings or photographs of all new and certificated Orchids, and of depositing such drawings in the Library of the Society for reference.

11. The Council also desires to remind cultivators of the great importance of preserving specimens for future reference and comparison, and suggests that, wherever practicable, specimens should be sent for this purpose to the "Director of the Royal Gardens, Kew."

EXTRACTS FROM THE PROCEEDINGS
OF THE
ROYAL HORTICULTURAL SOCIETY.

GENERAL MEETING.

MAY 13, 1890.

GEO. PAUL, Esq., in the Chair.

ELECTIONS.

Fellows, 35.—W. C. Atkinson, Mrs. E. Bramah, Robert Brown, Geo. Catherell, Robt. Caught, D. Alex. Coles, Geo. Cox, Robt. Cumming, Geo. Dixon, S. W. Edelsten, P. H. Emerson, Edw. Empey, Alf. Florance, Wickham Flower, Mrs. Blackett Gill, John H. Gray, C. H. Hall, W. R. Hawson, Capt. Cecil Holder, W. Chas. Jones, Mrs. Kidston, Mrs. Louis Levy, L. Lopes, John Lynam, Albert Middleton, Mrs. E. G. Codrington Parr, Thos. Peed, Samuel Reid, A. W. Smith, A. M. Smithers, F. A. Taylor, S. Thacker, Col. Wm. Brooke, G. W. Truscott, Richard Winch.

A paper was read on "Spring-flowering Trees and Shrubs," by Mr. W. Goldring, F.R.H.S.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. Kelway & Son, The Nurseries, Langport, Somerset, for a collection of cut flowers of Tree and Herbaceous Pæonies, single-flowered Pyrethrums, masses of Lilac (*Syringa alba grandiflora*), *Eurybia Gunni*, and the pure white *Anemone sylvestris*.

Silver Banksian Medal.

To Messrs. Paul & Son, Old Nurseries, Cheshunt, for an interesting collection of cut specimens of hardy flowering trees

and shrubs, comprising several varieties of Lilacs, *Cytisus scoparius* var. *Andreanus* (certificated), double Cherry, *Cydonia japonica*, *Staphylea colehica*, &c.

Bronze Banksian Medal.

To Mr. F. Hooper, The Nurseries, Bath, and Mr. J. Forbes, The Nurseries, Hawick, N.B., for collections of Pansies (cut blooms).

To Messrs. Barr & Son, Covent Garden, for a group of Daffodils, Irises, Tulips, and other hardy flowers.

To Messrs. H. Cannell & Sons, The Nurseries, Swanley, for cut blooms of French and Zonal Pelargoniums, and baskets of Pansies arranged in distinct colours.

To Messrs. J. Veitch & Sons, Chelsea, for a group of hardy trees and shrubs: *Cydonia japonica* Moorlezi, *Enkianthus campanulatus* (both of which were certificated), *Ledum buxifolium*, *L. latifolium*, *L. palustre*, &c.

To Messrs. Ryder & Son, The Nurseries, Sale, Manchester, for a group of many varieties of *Primula Sieboldii* and Pansies, in variety.

First Class Certificate.

To *Calla Elliottiana* (votes, unanimous), from Captain Elliott, Farnborough Park, Farnborough (gardener, Mr. G. M. Knight), bearing a fine rich yellow spathe; large deep-green leaves, spotted with white.

To *Cytisus scoparius* var. *Andreanus* (fig. 39) (votes, unanimous), from Sir T. Lawrence, Burford Lodge, Dorking; Messrs. Paul & Son, and Messrs. J. Veitch & Sons. A handsome and distinct variety of the common Broom. Flowers large bright yellow, wings of a rich reddish brown.

To *Blandfordia nobilis imperialis* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. A handsome plant, bearing large bell-shaped rich orange-red and yellow flowers.

To Lilac *Madame Kreuter* (votes, unanimous), from Messrs. Paul & Son, bearing large clusters of rich purplish-crimson flowers.

To *Acer Prince Hendjery* (votes, 7 for, 3 against), from Messrs. Paul & Son. A beautiful variety, with bronzy-coloured leaves.

To *Cydonia japonica* Moorlezi (votes, unanimous), from Messrs. J. Veitch & Sons, bearing an abundance of large rich red flowers.



FIG. 39.—CYTISUS SCOPARIUS, VAR. ANDREANUS.

For this figure we are indebted to the Editor of the *Journal of Horticulture*.

Award of Merit.

To Tree Pæony Beatrice Kelway (votes, unanimous), from Messrs. Kelway & Son. Flowers large white single, of a cupped form.

To *Lunaria biennis variegata* (votes, 7 for, 3 against), from Messrs. W. Cutbush & Son, Highgate, N. Flowers deep purplish crimson.

To *Enkianthus campanulatus* (votes, 7 for, 3 against), from Messrs. J. Veitch & Sons. A shrub of compact habit, bearing small bell-shaped reddish flowers.

To Bedding Pansy Eynsford Yellow (votes, unanimous), from Messrs. H. Cannell & Sons. A bedding variety. Flowers deep yellow, very freely produced.

To *Primula Sieboldi alba magnifica* (votes, unanimous), from Messrs. Ryder & Son. Flowers large white, beautifully fringed.

To *Juniperus canadensis aureus* (votes, unanimous), from Messrs. J. Veitch & Sons. A dwarf-growing variety; young growths tipped with rich golden yellow.

Other Exhibits.

From the Royal Gardens, Kew, was sent an interesting collection of cut specimens of hardy flowering trees and shrubs, noteworthy being *Cytisus præcox*, *Viburnum cotinifolium*, *V. lantana*, *Amelanchier botryapium*, *A. canadensis*, *Pyrus Maulei superba*, *Exochorda grandiflora*, *Cerasus avium*, *C. a. fl. pl.*, *C. Mahaleb chrysocarpa*, &c.

Messrs. W. Paul & Son, Waltham Cross, sent H.P. Rose Danmark, which the Committee desired to see again.

Mr. J. Hudson, Gunnersbury House, Acton, sent flowering branches of *Cercis siliquastrum*.

Mr. W. Poupert, Twickenham, sent some well-flowered Lily-of-the-Valley.

Mr. R. Dean, Ealing, sent some pretty Alpine Auriculas and Polyanthuses.

Monsieur Hennequin, Angers, France, sent flowers of a rich-coloured variety of *Anemone coronaria*.

Mr. G. Prince, Oxford, sent Tea Rose Souvenir de S. A. Prince—a sport from Souvenir d'un Ami.

ORCHID COMMITTEE.

SIR TREVOR LAWRENCE, Bart., M.P., in the Chair, and fifteen members present.

Awards Recommended :—

First Class Certificate.

To *Odontoglossum maculatum anceps* (votes, unanimous), from W. C. Atkinson, Esq., Aigburth, Liverpool. An extraordinarily beautiful form of this old species, the flowers larger and more richly coloured than in the type.

Award of Merit.

To *Cœlogyne tomentosa* (votes, unanimous), sent by R. I. Measures, Esq., Cambridge Lodge, Flodden Road, Camberwell (gardener, Mr. H. Simpkins). A very handsome species, allied to *C. Massangeana*, but with salmon-tinted flowers. The plant exhibited was a strong one, with several sprays of flowers.

Cultural Commendation.

To Mr. Cypher, gardener to Mrs. General Studd, Royal Crescent, Bath, for *Lælia purpurata Studdii*, a fine form and well grown.

Other Exhibits.

M. L. Linden, Directeur de l'Horticulture Internationale, Parc Léopold, Brussels, forwarded two plants of a new form of *Cattleya labiata*, named *Warocqueana*. It seemed nearest to *C. l. Warneri*, but being, it was stated, from a new locality, it is probably distinct from any hitherto introduced. The flowers were richly coloured, but the plant being imperfectly developed, the Committee desired to see it again. The same firm also sent *Dendrobium Galliceanum*, a form of *D. thyriflorum*, with a curiously flattened lip; and *Odontoglossum crispum virginale*, which was certificated a few years ago.

Sir C. W. Strickland, Bart., again sent the plants he exhibited of *Cattleya citrina* in flower last year, to prove that this species need not deteriorate under cultivation.

R. I. Measures, Esq., staged a pretty new *Masdevallia* of the *M. simula* type, named *M. O'Brieniana*, and cut spikes of a fine

white *C. Mendelii*, named *C. M. "Venus"*; also plants of the finely coloured *Masdevallia ignea* Southgatei.

N. N. Sherwood, Esq. (gardener, Mr. Jones), sent a fine rose-coloured form of *Odontoglossum crispum* and a good cut spray of *Phalænopsis grandiflora*.

Sir Trevor Lawrence, Bart., M.P., sent a cut spike of *Lælia purpurata* Brysiana, with large richly coloured flowers.

Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr. Cullimore), staged *Lælia purpurata*, *Cattleya Mossiæ*, and *Bifrenaria Harrisoniæ*.

Mr. James O'Brien, Harrow-on-the-Hill, sent the new *Disa tripetaloides*.

Messrs. F. Sander & Co., St. Albans, sent a very fine form of *Odontoglossum excellens*, named "*Albert Edward*." The large labellum was white, spotted down the middle with chocolate colour; the sepals and petals yellow, with dark crimson blotches.

The Duke of Northumberland, Syon House, Brentford (gardener, Mr. Wythes), sent some well-grown specimens of the best form of *Cypripedium barbatum*.

A. Smith, Esq., Cobham, Surrey (gardener, Mr. Quarterman), also sent the same species.

G. Burnham, Esq., Paget Road, Stoke Newington, staged *Dendrobium thyrsoflorum*, with ten spikes, and the curious green-flowered *Cymbidium albucaeflorum*.

Messrs. Pitcher & Manda, Hextable, Swanley, Kent, had an interesting lot of varieties of *Orchis* and *Cypripedium calceolus*.

W. C. Atkinson, Esq., Aigburth, Liverpool, sent flowers of a new form of *Cypripedium Hookeræ*, of which the Committee desired to see plants at the next meeting.

J. T. Bennett-Poë, Esq., Thoerstone, Nenagh, again exhibited his fine spotted *Odontoglossum Pescatorei*; and specimens of *Cattleya Warneri* and *Cymbidium Lowi* were forwarded by Mr. Balderson, Hemel Hempstead.

Phaius Cooksoni.—The hybridisation by artificial means of such orchids as *Cypripediums*, *Cattleyas*, *Lælias*, *Dendrobiums*, &c. has met with so much success that it is not surprising to find that the hybridist has extended his operations to other genera. *Phaius Cooksoni*, for the figure of which (fig. 40)

we are indebted to the editor of the *Journal of Horticulture*, is among the latest productions of the hybridist's skill, being the result of a cross effected in the collection of Norman C. Cookson, Esq., of Wylam-on-Tyne, between *P. Wallichii* and *P. tuberosus*, the former being the seed parent. The plant



FIG. 40.—PHAIUS COOKSONI.

exhibited was remarkable for its salmon-coloured sepals and petals flushed with pink. The large funnel-shaped lip has a bright yellow throat, on each side of which are blotches of dark red on a tawny-coloured ground. The other hybrid *Phaius* which have been raised are *P. inquilinus* and *P. irrorata* in 1867, and *P. Sedeniana* in 1888, to which may be added *Thunia Veitchiana* in 1885.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and fifteen members present.

Award Recommended:—

First Class Certificate.

To Broccoli Veitch's Model, from the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach). Heads of medium size, very compact, and somewhat conical in shape, of fine texture and quality.

Other Exhibits.

Mr. Aslett, Warren Wood, Hatfield, sent some fruits of Alexander Peach, a fine early variety.

Mr. Hawkins, Bridgend, South Wales, sent a seedling green-fleshed Melon, which was thought promising, but too early in the season to judge of its merits.

Mr. E. Chopping, Sittingbourne, sent Apple Buggs' Apricot Pippin.

Messrs. T. Rivers & Son, The Nurseries, Sawbridgeworth, sent four varieties of Apples, viz. Gooseberry, Belle de Pontoise, Hacquin, and Peck's Pleasant, which were in fine condition for so late in the season.

The Right Hon. Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent good examples of Mushrooms and Asparagus.

From the Society's Gardens were sent seven varieties of Broccoli.

The Chairman brought forward the subject of the formation of local Fruit Committees throughout the country as a means of obtaining better information on fruits submitted to the Committee. The matter was adjourned.

SCIENTIFIC COMMITTEE.

D. MORRIS, Esq., F.L.S. (Treasurer R.H.S.), in the Chair, and seven members present.

Plant Bug (Lygus pabulinus, L.).—Mr. McLachlan exhibited specimens of a small green bug which has become very troublesome in the temperate house at Kew. It attacks Fuchsias, Rhododendrons, Camellias, &c. It has been observed

for the last ten years. Paris green or London purple (arsenical preparations) were suggested as the best remedies, fumigating being difficult in so large a place.

Ceratitis citriperda (McLeay, 1829).—Mr. Henslow gave some account of the Orange fly, which has become very troublesome in Malta. He also exhibited specimens of the grubs, pupæ, and insects. It first appeared about fifteen years ago, but has increased to a very injurious extent during the last three years. A committee was appointed in 1889 by H.E. the late Governor of Malta, who have just issued a report (which will be published shortly in the *Kew Bulletin*). The fly perforates the half-ripe Orange, and lays several eggs within it. This causes the fruit to fall prematurely. The larva finally escapes, and enters the ground to pass into the pupa stage. It is suggested that preventive measures should be taken at this period, first by collecting all fruits attacked, and mashing them up with water in a tank. Secondly, the surface of the ground should be sprinkled with a mixture of one part of sulphate of iron, finely powdered, to twenty-four parts of dry earth or sand, and subsequently slightly watered. An account of this insect (under the name *Ceratitis capitata*) will be found in the *Gardeners' Chronicle* of 1848, page 604, at which period it caused great damage to Oranges received from St. Michael's. In Malta it particularly attacks the Mandarin (*Citrus nobilis*). Cold and inclement weather is very unfavourable to the fly, which becomes much more abundant in a hot dry season.

Cerambyx miles, L.—Mr. Henslow showed specimens of Pear roots bored by this longicorn beetle; also the grubs and insects from Malta, where it is causing great damage to many fruit trees. The only remedy suggested was the well-known one of spearing. In Malta, however, the beetles attack the roots rather than the stems, so that the difficulty of reaching them is greatly increased, as the only sign of their presence may be a feebleness in the upper part of the tree, and the branches decaying, when the tree may be already past recovery. The greatest difficulty, however, is to overcome the apathy of the cultivators themselves. It is not British, but common in the Mediterranean region.

Delphinium discased.—Some leaves were sent by Mr. Haywood, of Reigate, apparently attacked by a fungus. They

were forwarded to Professor M. Ward for examination and report.

Primula metamorphosed.—Mr. A. Dean sent a number of seedlings of the “Jack-in-the-Green” form of *Primula*. In this variety the calyx is foliaceous. Of the seedlings some had assumed the “hose-in-hose” type, the calyx becoming petaloid; in others the calyx had become polysepalous, the sepals varying from the foliaceous to a setiform condition.

Primroses and Bluebells degenerating.—Mr. Henslow showed specimens grown in his garden. They were received some years ago from Wiltshire, but have degenerated on the gravelly soil of Ealing. The Bluebells become pink, then white, at the same time changing in shape from the normal cylindrical to a cup-shaped perianth. This latter form is recognised as a permanent one—viz., var. *campanulata*, of which there is a bed at Kew. Transitional stages are not uncommon. The Primroses exhibited were taken from a number of separate plants of the long-styled form; but they had nearly all assumed a homomorphic character, by the pistil being dwarfed in length, and so bringing the stigma down to the level of the anthers.

Plants exhibited.—Mr. R. I. Lynch sent an interesting series from the Botanic Gardens, Cambridge. *Neviusa alabamensis*, *A. Gray*, a curious apetalous ally of *Rhodotypos*. It has foliaceous sepals, and three or four carpels only. *Baccharis patagonica*, a shrubby composite, with flowers not unlike that of Groundsel; the florets, however, are female only, with a rudimentary corolla tightly fitting the style, and having no border. *Triosteum pinnatifidum*, *Maxim.*; *Aristolochia ringens*, *Vahl.*; *Vanda alpina*, a species not generally included in catalogues; *Arisarum proboscideum* (*Mag. Bot.*, No. 6634), from the shaded woods of Upper Arno and Apennines, a very rare plant; *Asarum Hookeri*, var. *insignis*, *Duch.*, the rarest species in cultivation. A vote of thanks was unanimously accorded to Mr. Lynch.

THE GREAT FLOWER SHOW, 1890.

THE Society's Great Summer Show, held, by the kind permission of the Treasurer and Masters of the Bench, in the Gardens of the Inner Temple, on Wednesday and Thursday, May 28 and 29, 1890, was opened by His Royal Highness the Prince of Wales at one o'clock punctually.

His Royal Highness was conducted round the various tents by Sir Trevor Lawrence, Bart., M.P., President of the Society; Baron Henry Schröder, Vice-President; D. Morris, Esq., M.A., F.L.S., Treasurer, and other members of the Council; and after the Prince had carefully inspected the exhibits, the following Address was presented to him by the President and read by the Rev. W. Wilks, M.A., Secretary of the Society:—

“ Royal Horticultural Society,

“ 117 Victoria Street, S.W.

“ May 28, 1890.

“ MAY IT PLEASE YOUR ROYAL HIGHNESS,

“ The Council of the Royal Horticultural Society desire to tender to you, on behalf of the Fellows of the Society and the Horticulturists of the United Kingdom, their grateful thanks for your presence here to-day.

“ The Royal Horticultural Society was founded in the early years of the present century, and it has been honoured with the gracious favour and support of Her Majesty the Queen and her predecessors, and was presided over for several years by the Prince Consort.

“ The Council believe that the Society has, during the 86 years of its existence, conferred incalculable benefits upon the kingdom, by directing and fostering a love of Horticulture, and by the introduction and acclimatisation of a vast number of the trees and shrubs, fruit and flowers, which beautify and enrich all parts of our country.

“ The Council are aware of the great interest taken by your Royal Highness in the work of the Royal Agricultural Society, and they are anxious to secure your interest in the work of the Royal Horticultural Society. This work they believe to be,

under the altered conditions of Agriculture, of great national importance, in that it encourages the application of Horticultural methods to Agriculture, enlarges the field of profitable cultivation of the soil, and varies and increases the food supply of the people.

“The Royal Horticultural Society, in addition to its ordinary work, is now devoting its energies to the provision of a great national want—a Central Metropolitan Hall or Home for the Horticulturists of the United Kingdom. Such buildings exist in the chief European capitals and in the United States of America, and the Council have ample evidence from amateurs and the very important trade engaged in Horticulture that they are urgently required in London.

“We earnestly trust that the aims and objects of the Society may recommend themselves to your Royal Highness’s support and approval.

“Signed, on behalf of the Council,

“TREVOR LAWRENCE, *President.*”

To this Address His Royal Highness was graciously pleased to respond in the following terms:—

“Sir Trevor Lawrence, Ladies and Gentlemen,—I am very much gratified by the Address I have just heard, and I beg to assure you that I have visited this Exhibition with the greatest possible pleasure and interest. I have always taken a great interest and pleasure in Horticulture, and I must say I have never seen a more beautiful show than that which we have here around us, nor one better arranged. The best proof of the success of the Society is the fine show we have all witnessed to-day. You have alluded to a great want—that of a Central Metropolitan Hall. I sincerely hope your labours in that respect may be successful, for I feel sure that such a Hall will be of the greatest use and advantage. Let me thank you again for the Address, and once more assure you of the pleasure I have had in being present.”

The following letter has also been received from Sir Francis Knollys:—

“Marlborough House, Pall Mall, S.W.

“May 28, 1890.

“Dear Sir Trevor,—The Prince of Wales was extremely

pleased with the Flower Show to-day, and thought the Exhibition beautiful.

“ H.R.H. said that everything went off very well.

“ Yours very truly,

“ FRANCIS KNOLLYS.”

It is a matter of great satisfaction to be able to state that the “ Great Show ” of 1890 was in every respect a vast improvement on its two predecessors held in the Inner Temple Gardens in 1888 and 1889. There were more exhibits than on former occasions, and it required four enormous tents to shelter the Orchids, Roses, Pelargoniums, Clematises, Caladiums, Calceolarias, Aroids, and innumerable other plants. The weather was exceptionally favourable during the two days of the Exhibition, and the number of visitors was even greater than in previous years. The band of the Royal Horse Guards Blue, under the able direction of Mr. Charles Godfrey, were engaged during each afternoon, the music being evidently highly appreciated by the crowds who sat and listened to it.

To give anything like a detailed account of the beautiful collections of plants brought together would be impossible, and the following summary must therefore be considered as only an outline of the most worthy exhibits.

Orchids.—These marvellously beautiful plants occupied the entire centre of the largest tent, and were tastefully arranged to the best advantage, having Palms, Ferns, &c., intermixed with them, so as to remind one of a portion of the tropics transported from its natural position. Facing the visitor as he entered was a huge specimen of *Cymbidium Lowianum*, forming the nucleus of Baron Schröder's collection. It had twenty-nine strong spikes, the number of large flowers on each spike varying from twenty to thirty, and presenting a grand sight. In the same collection was a specimen of *Cattleya Skinneri*, bearing over forty spikes of rose-purple flowers; and close by were some splendid *C. Mendelii* and its variety, *Rothschildiana*, as well as the pale rose *C. Lawrenceana delicata*. *Odontoglossums* were in great variety, being represented by some remarkable forms of *O. crispum*, *O. Andersonianum*, *O. excellens*, *O. Hallii leucoglossum*, *O. Schillerianum*, some fine varieties of *O. vexillarium*,

while *Cypripediums*—both species and hybrids—*Masdevallias*, *Dendrobies*, &c., formed altogether a most attractive group.

The display of Orchids from the gardens of the President of the Society, Sir Trevor Lawrence, Bart., M.P., were next those of Baron Schröder, and rivalled them in excellence. Among the better known kinds shown were the curious *Bulbophyllum barbigerum*, with its small but exquisitely beautiful flowers, with the labella or lips so sensitive that the faintest breath of air is sufficient to cause a great commotion among them. *Cypripediums*, *Dendrobiums*, *Cattleyas*, *Lælias*, *Masdevallias*, *Thunias*, and *Odontoglossums* were in abundance, and bore the signs of good culture, while the “Bird’s-nest Orchid,” *Neottia nidus-avis*, attracted much attention.

H. M. Pollett, Esq., of Bickley, exhibited the rare *Odontoglossum crispum Bickleyense*, remarkable for its creamy-white flowers heavily blotched with chestnut-brown; *O. cirrhosum*, *O. Coradinei*, the dwarf *O. Erstedii* with forty pretty white flowers, and that very remarkable *Cypripedium Sanderianum*, with twisted petals over eighteen inches long, were also among the group.

T. B. Haywood, Esq., had a fine collection of *Odontoglossums*, intermixed with Maidenhair Ferns, and also several highly coloured varieties of *Masdevallia* belonging to the *Harryana* and *igneae* section. *Cattleya gigas* (also known as *C. Warszewiczii*) had five large flowers of a deep rose-purple colour on one spike, and formed a striking contrast to the beautiful *Odontoglossum Harryanum*.

Some of the best varieties of *Cypripedium barbatum* were shown by the Duke of Northumberland’s gardener, Mr. Wythes, from Syon House, as well as some fine plants of *Anthurium Scherzerianum*, with brilliant scarlet spathes.

F. Wigan, Esq., of East Sheen, had some very fine *Cattleya Mendelii*, as well as *Vanda teres*, a magnificent *Phalænopsis grandiflora*, *Aërides Fieldingii*, *Cypripedium Dayanum*, *C. Curtisii*, and that beautiful “flower of May,” *Lælia majalis*.

Mrs. Studd, of Bath, exhibited a lavender-coloured *Sobralia macrantha*, and a fine specimen of *Dendrobium MacCarthiæ*.

Among the trade exhibits were some grand displays. The collection of Messrs. Sander & Co., of St. Albans, occupied a space about forty feet long, and contained a specimen of almost every

Orchid in flower at the season. The remarkable hybrid *Miltonia Bleui splendens* was shown; it has white flowers, with crimson lines at the base of the lip, and is the result of a cross between *M. vexillaria* and *M. Roezlii*. Among the others may be mentioned, as worthy of note, the unique *Miltonia vexillaria* "Fairy Queen," pure white, with a stain of lemon-yellow at the base of the lip; *Cattleya Mendelii* "Prince of Wales," having a glowing crimson lip; *Phajus Humblotii*, seen for the first time by a great many, and its white variety, *P. H. alba*; *Vanda suavis*, with a dozen spikes; *Dendrobium Dearei*, with about fifty spikes of pure white flowers just tinged with watery green at the base of the lip; *Lælia grandis*, *L. purpurata*, *Ornithocephalus grandiflorus*, *Aërides Sanderianum*, and *Oncidium roraimense*, a species closely allied to *O. sessile*, and having yellow flowers barred and spotted with dark brown. With the Orchids was also staged a new *Anthurium album maximum*, with a large creamy spathe tipped with red.

Mr. J. Cypher, of Cheltenham, contributed a large group, in which *Lælia purpurata*, *Cattleya Mendelii*, and *Dendrobium Bensoniæ* were well represented. The Dendrobes were exceptionally fine, and the *Odontoglossums* were very showy.

Messrs. Low & Co., of Clapton, had a unique collection of the beautiful *Anæctochilus Lowii*, with a background of *Cypripedium Lawrenceanum*, *C. Elliottianum*, *C. Godefroyæ*, *C. caudatum*, *C. bellatulum*, and others. Plants of the new *Phalænopsis gloriosa*, *P. amabilis*, *P. grandiflora*, *Vanda cœrulescens Boxallii*, *Cattleya Mendelii*, *C. Mossiæ*, &c., were also present, showing much variety of colour.

Mr. G. T. White, of Winchmore Hill, staged an effective group of Orchids, among which a large *Lælia purpurata* was conspicuous. Plants of the *Hippeastrum (Amaryllis) solandræflorum* *conspicuum* were also among the group, to which they gave a charm.

Messrs. B. S. Williams & Son, of Upper Holloway, displayed to advantage a fine group, among which the *Vandas* attracted attention, especially a form of *V. teres* known as "Aurora," with pretty blush-white flowers. There were also present *Calanthe veratrifolia*, with its strong erect scapes of snowy-white flowers; *C. Williamsii*, *Anguloa Clowesii*, deep-coloured *Masdevallias*, among which was *M. Veitchii*, with thirty flowers; while *Cattleyas*,

Cypripediums, Oncidiums, Lælias, and Dendrobies were in great variety.

Messrs. J. Laing & Sons and Mr. Peed also showed some well-grown Orchids among their other exhibits; while the *Disa racemosa* of Messrs. Backhouse was greatly admired on account of its rose-purple flowers.

Roses.—There were several attractive collections. Messrs. W. Paul & Son, Waltham Cross, had a large collection of specimens, as well as a fine display of cut blooms. The beautiful hybrid Moss Rose “Crimson Globe,” raised by the firm, received a first-class certificate. Other fine Roses were “Spenser” and “Crimson Queen.”

Messrs. Paul & Son, of Cheshunt, had a remarkably fine group, comprising over forty flowering specimens, among which examples of “Her Majesty” were strikingly attractive.

Some well-flowered specimens of “Niphetos” were shown by Mr. W. Rumsey, of Waltham Cross.

Ferns.—Such a fine display of Filmy Ferns was never seen as that of Messrs. Jas. Backhouse & Son, of York. There were over one hundred specimens, representing as many as fifty distinct species. Some of them were about two feet across, and were unique. Special mention might be made of *Trichomanes Luschnathianum* and its invaluable variety *T. L. prolongum*. Very handsome were *T. Borneense* and *T. meifolia*, the latter resembling a *Todea superba* in habit. The “Killarney Fern” was represented in great variety, from the largest form of *T. radicans* to the tiny *T. r. alabamense*. The “kidney-leaved” Fern, *Trichomanes reniforme*, was two feet across. The *Hymenophyllums* also presented a wide range of variety, and attention may be called to *H. tunbridgense*, of which there were several forms, *H. demissum*, *H. dilatatum*, *H. obtusatum*, *H. scabrum*, *H. magellanicum*, and others.

Messrs. Birkenhead, of Sale, staged about five hundred plants, arranged in sections, the *Adiantums*, *Aspleniums*, *Gymnogrammes*, &c., being staged together. The hardy kinds formed an attractive group in themselves, and showed some splendid forms of *Aspidium plumosum* and crested varieties of *Scolopendrium vulgare*. The *Cheilanthes*, *Nothochlænas*, and *Davallias* were worthy of special notice, as was also the new Filmy Fern *Todea grandipinnula*.

Mr. H. B. May, of Edmonton, also had an extensive group of marketable Ferns, tastefully intermixed with such ornamental stove plants as Crotons and Dracænas. The Crested Pteris raised by Mr. May, as well as *Davallia exaltata plumosa*, *Nephrolepis rufescens pinnatifida*, *N. davallioides*, *furcans*, *Davallia ornata*, and the *Gymnogrammes* and *Nothochlænas*, were very fine.

Hardy Plants and Flowers were contributed in immense numbers. Messrs. Kelway & Son, of Langport, exhibited Tree and Herbaceous Pæonies, and Irises in great variety.

Mr. T. S. Ware, of Tottenham, had a dazzling display of Poppies, among which a semi-double form was very effective; also *Spiræa japonica grandiflora*, with dense masses of flower; *Iris sibirica*, and *I. racemosa*, a handsome blue-flowered species, which contrasted pleasingly with a white-flowered *Lupinus* close by.

Messrs. Paul & Son, of Cheshunt, among their charming group of alpine, had *Ramondia pyrenaica* and its variety *alba*; *Dianthus alpina*, with large bright pink flowers; *Edraianthus serpyllifolium*, with violet-blue bell-shaped flowers, and *Myosotis alpestris*. There was also a fine collection of cut blooms of Irises.

Messrs. J. Veitch & Sons had a handsome group, comprising standard *Rhododendrons*, *Azaleas*, *Hydrangeas*, *Acers*, *Spiræa astilboides*, and large baskets of *Gladioli*. Messrs. Lane & Sons, of Berkampstead, had also some well-flowered *Rhododendrons*. Messrs. W. Paul & Sons, of Waltham Cross, had a striking collection of cut blooms of *Rhododendrons* in great variety, and trusses seedling *Azalea mollis*, with flowers of rich red and orange tints.

Messrs. Barr & Son, of Covent Garden, had a choice display of *Pyrethrums*, *Pæonies*, *Irises*, and other seasonable flowers.

Clematis.—Messrs. R. Smith & Co. were the only exhibitors of these plants, which were so well arranged that they formed one of the chief attractions of the Show. The specimens were from three to five feet high, and as much through, being arranged on balloon trellises, &c., and were heavily laden with bloom. Very conspicuous were the varieties *Blue Gem*, *Duke of Norfolk*, *Sensation*, and *Excelsior* of the blue and purple type, and *Marie van Houtte* and *Impératrice Eugénie*, two beautiful white kinds.

Soft-wooded Plants and Florists' Flowers were in great abundance. Messrs. Sutton, of Reading, had a magnificent collection of *Gloxinias*, as had also Messrs. J. Veitch & Sons, of Chelsea.

Tuberous Begonias, comprising single and double varieties were shown in effective groups by Messrs. J. Laing & Sons, Forest Hill, and Messrs. Cannell & Sons, of Swanley. The latter firm also contributed some fine Pansies and Violets, as well as a collection of cut blooms of Zonal and Decorative Pelargoniums.

Mr. J. James, of Farnham Royal, Slough, had some well-bloomed specimens of Herbaceous Calceolarias; and Mr. C. Turner, of Slough, displayed an effective group of Show and Decorative Pelargoniums.

Mr. R. Miller, of Shoreham, showed Pelargonium Pearl, a pure white sport from Madame Thibaut.

Two new Pelargoniums, named Princess Beatrice and Prince Henry, were submitted by Mr. F. Perkins, of Leamington.

A large and beautiful collection of Pansies was exhibited by Messrs. Dobbie & Co., of Rothsay, N.B. The group consisted of about one hundred bunches of fine blooms, and thirty plants in pots.

Fruit and Vegetables were not exhibited to any large extent. Mr. G. Munro, of Covent Garden, had some fine Strawberries, Figs, Grapes, Tomatoes, Beans, Peas, Mushrooms, Melons, and Cucumbers.

Messrs. Veitch & Sons, of Chelsea, and Messrs. Bunyard & Co., of Maidstone, each contributed a large and splendid collection of Apples in great variety.

Messrs. Cheal & Son, of Crawley, also exhibited some good fruits.

Grapes were shown by J. F. Campbell, Esq., of Uttoxeter (gardener, Mr. J. Hollingworth), including some fine Black Hamburgh. J. L. Mansell, Esq., of Guernsey (gardener, Mr. M. E. Peters), had some grand Muscats. Other exhibitors were the Duke of Northumberland, Syon House (gardener, Mr. Wythes); E. Pettit, Esq., Oatlands, Surrey (gardener, Mr. J. W. Reed), and Mr. Maher, Stoke Court, Slough.

Manures, insecticides, and samples of peat and other soils were shown by Messrs. Wood & Son, of Wood Green.

Messrs. C. Toope & Co., of Stepney, showed samples of boilers, and various modes of heating the same.

Mr. G. Phippen, of Reading, had some novel floral decorations; and choice bouquets were arranged by Mr. Perkins, of Coventry.

Decorations in Seaweeds were exhibited by Mr. Smout, of

Hastings; and Mrs. Hodgkins, of Withington, contributed some elegant screens, ornamented with skeletonised leaves of *Bauhinias*, *Nepenthes*, and other plants.

Special attention may be called to a striking exhibit of *Puya chilensis*, sent by T. Dorien Smith, Esq., from the Abbey Gardens, Tresco, Scilly Isles. This remarkable plant was placed at the end of the central exhibit of Orchids, and attracted universal attention on account of the number of its metallic-green flowers. The plant belongs to the natural order Bromeliaceæ, and is a native of Chili, as the specific name indicates. It grows freely out of doors in the Scilly Isles, but it will grow only under shelter in England, and for this reason is rarely seen. A plant may be seen in the succulent house at Kew, with its co-species *Puya Whitei*.

MEETING AT INNER TEMPLE GARDENS,

MAY 28, 1890.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and seven members present.

Awards Recommended:—

First Class Certificate.

To *Pæony conchiflora* (votes, unanimous), from Messrs. Paul & Son, Cheshunt. Flowers medium size, of a bright salmon-rose colour.

To Rose (H. P.) *Crimson Globe* (votes, 4 for, 2 against), from Messrs. W. Paul & Son, Waltham Cross. Flowers of large size; colour rich glowing crimson.

To *Lastrea filix-mas cristata fimbriata* (votes, unanimous), from Messrs. W. & J. Birkenhead, Sale, Cheshire. An extremely beautiful form, more elegant in habit than the ordinary crested variety of the Male Fern.

To *Aster alpinus* var. *speciosus* (votes, 5 for), from Messrs. Barr & Son, Covent Garden, and Mr. T. S. Ware, Tottenham. Ray florets blush mauve, disc orange.

Award of Merit.

To *Begonia Enchantress* (votes, 5 for), from Messrs. J. Laing & Sons, Forest Hill. A single variety. Flowers bright crimson with white centre.

To Begonia Negro Boy (votes, unanimous), from Messrs. J. Laing & Sons. Flowers of medium size and fine form; colour deep crimson.

To Begonia Henshaw Russell (votes, 5 for), from Messrs. J. Laing & Sons. A double variety. Flowers of large size; colour very bright scarlet.

To Gloxinia Mrs. J. Donaldson (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. Flowers of fine form; colour glowing crimson.

To Pyrethrum Clemence (votes, 5 for), from Messrs. Kelway & Son, Langport, Somerset. Flowers large, of good form; colour bright crimson.

To Pyrethrum Carl Vogel (votes, 6 for), from Messrs. Kelway & Son. A beautiful pure white variety.

To Lupinus Foxi (votes, 5 for), from Messrs. Kelway & Son; bearing handsome spikes of blue and white flowers.

To Delphinium Autolyceus (votes, 5 for), from Messrs. Kelway & Son; bearing massive spikes of rich violet-purple flowers.

To Pelargonium Prince Henry (votes, 6 for), from Mr. F. Perkins, Leamington. A decorative variety. Flower of a brilliant carmine-red, the centre and margin pure white.

To Anthurium album maximum (votes, 6 for), from Messrs. F. Sander & Co. An excellent variety, differing from the type in having larger "spathes."

To Canna Madame Crozy (votes, unanimous), from Messrs. Paul & Son. Flowers large, deep scarlet; leaves bright green.

To Gloxinia Her Majesty (votes, unanimous), from Messrs. Sutton & Sons, Reading. An erect variety. Flowers large, pure white.

To Gloxinia Prince of Wales (votes, unanimous), from Messrs. Sutton & Sons. An erect variety. Flowers rich crimson with white margin.

To Gloxinia Princess of Wales (votes, unanimous), from Messrs. Sutton & Sons. An erect variety. Flowers pale pink, white margin.

To the Strain of new Netted Gloxinias (votes, unanimous), from Messrs. Sutton & Sons. Flowers of various colours, mottled with white.

To Begonia Rev. W. Wilks (votes, 4 for), from Messrs. H.

Cannell & Sons, Swanley. A double variety. Flowers well formed, pale pink.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., in the Chair, and eleven members present.

First Class Certificate.

To *Cattleya Mendelii* Prince of Wales (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. This was a very fine flower, with rich dark purplish crimson labellum.

To *Miltonia Bleui splendens* × (votes, unanimous), from Messrs. F. Sander & Co. This is a fine form of *M. Bleu's* hybrid between *M. vexillaria* and *M. Roezlii*. The flowers are white, with a few lake-coloured lines at the base of the lip, and a rosy-purple blotch at the base of each petal.

To *Miltonia vexillaria* Fairy Queen (votes, unanimous), also from Messrs. F. Sander & Co. The finest clear white form which has yet appeared, no colour being in it except a tinge of chrome yellow at the base of the labellum.

To *Dendrobium MacCarthiæ* (votes, unanimous), exhibited by Mrs. General Studd, Royal Crescent, Bath (gardener, Mr. George Cypher). This fine old Ceylon species is not generally well cultivated in gardens, but the plant shown had seventeen fine large white flowers tipped with rose, the slipper-shaped labellum having purple spots at the base, and a large crimson blotch in the centre.

Award of Merit.

To *Lælia purpurata* Empress, from Mr. J. Cypher, Exotic Nursery, Cheltenham. A fine white form, the purple colouring, of the lip being divided at the front by a broad white tip.

To *Dendrobium Bensoniæ album* (Mr. J. Cypher), a variation in which the chocolate colour on the lip of the type is absent.

To *Dendrobium Falconeri delicatum* (Mr. J. Cypher), another variety in which the dark colouring of the ordinary forms of the species is wanting, the flowers of the variety being simply tipped with delicate rose colour.

To *Cattleya Lawrenceana delicata*, from Baron H. Schröder (gardener, Mr. Ballantine). This is a lighter form of *C. L. concolor*; the flowers white and lilac.

To *Sarcopodium Dearei* (Baron Schröder). A very singular Bornean species closely allied to *S. Lobbiai*. The flowers are large, yellow-striped, and veined with reddish brown; the curious labellum delicately balanced on a hinge or flexible claw.

To *Cypripedium Volonteanum*, from Messrs. F. Sander & Co., St. Albans. This appears to be an improved form of *C. Hookeræ*, the petals and pouch broader than in the type; the rose-coloured expanded tips of the petals spotted with dark brown.

To *Oncidium roraimense* (Messrs. F. Sander & Co.), an ally of *O. sessile*, with large yellow flowers, the sepals and petals spotted with light brown.

Other Exhibit.

Drewett O. Drewett, Esq., Riding-Mill-on-Tyne (gardener, Mr. Keeling), exhibited two hybrid *Cypripediums*.

FRUIT COMMITTEE.

PHILIP CROWLEY, Esq., in the Chair.

Awards Recommended:—

Cultural Commendation.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for very fine examples of Strawberry Auguste Nicaise.

Other Exhibits.

C. Allhusen, Esq., Stoke Court, Slough (gardener, Mr. Maher), sent fruits of Peaches and Nectarines.

Mr. Hopkins, High Cross, Framfield, Sussex, sent specimens of Cucumber High Sheriff.

Messrs. J. Veitch & Sons, Chelsea, sent a fruiting plant of the St. John Fig, stated to be very early and to retain its first crop well.

The Right Hon. Lord Foley, Ruxley Lodge, Esher (gardener, Mr. Miller), sent Peaches, Melons, and Mushrooms.

From the Society's Gardens was sent an interesting collection of Radishes, the following being considered the best:—*Turnip, or round varieties*: Scarlet Forcing, White Round, and Scarlet, White-tipped. *Olive-shaped*: Scarlet Olive-shaped and French Breakfast. *Long-rooted*: Wood's Long Frame, and Long White.

The other awards made at the Temple Show were :—

SILVER CUPS.

- To Baron Schröder, for a group of Orchids.
 To Sir Trevor Lawrence, Bart, M.P., for a group of Orchids.
 To Messrs. F. Sander & Co., for a group of Orchids.
 To H. M. Pollett, Esq., for a group of Orchids.
 To Mr. J. Cypher, for a group of Orchids.
 To Messrs. B. S. Williams & Son, for a group of Orchids.
 To Messrs. Paul & Son, for a group of Roses.
 To Messrs. Backhouse & Son, for a collection of Filmy Ferns.
 To Mr. H. B. May, for a collection of Foliage Plants.
 To Messrs. W. & J. Birkenhead, for a collection of Ferns.
 To Messrs. J. Laing & Sons, for a group of Foliage and Flowering Plants.
 To Messrs. Wm. Paul & Son, for a collection of Roses.
 To Messrs. Perkins & Son, for Bouquets.
 To Messrs. J. Laing & Son, for collection of Begonias.

MEDALS.

Silver Gilt Flora.

- To Messrs. J. Peed & Sons, for a group of Anthuriums, &c.
 To Messrs. J. James & Son, for a group of Calceolarias.
 To Mr. C. Turner, for a group of Pelargoniums.
 To Messrs. J. Veitch & Sons, for a group of Gloxinias.
 To Messrs. Sutton & Sons, for a group of Gloxinias.
 To Mr. W. Iceton, for a group of Palms.
 To Mr. F. W. Wiltshire, for a group of Caladiums.
 To Messrs. W. Cutbush & Sons, for a group of Foliage and Flowering Plants.
 To Messrs. J. Veitch & Sons, for a group of Foliage and Flowering Plants.
 To Messrs. H. Cannell & Sons, for a group of Begonias.
 To Mr. T. S. Ware, for a group of Hardy Herbaceous Plants.
 To Messrs. Kelway & Son, for a group of Hardy Herbaceous Plants.
 To Messrs. Barr & Son, for a group of Hardy Herbaceous Plants.
 To Messrs. Paul & Son, for a group of Hardy Herbaceous Plants.

To Mr. G. Monro, for a collection of Fruit and Vegetables.

To T. B. Haywood, Esq., for a group of Orchids.

To Messrs. H. Low & Co., for a group of Orchids.

To Messrs. R. Smith & Co., for a group of Clematis.

Silver Flora.

To Messrs. H. Lane & Son, for a group of Rhododendrons.

To Messrs. H. Cannell & Sons, for a group of Calceolarias.

To Messrs. J. Veitch & Sons, for a collection of Apples.

To the Duke of Northumberland, for a group of Orchids.

To Mr. G. F. White, for a group of Orchids.

Silver Banksian.

To Mr. W. Rumsey, for a group of Roses.

To Messrs. Paul & Son, for a group of Alpine and Herbaceous Plants.

To Messrs. Balchin & Son, for a group of *Leschenaultia biloba* major.

To Messrs. J. Veitch and Sons, for a group of Herbaceous Plants.

To Messrs. Dobbie & Co., for a group of Pansies.

To Mr. J. F. Campbell, for a collection of Grapes.

To Mr. J. L. Mansell, for a collection of Grapes.

To Mr. J. R. Featherby, for a collection of Grapes and Tomatoes.

To Mr. E. Pettit, for a collection of Grapes, Peaches, and Tomatos.

To Messrs. G. Bunyard & Co., for a collection of Apples.

To Mr. F. Wigan, for a group of Orchids.

To Mr. G. Phippen, for Bouquets, &c.

GENERAL MEETING.

JUNE 10, 1890.

Rev. W. WILKS (Secretary R.H.S.) in the Chair.

ELECTIONS :—

Fellows, 55.—E. W. Alleyne, R. B. Archibald, A. J. Ballhachet, Major-Gen. J. Bonus, M. Burn, G. Burnham, Captain H. J. Charrington, Mrs. H. Clementi-Smith, F. Cooper,

G. H. Cooper, C. Cotes, J. Cowan, Mrs. A. M. Day, H. Dewes, J. F. Ebner, J. Edwards, H. Elliott, J. Gemmings, G. P. Greenfield, Paul Hardy, J. Hemmerde, G. A. Hillier, J. Holmes, J. B. Howell, J. Humfrey, R. B. James, J. Leavers, V. T. Lewis, J. Mackinnon, Mrs. P. Mackinnon, J. Mallet, Rev. C. MacMichael, J. E. Mapplebeck, N. Masterman, Mrs. Midlane, W. M. Mitchell, Miss M. W. Newbon, H. W. Nixon, G. Norfolk, R. C. Notcutt, C. J. N. Palmer, G. A. Perry, W. H. Philipps, G. De Quatteville, E. E. Reade, E. W. Richardson, E. B. Rogers, E. F. L. Twynam, E. J. Walker, Mrs. Walkinshaw, R. Walters, A. White, F. Wright, R. Woodhouse, G. Wootten.

Mr. G. Paul, F.R.H.S., and Mr. R. Irwin Lynch, A.L.S., F.R.H.S., both read papers on "Herbaceous Pæonies."

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and sixteen members present.

Awards Recommended :—

Silver Gilt Flora Medal.

To Messrs. Kelway & Son, Langport, for a magnificent collection of Pæonies, Pyrethrums, Delphiniums, and Irises.

Silver Banksian Medal.

To Messrs. Paul & Son, Cheshunt, for a beautiful collection of cut hardy flowers, comprising Shirley and Iceland Poppies, Irises, Pæonies, &c.

Bronze Banksian Medal.

To Messrs. B. S. Williams & Son, Upper Holloway, for an interesting and well-grown collection of Sarracenias.

To Messrs. W. Cutbush & Son, Highgate, for a large collection of Ivies, containing some of the best sorts in cultivation.

To Mr. G. Prince, Oxford, for some beautiful flowers of Tea Roses.

To Messrs. H. Cannell & Sons, Swanley, for single and double flowered Pelargoniums (cut blooms).

To S. Barlow, Esq., Stakehill House, Castleton, Manchester, for a beautiful stand of Florists' Tulips.

First Class Certificate.

To *Bertolonia Souvenir de Gand* (votes, unanimous), from Messrs. B. S. Williams & Son. Foliage of a rich lilac-crimson on a green ground.

To *Crinum brachynema* (votes, unanimous), from the Earl of Rosebery, Mentmore (gardener, Mr. J. Smith). Flowers pure white; a handsome plant.

To *Sweet Briar Lord Penzance* (votes, 11 for, 5 against), from Lord Penzance, Godalming (gardener, Mr. Baskett). The result of a cross between the *Sweet Briar* and *Rosa Harrisoni*. Flowers of a pale copper colour.

To *Rodgersia podophylla* (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea; bearing panicles of yellowish flowers.

Award of Merit.

To *Pæony* (single) *Stanley* (votes, unanimous), from Messrs. Kelway & Son. Very deep crimson.

To *Pæony* (double) *Princess Mary* (votes, unanimous), from Messrs. Kelway & Son. Creamy white.

To *Pæony* (double) *Duchess of Teck* (votes, 15 for, 1 against), from Messrs. Kelway & Son. Centre creamy-white, guards rose.

To *Delphinium Alfred Kelway* (votes, unanimous), from Messrs. Kelway & Son. Tall spikes of flowers—deep indigo blue.

To *Pæony* (double) *Sainfoin* (votes, unanimous), from Messrs. Kelway & Son. Large bright rose.

To *Lobelia Reine Blanche* (votes, unanimous), from Mr. J. Witney, Turvey, Bedfordshire. Flowers pure white, very freely produced.

To *Xerophyllum asphodeloides* (votes, 13 for, 3 against), from Messrs. Paul & Son. Flowers creamy white.

To *Achillea mongolica* (votes, unanimous), from Messrs. Paul & Son. Flowers snow-white; very pretty.

To *Begonia* (double) *Golden Queen* (votes, unanimous), from Messrs. H. Cannell & Sons. Flowers finely formed, bright yellow.

To *Gloxinia Agnes Cook* (votes, 15 for, 1 against), from Messrs. H. Cannell & Sons. Flowers white, with purple spots.

To *Begonia* (double) *Black Douglas* (votes, unanimous), from Messrs. J. Laing & Sons, Forest Hill. Flowers bright crimson.

To *Begonia Madame Pfitzer* (votes, unanimous), from Messrs. J. Laing & Sons. Flowers rich yellow.

Other Exhibits.

Messrs. J. Veitch & Sons put up a pretty group of Pæonies, Delphiniums, and Hydrangeas.

From the Royal Gardens, Kew, were sent the curious *Pachira insignis*, and flowers of *Solanum Wendlandi*, and the beautiful *Nymphæa stellata zanzibarensis*.

O. T. Hodges, Esq., Lachine, Chislehurst, sent some pretty varieties of *Ionopsidium acaule*.

The Silver Challenge Cup offered for the best collection of Herbaceous Pæonies was awarded to the Rev. W. Wilks for some fine varieties.

ORCHID COMMITTEE.

Sir TREVOR LAWRENCE, Bart., M.P. (President R.H.S.),
in the Chair, and eleven members present.

Awards Recommended:—

First Class Certificate.

To *Phaius Humblotii albus* (votes, unanimous), from Baron Schröder, The Dell, Egham (gardener, Mr. H. Ballantine). This is an exquisite variety, differing from the wholly rose-tinted typical *P. Humblotii* in having the sepals and petals pure white. It is a native of Madagascar.

To *Batemannia Wallisii* (votes, unanimous), staged by Messrs. F. Sander & Co., St. Albans. A very fine species, allied to *B. Burtii* and *B. meleagris*. Flowers wax-like, four inches across, the sepals and petals white at the base and tinged with yellow and brown over the surface; lip white at the base, with a purple blotch in the centre, and tipped with yellowish brown.

To *Sobralia macrantha* var. *rosea* (votes, 9 for, 1 against), from Mrs. General Studd, Royal Crescent, Bath (gardener, Mr. G. Cypher). This is a beautiful and delicately tinted form, in which the flowers are lavender or pale rose, the labellum yellow in the throat and white at the base. The plant was sent to the Temple Show, but travelled badly, and the Committee desired to see it again. On this occasion it was past its best, but sufficient proof remained of its being distinct.

To *Cattleya intermedia Parthenia*, sent by Sir Trevor Lawrence, Bart., M.P. The plant exhibited had very large flowers

of the clearest white, and this variety is the only instance of true albino in *Cattleya intermedia*.

To *Cypripedium* seedling (*C. niveum* × *C. ciliolare*), exhibited as *C. Aylingii* × (votes, unanimous), from C. J. Hollington, Esq., Forty Hill, Enfield (gardener, Mr. Ayling). This is a really distinct and handsome hybrid; in the colour of its flowers it is close to *C. niveum*, but its petals are much longer and broader than in that species; and so also are the sepals, especially the lower ones, which equal in form and size the upper. The upper sepal is white, with several narrow pink lines; petals white, with distinct purple dotted lines following the nervures; lip white, flushed with rose.

Awards of Merit.

To *Odontoglossum Pescatorei*, Tilgate variety (votes, unanimous), sent by J. H. Nix, Esq., Tilgate, Crawley (gardener, Mr. R. Young). The plant, which was splendidly grown, and to which a Cultural Commendation was voted, had two spikes, bearing together some hundred and twenty flowers of medium size, the departure from ordinary *O. Pescatorei* consisting in the sepals having purplish blotched lines, and a few spots of purple on the petals.

To *Odontoglossum Galeottianum* (votes, unanimous), sent by T. Statter, Esq., Whitefield, Manchester (gardener, Mr. Johnson). This is a very rare and interesting species, in growth near *O. Cervantesii*, but with flowers resembling the white form of *O. nebulosum*.

To *Cattleya Mendelii* "Alfred Smee," from A. H. Smee, Esq., The Grange, Hackbridge. A noble form, with large flowers, the throat of the labellum being unusually white, and its front lobe broad, finely frilled, and of a rich crimson.

To *Cattleya labiata*, var. *Warneri* (votes, unanimous). A large and highly coloured form from Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr. Cullimore).

Other Exhibits.

Sir William Marriott, Down House, Blandford, sent a seedling Orchid, resulting from a cross between *Cattleya Mossiæ* and *Lælia purpurata*. Messrs. James Veitch & Sons exhibited the same cross, which the Committee decided was inferior to *Lælio-*

Cattleya Canhamiana previously sent out by Messrs. Veitch. C. L. N. Ingram, Esq., Elstead House, Godalming (gardener, Mr. Bond), staged what purported to be a seedling of the same parentage as the last two mentioned, but its flowers seemed to exhibit more of the appearance of *Lælia Bootliana* (*Cattleya lobata*) than *L. purpurata*, and the Committee requested to see it again.

F. Wigan, Esq., Clare Lawn, East Sheen (gardener, Mr. W. H. Young), sent a fine plant of *Phalænopsis grandiflora*, to which a Cultural Commendation was awarded, and cut flowers of *Cattleya Mendelii* and *Lælia purpurata Russelliana*.

Malcolm S. Cooke, Esq., Kingston Hill, staged a fine plant of *Cattleya intricata* var. *maculata*, like a dwarf *C. guttata Prinzii* (*C. amethystoglossa*) with a *C. intermedia* lip. Also various other *Cattleyas* and *Epidendrum vitellinum majus*.

A. H. Smee, Esq., The Grange, Hackbridge, exhibited his *Cattleya Mendelii hackbridgensis*. A very handsome form, with white sepals and petals, the latter heavily tipped with crimson, and a very richly coloured lip. Also cut flowers of *C. Mossiæ* "Mrs. Smee," very fine.

Sir Trevor Lawrence, Bart., M.P., sent a fine white *Miltonia vexillaria*, *Dendrobium MacCarthiæ*, a fine specimen of *D. thyrsoflorum*, and a pretty light form of *Cattleya Mossiæ*.

Messrs. B. S. Williams & Son, Upper Holloway, staged in their group *Cattleya Mossiæ decora* and a spotted form of *Odontoglossum crispum*.

Messrs. James Veitch & Sons exhibited the new *Dendrobium lineale*, from New Guinea, with a spray of numerous white flowers, the lip marked with crimson lines.

From the Duke of Northumberland's garden, Syon House, Brentford, Mr. Wythes brought flower-spikes of the fine old *Oncidium sphacelatum*.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and eleven members present.

Awards Recommended :—

Cultural Commendation.

To Messrs. T. Rivers & Son, The Nurseries, Sawbridgeworth, for fine fruits of Cherries Early Rivers and Belle d'Orléans.

Other Exhibits.

The Earl of Rosebery, Mentmore, Leighton Buzzard (gardener, Mr. J. Smith), sent good fruits of Strawberry A. F. Barron, grown in pots.

Messrs. James Veitch & Sons, Chelsea, sent samples of Fig Pingo de Mel, closely resembling White Marseilles.

Mr. J. F. Pascoe, Adelaide, South Australia, sent through Messrs. Elder, Smith & Co. five varieties of Apples for comparison with English sorts: *Dunn's Seedling*—In appearance like New Hawthornden or Small's Admirable, tender, not very juicy, good flavour, sweet. *Cleopatra*—Near Golden Noble in appearance. *No. 2*—Very tender, wanting in flavour, rather mealy. *No. 1*—Resembling Red Astrachan; like *Cleopatra* in flavour. *Gari-baldi*—Slightly acid, might cook well.

The following resolution, proposed by Mr. Bunyard and seconded by Mr. Cheal, was carried:—

“That in the opinion of this Committee the climate of England and South Australia differ so materially that it is almost impossible to identify the fruit sent with recognised English sorts.”

From the Society's Gardens were sent ripe early Strawberries, Crescent City, Noble, and King of the Earlies, showing Crescent City to be the earliest by several days.

SCIENTIFIC COMMITTEE.

D. MORRIS, Esq., F.L.S. (Treasurer R.H.S.), in the Chair,
and seven members present.

Delphinium, Injured Foliage of.—Prof. M. Ward reported upon the specimens sent to the last meeting. The damage appeared to have occurred in the bud, and was probably due to the low temperature of the night of May 31. There was no fungus, and he had met with a similar case elsewhere. With regard to the lowness of temperature, it was remarked by Prof. Church that at Twickenham 10 per cent. of Tomatoes were destroyed on that night, Mr. Morris observing that the thermometer on the grass at Kew registered 27° F., or five degrees of frost.

Cerambyx miles, L.—On a further examination of the caterpillars or boring beetles, brought to the last meeting by the Rev.

G. Henslow from Malta, Mr. McLachlan noticed three specimens of the Cerambyx, and two of a Lamellicorn, or Stag-beetle, as well as one of the Wood-leopard moth, which had perforated the stem of a Cassia (though it was usually found in Pear trees) from Mr. Harry's garden at St. Julian's, Malta. Another remedy, in addition to that of "spearing," was suggested by Mr. Sandford, viz., to blow tobacco-smoke down the hole, when the beetle would attempt to escape, and could be easily caught. It is very important to observe where the beetles lay their eggs, and to catch them on the wing at the time. The name was wrongly reported in the account published in the *Gardeners' Chronicle* of the proceedings of the last meeting; and the name of the plant-bug should also have been inserted, *Lygus pabulinus*, L.

Tcerya Purchasi, Maskell.—Mr. Morris exhibited some mounted specimens, received from Mr. Lewis, of Ealing, of this so-called "cottony cushion" scale insect from Australia, prepared for the Kew Museum; they included adult females, with ovisacs, and the "Lady-bird," *Rodolia Tceryæ*, as well as remains of the *Tcerya* which had been destroyed by the *Rodolia*.

The Fog Report.—Mr. Morris called attention to the fact that the Royal Society had assigned £100 "on the recommendation of the Government Grant Committee, for an inquiry into the composition of London fog, with special regard to the constituents of fog injurious to plant life." An informal conversation followed with reference to chemical investigations to be undertaken at the laboratory of University College, under the superintendence of Dr. Oliver.

Cynomorium coccineum.—Mr. Henslow exhibited specimens of this parasitic flowering plant from Malta. It was formerly supposed to grow only in "The Generals' Rock," a small island close to Gozo; but is now found at Mnaidra, on the south side of Malta, and in Sicily and Algiers. It is popularly known as *Fungus melitensis*, and formerly in great repute as a styptic remedy for hæmorrhage, &c. It is parasitic upon *Inula crithmoides*, a shrubby yellow-flowered Composite, which abounds on the rocks of Malta, giving the appearance of Furze bushes at a distance.

Lemon Seeds Germinating.—Mr. Henslow showed specimens of embryos which had begun to germinate while within the fruit.

GENERAL MEETING.

JUNE 24, 1890.

JAMES DOUGLAS, Esq., in the Chair.

ELECTIONS.

Fellows, 16.—J. F. Alcock, E. Bennett, A. Couchman, T. Cramp, G. Evans, H. Field, E. Hart, H. J. Jones, Mrs. Lamotte, J. H. Maiden, F.L.S., W. MacGowan, Miss Nicholson, A. V. Ramsey, Dr. W. J. Russell, F.R.S., Lady Vincent, Mrs. M. E. White.

The Rev. C. Wolley-Dod, M.A., read a paper on "Hardy Herbaceous and Alpine Plants."

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and seventeen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. Paul & Son, Cheshunt, for a large and effectively arranged collection of cut flowers of herbaceous plants, consisting of Delphiniums, Pæonies, Potentillas, &c.

To Messrs. J. Veitch & Sons, for an attractive collection of cut flowers, comprising Aquilegias, Canterbury Bells, Delphiniums, &c.

To Messrs. Barr & Son, Covent Garden, for a good collection of cut flowers of Pæonies, Irises, &c.

Bronze Banksian Medal.

To Messrs. H. Cannell & Sons, Swanley, for a large collection of well-developed Pæonies.

First Class Certificate.

To *Philadelphus microphyllus* (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea, and Messrs. Paul & Son, Cheshunt. A distinct species, bearing somewhat small pure white flowers in profusion.

Award of Merit.

To *Campanula persicifolia alba grandiflora* (votes, unanimous), from Messrs. Paul & Son, Cheshunt. A beautiful variety, having pure white bells of exceptionally large size.

To Carnation Pride of Great Britain (votes, unanimous), from Mr. H. J. Jones, The Nursery, Lewisham. A fine variety; flowers large, pure yellow.

To Rose (H.P.) Marchioness of Lorne (votes, unanimous) from Messrs. W. Paul & Son, Waltham Cross. Flowers rose, shaded bright carmine in the centre; very free flowering.

To Rhododendron Ajax (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. A beautiful greenhouse hybrid variety. Colour rich salmon.

To Begonia (double) Miss Eastwood (votes, 14 for, 3 against), from Messrs. H. Cannell & Sons, Swanley. Flowers of good form, bright tinted rose.

To Pæony (double) Daubenton (votes, 15 for, 2 against), from Messrs. Paul & Son, Cheshunt. Flowers large, well formed, deep rose-coloured.

To Rose (H.P.) J. D. Pawle (votes, unanimous), from Messrs. Paul & Son. Flowers glowing crimson; delightfully fragrant.

To Rose (Bourbon) Mrs. Paul (votes, unanimous), from Messrs. Paul & Son. Flowers of good form, blush suffused with rose.

To Pelargonium (Zonal) Midsummer (votes, unanimous), from Messrs. J. R. Pearson & Sons, Nottingham. A well-formed flower, rose-pink, shaded carmine in the centre.

Other Exhibits.

Messrs. J. Veitch & Sons sent cut specimens of *Kalmia latifolia splendens*; a fine form.

Sir C. W. Strickland, Bart., Hildenley, Malton, sent *Crinum crassipes*. A beautiful species; flowers large, blush suffused with rose.

Messrs. W. Paul & Son sent several new Roses, including Spenser, a beautiful light hybrid perpetual.

Messrs. G. Bunyard & Co., Maidstone, sent an interesting and beautiful collection of Garden Roses.

Messrs. Laxton Brothers, Bedford, sent flowers of some beautiful Seedling White Pinks.

Mr. R. I. Lynch, Botanic Gardens, Cambridge, sent an interesting collection of species of Pentstemons.

Rev. W. Wilks, Shirley Vicarage, Croydon, sent a large gathering of Shirley Poppies, containing some very delicate and beautifully coloured varieties.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., in the Chair, and twelve members present.

Awards Recommended:—

First Class Certificate.

To *Epiphronitis Veitchii* × (votes, unanimous), from Messrs. Jas. Veitch & Sons, Chelsea. This is another of the phenomenal bigeneric crosses raised by Messrs. Veitch, and it results from crossing *Epidendrum radicans* with the pollen of *Sophronitis grandiflora*. *Epiphronitis Veitchii* is of compact habit, and the plant exhibited bore terminal heads of rich scarlet flowers, resembling those of *E. radicans*, but larger.

To *Lælio-Cattleya eximea* × (*Lælia purpurata* crossed with *Cattleya Warneri*) (votes, unanimous), the latter being the seed-bearer. The flowers are large; sepals and petals rosy-lilac; lip

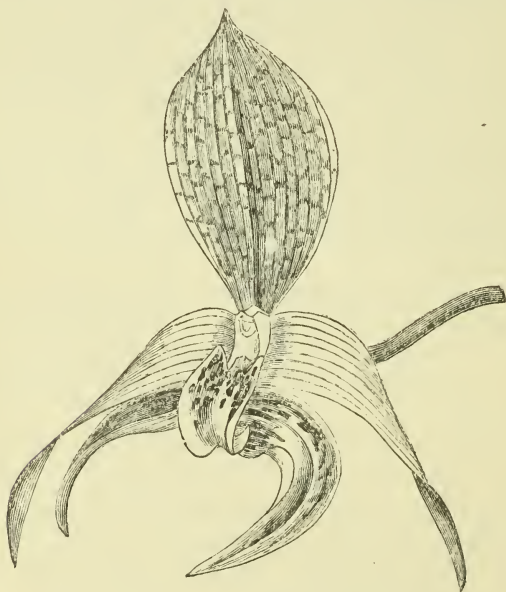


FIG. 41.—SARCOPODIUM GODSEFFIANUM.

violet-purple, with brownish lines at the base, and lilac margin. Also from Messrs. Jas. Veitch & Sons, the raisers.

To *Sarcopodium Godseffianum** (votes, unanimous), from

* We are indebted to the editor of the *Gardeners' Magazine* for our illustration.

Messrs. F. Sander & Co., St. Albans. This remarkable Philippine species is of the *S. Lobbii* section, and in general appearance nearest to the Bornean *S. Dearei*, but having the curious white labellum spotted with purple, and the broad yellow dorsal sepal veined with purple, giving it almost the appearance of stained glass. The plant is the smallest in growth of its section and bears the largest flowers.

To *Cattleya Gaskelliana*, Cooke's variety (votes, unanimous), from Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr. Cullimore). A variety with wholly clear rose flowers, which had previously received an Award of Merit.

Award of Merit.

To *Masdevallia Courtauldiana* × (*rosea* × *Shuttleworthii*). A pretty variety, with soft rose flowers, from Sydney Courtauld, Esq., Bocking Place, Braintree (gardener, Mr. A. Wright).

To *Lælio-Cattleya Canhamiæ* × (votes, unanimous), from Messrs. Jas. Veitch & Sons; (*Lælia purpurata* × *Cattleya Mossiæ*). The flowers are in shape similar to *Lælio-Cattleya Canhamiana*, the reverse cross, but are lighter in colour, the labellum especially, which is marbled with rose on the front lobe.

To *Disa tripetaloides* (votes, unanimous), from Sir Charles W. Strickland, Bart., Hildenley, Malton, Yorks. A pretty species, with dense heads of white flowers, spotted with crimson, each flower nearly an inch across. Some of the sprays had over twenty flowers, all fully expanded.

Other Exhibits.

Sydney Courtauld, Esq., exhibited a new *Masdevallia* like a white form of *M. infracta*.

Malcolm S. Cooke, Esq., Kingston Hill, sent a fine specimen of *Catasetum atratum*, having a plant of a handsome new species of *Catasetum*, with large yellow and chestnut flowers, growing with it, as imported.

Messrs. F. Sander & Co., St. Albans, exhibited several forms of *Phaius Humblotii*; *Sarcopodium Lobbii*, to compare with their new *S. Godseffianum*; and a well-flowered plant of *Angræcum Chailluanum*.

Messrs. Jas. Veitch & Sons staged *Thunia Veitchiana* (T.

Marshalliana × T. Bensoniæ), which had been previously certificated.

De B. Crawshay, Esq., Rosefield, Sevenoaks, exhibited a spray of *Cattleya gigas* "Mrs. de B. Crawshaw," a variety with large richly coloured flowers; and Messrs. J. Crespin & Son, Nelson Street, Bath, also staged sprays of *Aërides Lobbi*, *Cattleyas*, and *Lælias*.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and sixteen members present.

Awards Recommended:—

Award of Merit.

To Strawberry Crescent City, from Messrs. Paul & Son, Old Nurseries, Cheshunt, on account of its earliness.

Cultural Commendation.

To Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. J. Hudson), for very fine fruits of Nectarine Lord Napier.

To Lord Wimborne, Canford, Wimborne (gardener, Mr. Crasp), for good examples of Nectarine Stanwick Elruge.

To Mr. W. Palmer, Thames Ditton House, Thames Ditton, for excellent samples of Pea Sutton's Duke of Albany and Long-pod Beans.

Other Exhibits.

Messrs. Paul & Son sent fruits of seven kinds of Strawberries, viz. Noble, Pauline, Bidwell, King of Earlies, Vicomtesse Hericart de Thury, La Grosse Sucrée, and Commander.

Mrs. Whitbourn, Great Gearies, Ilford (gardener, Mr. J. Douglas), sent Melon The Countess.

Seedling Melons were shown by Mr. W. Palmer, Thames Ditton, and Mr. G. Wythes, Syon House, Brentford.

Mr. C. Osman, Sutton, Surrey, sent six sticks of Rhubarb Stott's Monarch, weighing 24 lbs.

Mr. H. Field, Leamington, sent Tomato Brunswick.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and nine members present.

Iris reticulata, Protection against Mildew upon.—Rev. C. W. Dod described his experiments of dusting the bulbs of this Iris with flowers of sulphur before planting them, as well as the ground where they were placed, in August 1889. The remarkable effect was to arrest all attempts at growth, the bulbs being this year exactly in the same state as when planted. Professor Church suggested that the cause of the arrest might be due to a slow oxidation of the sulphur, producing sulphurous acid, which could be absorbed by the tissues, coupled with a consequent deprivation of oxygen necessary for the development of roots.

Blight.—Mr. Wilson remarked on the excessive prevalence of blight this year, *Iris Kämpferi* being for the first time attacked by thrips.

Datura Leaves diseased.—Dr. Masters exhibited some leaves with small spongy-like processes by the ribs, &c. They were referred to Dr. Oliver for examination and report.

Spanish Iris with Supernumerary Parts.—Dr. Masters exhibited some flowers with four petals instead of three, and one with a four-celled ovary. The multiplication of parts had followed the chorisism or bifurcation of the fibro-vascular cords of the organs in question.

Hybrid (?) between Raspberry and Strawberry.—Dr. Masters exhibited drawings of the flower of this remarkable plant, which Mr. Culverwell had raised. It is generally known as *Rubus Leesii*, Bab. The pedicel and sepals are finely setose, but it wants the epicalyx of the Strawberry. Moreover, the carpels of the hybrid are setose and not glabrous. They appear to be abortive. Prof. Babington in his "Manual of British Botany" records it as being found at Ilford Bridges, Devon, and Dunster, Somerset, with a reference to "A. N. H., ser. 2, ix. 124."

Hybrid between the Black Currant and Gooseberry.—He also showed drawings of various organs of this hybrid, also received from Mr. Culverwell. The foliage more nearly resembles that of the Gooseberry, being glabrous, except along the nerves of the under surface. The petiole, however, is glabrous, and not hairy

as in the Gooseberry. It has no glands as the Black Currant. The inflorescence is a many-flowered raceme, intermediate in length between the many-flowered Currant and the few-flowered Gooseberry. The flowers are larger than those of either parent, with the sepal lobes erect, and not reflexed as in them. The stamens are contabescent, and the style is villous in the middle, whereas those of the parents are glabrous. The stigma or apex of the style is deeply cleft, those of the parents being sub-capitate and obscurely two-lobed.

Laelia, two-lipped.—Dr. Masters also showed the not uncommon production of two labella in this Orchid. It is probably due to chorisism.

Antirrhinum with Virescent Corolla.—He exhibited a specimen with the corolla in the form of a calyx, but undertook to examine it further and report upon it.

Bigener Orchid.—Mr. Veitch exhibited an interesting plant called *Epiphronitis Veitchi*, being a bigener between *Epidendrum radicans*, the male parent, and *Sophronitis grandiflora*, the female. It received a first-class certificate, and was unanimously awarded a botanical certificate by the Scientific Committee.

Calceolarias dying off.—Mr. Henslow showed plants which had suddenly died in his garden. They had decayed in the lower part of the stem, having the cortex split for a length of about an inch. Mr. Wilks said he was familiar with the fact, and attributed it to the plants having first suffered from drought and then being overwatered; the sap was thus unable to rise, and burst the tissues. Mr. Henslow observed that this interpretation corresponded with the conditions of the case in question. It was a small crimson-flowered variety with hairy foliage. The common yellow-coloured species showed no signs of injury whatever.

Pistacia Lentiscus, Galls on.—Mr. Henslow exhibited branches of this plant from Malta covered with flat galls formed from the metamorphoses of the leaflets, which had assumed a "leguminous" shape. It is not uncommon in the Mediterranean regions. Mr. McLachlan observed that at least four species of aphides made galls on the *Pistacia*. Mr. Dod observed that Cicero speaks of the *Lentiscus* bearing fruit thrice a year; but this was probably to be explained by the gum being collected three times annually.

Orange, Pistilody of Stamens in.—Mr. Henslow showed

specimens of this malformation. It was well known before, but, as Dr. Oliver observed, it appears to be rather more common than usual during the present season.

Caprificus, or Wild Fig.—Mr. Henslow showed fruits of the Wild Fig from Malta, used by the peasants for “caprification” or fertilisation of the autumn varieties of cultivated Figs. Unlike the latter, the wild Fig called “Duccar” invariably grows in walls or crevices of the rocks. It produces three crops per annum, each supplying a brood of the Blastophaga. This wild Fig is not required for the “summer” or “St. John’s” Fig, which ripens about the end of June (the 24th being St. John the Baptist’s Day), as it contains both male and female blossoms. Mr. Henslow could find no male blossoms at all in the first or winter crop of the Duccar. It is not known whether the autumn Figs are entirely female or not, but a Maltese botanist, Signor Gatto, has undertaken to make a thorough investigation upon this and other as yet obscure points involved in the caprification in Malta, as it appears to differ in some respects in other countries.

MEETING AT CHISWICK.

JULY 4.

JOHN LEE, Esq., in the Chair, and twelve members present.

The Committee inspected the collections of Broad Beans, Lettuces, and Currants growing in the Gardens—××× (signifying “Meritorious in the first degree”) being given to the following:—

Broad Beans.

Bunyard’s Exhibition Long-pod, from Messrs. G. Bunyard & Co., Maidstone, considered by the Committee to be identical with Long Tom, sent by Messrs. R. Veitch & Son, Exeter.

Lettuces.

Prince of Wales (Cos), from Messrs. Jas. Veitch & Sons, Chelsea.

Early White Self-folding Trianon, from Messrs. Vilmorin, Andrieux & Co., Paris.

The Superintendent was instructed to prepare a report on the Currants.

GENERAL MEETING.

JULY 8, 1890.

D. MORRIS, Esq., M.A. (Treasurer R.H.S.), in the Chair.

ELECTIONS.

Fellows, 9.—H. C. Baber, C. S. Bruce, J. Burrell, Frank Howard, J. E. Knight, C. E. Osman, J. E. Street, Rev. G. J. Thomas, R. Wake.

Captain H. J. Elwes, F.L.S., delivered a lecture on "Cultivated Lilies."

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and seventeen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Lord Rothschild, Tring Park, Tring (gardener, Mr. E. Hill), for a large and very excellent group of Carnation *Germania*.

Silver Banksian Medal.

To Mr. T. S. Ware, The Nurseries, Tottenham, for an interesting collection of Lilies, the most noticeable variety being *L. Bolanderi*, which was certificated.

To Messrs. J. Veitch & Sons, Chelsea, for an extensive group of Flowering Shrubs and other hardy plants.

To Messrs. Barr & Son, Covent Garden, for a varied collection of Herbaceous Plants in flower.

To Messrs. Paul & Son, Cheshunt, for an excellent collection of cut Roses—the best H.P.'s being well represented.

First Class Certificate.

To *Babiana rubro-cyanea* (votes, 14 for, 3 against), from Heer de Graaf, Leyden. Flowers of a deep rich blue.

To *Spiræa Bumalda variegata* (votes, unanimous), from Messrs. J. Veitch & Sons. A very dwarf shrubby variety; leaves yellow, sometimes tinged with red.

Award of Merit.

To Rose (Polyantha) The Engineer (votes, 13 for, 4 against), from Mr. J. T. Dyke, Bourne, Lincoln. Flowers rich carmine.

To Liliun Bolanderi (votes, unanimous), from Mr. T. S. Ware. Flowers deep claret-red, with darker spots.

To Zingiber D'Arceyi (votes, 15 for, 2 against), from Messrs. J. Veitch & Sons. Leaves prettily variegated.

To Gloxinia Gaiety (votes, 16 for, 1 against), from Messrs. J. Veitch & Sons. Flowers rich crimson, with an outer band of white.

To Gloxinia Nestor (votes, unanimous), from Messrs. J. Veitch & Sons. Flowers intense scarlet, and of good form.

To Pelargonium (double) Turtle's Surprise (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley. Flowers deep scarlet; plant of excellent habit.

To Carnation Mrs. Sanders (votes, 15 for, 2 against), from Mr. H. J. Jones, Lewisham. Flowers yellow, very free flowering; a good border flower.

To Sweet Pea Stanley (votes, unanimous), from Mr. H. Eckford, Wem, Salop. Flowers rich dark plum.

To Sweet Pea Dorothy Tennant (votes, unanimous), from Mr. H. Eckford. Flowers rosy puce.

Commendation.

To the strain of Canterbury Bells (votes, unanimous), from Mr. R. Dean, Ealing. An excellent series; flowers pleasing and diversified.

Other Exhibits.

Mr. J. Hall, florist, &c., Cambridge, sent *Scolopendrium vulgare cristata* Morgani—a crested form raised true from spores.

The Duke of Northumberland, Albury Park, Guildford, sent an effective batch of *Alstrœmeria* Seedlings.

Messrs. H. Cannell & Sons sent cut flowers of double and single *Begonias*.

Mr. H. J. Jones sent a group of Seedling *Petunias*.

The Duke of Northumberland, Syon House, Brentford, sent flowering branches of *Clethra arborea* and *Stuartia virginica*.

Messrs. Saltmarsh & Sons, The Nurseries, Chelmsford, sent very fine cones of *Abies nobilis glauca*.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., in the Chair, and eleven members present.

Awards Recommended :—

First Class Certificate.

To *Lælia grandis* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. An exceedingly rare species, totally different from the smaller *L. xanthina* usually bearing this name. *L. grandis* is of the same form as *L. purpurata*, and almost as large. Sepals and petals buff-yellow, lip dark purplish crimson, lighter towards the edge.

To *Masdevallia Schröderiana*, from Baron H. Schröder, The Dell, Egham (gardener, Mr. Ballantine). This pretty species resembles *M. Reichenbachiana*, but has whiter flowers suffused at the base with rosy red. The plant exhibited had several flowers and buds, and gave evidence of its floriferous character.

To *Cattleya Empress Frederick* × (votes, unanimous), from Baron H. Schröder, The Dell, Egham. The plant exhibited had white sepals and petals, and finely expanded labellum of a bright magenta-crimson hue. It is said to be from a cross between *C. labiata Mossiæ* and *C. l. Dowiana*.

Award of Merit.

To *Cypripedium Youngianum* × (*C. Roebelenii* crossed with the pollen of *C. superbiens*), from Messrs. F. Sander & Co. The general appearance of this pretty hybrid is similar to *C. Morganæ*, but the petals are longer and the flowers paler than in that variety, the whole of the body of the flower being ivory white, prettily flushed and spotted with rose. A First Class Certificate was proposed and seconded for this plant, but not carried, after which an Award of Merit was passed by unanimous vote.

To *Zygopetalum crinito-maxillare* × (votes, unanimous), from the Right Hon. Lord Rothschild, Tring Park, Tring (gardener, Mr. E. Hill). The plant exhibited bore flowers resembling those of *Z. Gautieri*; sepals and petals pale green blotched with brown, lip violet.

Cultural Commendation.

To Messrs. F. Sander & Co., for *Aërides expansum* Leoniaë, a fine species of the *A. falcatum* section ; previously certificated.

Other Exhibits.

From the gardens of Sir Trevor Lawrence, Bart., M.P., the President of the Society, came a plant of the extraordinary *Bulbophyllum grandiflorum*, having the long segments of the flowers curved forward, and of a yellowish white colour, marbled with chocolate. It comes from New Guinea, and is figured in the "Lindenia," t. 108. Also the equally curious *Sarcopodium psittacoglossum*, the sepals and petals yellow with narrow purple lines, the labellum purple and curiously shaped like a parrot's tongue. Sir Trevor Lawrence also sent the handsome blue *Aganisia cœrulea*, previously certificated, and a flower of a very large variety of *Cypripedium Curtisii*.

Messrs. F. Sander & Co., St. Albans, staged a group consisting of *Cypripedium Elliottianum* and *C. Rothschildianum*; *Oncidium hastatum Ernestii*, which has a very showy labellum, much larger than the type; *Cattleya gigas Sanderiana*; and a very prettily spotted form of *Odontoglossum crispum*, named *punctatissimum*.

FRUIT COMMITTEE.

R. D. BLACKMORE, Esq., in the Chair, and ten members present.

Awards Recommended :—*Silver Banksian Medal.*

To Messrs. T. Rivers & Son, The Nurseries, Sawbridgeworth, for a magnificent collection of fruit, containing very fine examples of Cherries, Peaches, Nectarines, and Plums.

Bronze Banksian Medal.

To Messrs. J. Veitch & Sons, Chelsea, for excellent fruits of thirty varieties of Strawberries.

To Messrs. Paul & Son, Cheshunt, for good examples of twelve varieties of Strawberries, including *Auguste Boisselot*, which was certificated.

First Class Certificate.

To Fig St. John, from Messrs. J. Veitch & Sons.

To Strawberry Auguste Boisselot, from Messrs. Paul & Son ; a very large richly flavoured fruit.

Award of Merit.

To Melon Highlands' Hybrid, from Mr. J. F. Wilkinson, Minchinhampton. A scarlet-fleshed variety of good flavour.

To Melon Victoria Cross, from Mr. W. A. Cook, Calne, Wilts. A scarlet-fleshed variety, and finely flavoured.

To Melon Syon House Seedling, from the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes). This was also a scarlet-fleshed variety of very rich flavour.

To Cucumber Allan's Favourite, from Lord Suffield, Gunton Park, Norwich (gardener, Mr. W. Allan) ; a large handsome fruit.

To Strawberry Incomparable, from Mr. H. Ridgewell, Cambridge ; fruits well flavoured, dark red colour.

Cultural Commendation.

To Mr. H. Ridgewell, Cambridge, for very fine examples of five varieties of Strawberries.

To Messrs. G. Bunyard & Co., Maidstone, for excellent fruits of twelve varieties of Strawberries.

To the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach), for fine examples of Strawberries Sir Joseph Paxton and President.

To Mr. H. J. Jones, Lewisham, for good examples of Tomatoes.

Other Exhibits.

Mr. J. Collis, Acton Green, Chiswick, sent a Seedling Strawberry.

Mr. Rodway, George Town, Demerara, sent dried Bananas, which the Committee approved of as a valuable addition to the dessert.

SCIENTIFIC COMMITTEE.

R. McLACHLAN, Esq., F.R.S., in the Chair, and five members present.

Acacia Seyal, stipules.—Mr. Henslow showed a specimen of the stipules of this Central and North African species, having globular bases, about the size of large cob-nuts, terminating with slender points, two inches in length. They had been perforated and inhabited in all probability by ants. A discussion arose as to the possibly hereditary character of the abnormal size of the stipules of this and other species—*e.g.*, of *A. sphærocephala*, the “Bull’s horn” Thorn (as compared with the needle-like stipules of some Australian species), even when cultivated in England, and in the absence of ants. It is well known that the presence of the ants causes an increase of the growth of the stipules, although they hollow them out and consume the pith as food. It is, however, the opinion of Dr. Beccari and M. Treub, who have studied many “ant-plants,” that the comparatively large size of the stipules, even before they are attacked by ants, is due to the hereditary effects of the irritations set up in previous generations of trees (“Malesia,” ii. and “Ann. Jard. Bot. Buit.” iii. p. 129). An interesting description of *A. sphærocephala*, &c., is given in Belt’s “Naturalist in Nicaragua,” p. 218.

Lilium Martagon, fasciated.—Mr. Elwes sent a large fasciated stem of this species, in which this abnormality had not been previously observed. It is not uncommon in other species. It bore at least 100 flowers on the flattened stem, which was about two inches across.

Oak-staves, perforated.—Mr. Morris exhibited portions of staves of beer-barrels, made in England in 1889, and shipped to Aden in March 1890 from the Indian Store Department. Of a hundred barrels nearly every one was found to leak, holes having been bored into the wood by the grub of some beetle. It was referred to Mr. Blandford for examination; but in the absence of all specimens of the creature, and any details in the history of the case—as, *e.g.*, whence the beetles could be derived—it is somewhat difficult to suggest a remedy.

Carnations attacked by Wireworm (?).—Samples of plants and grubs were received from R.H.S. gardens at Chiswick. It

was suggested by Mr. Barron that the creature might have been introduced in the "peat moss" (employed as bedding for horses) used as manure. It appeared to be a species of *Tipula*. Mr. Blandford undertook to make a further examination. Mr. Morris and Mr. Wilks remarked that the Carnations were much destroyed in a similar manner both at Kew and Shirley. Mr. Henslow remarked upon the wonderfully efficacious effect of gas-lime in destroying wireworms. Thinly spread over the ground and dug in, a plot where previously not a Cabbage could be grown in his garden has borne excellent crops for several years since.

Gladiolus with Unsymmetrical Flowers.—Mr. Henslow showed a spray in which the two uppermost flowers were normal, the two lower reversed in position, having the stamens and style declinate, while one flower had them situated laterally. The streaked petals corresponded with the positions of the stamens in each case. The tubes did not appear to be twisted in any way. As the style and stigmas were altered in correlation to the stamens, it would probably not affect the fertilisation by insects, the latter being simply dusted with pollen in a different part of the body from usual. Mr. Morris remarked that he had observed similar alterations in the flowers of the *Gladiolus* at Kew.

Foliage with Foliaceous Appendages.—Mr. Henslow exhibited specimens (1) of leaves of *Acalypha eremurus* with narrow wing-like excrescence on the ribs and veins of the upper surface. Dr. Müller has described this peculiarity as a true specific character in this plant. (2) *Aristolochia Siphon*, with apparent outgrowths on the lower surface. These appeared to be due to cracks in the leaf when young; a portion of the leaf then protrudes below, when adhesion again takes place. (3) *Arum maculatum* with a foliaceous appendage at the base of the blade. (4) Several specimens of Cabbage-leaves with wing-like appendages to the ribs, as well as tubular and funnel-like appendages. Mr. Henslow pointed out the similarity between these foliar excrescences and many which occur on petals, especially *Gloxinias* (exhibited), Primroses, Orchids, and in the "crested" *Cyclamen*. In all cases they appear to be due to hypertrophy, and are a means of disposing of excess of nutriment, the foliar excrescences being correlated to the chorisis or branching of the fibro-vascular cords. In a monstrous form of *Mignonette*, described by the late Professor J. S. Henslow in 1833, the ovules partook of identically the

same character as the excrescences on the Cabbage-leaves—viz., cups, funnel-shaped structures and foliar expansions. Such appears to explain the origin of ovules as being the outgrowths from the hypertrophied margins (placentas) of carpellary leaves.

Plants exhibited.—Sir Trevor Lawrence sent *Bulbophyllum grandiflorum* and *Sarcopodium psittacoglossum*, for which a botanical certificate was unanimously awarded. A liliaceous plant with dark-coloured flowers and two new species of Lily were sent by Mr. Ware. They were forwarded to Kew to be named.

CARNATION AND FERN CONFERENCE AND EXHIBITION.

JULY 22, 1890.

W. MARSHALL, Esq., in the Chair, and twelve members
present.

Awards Recommended:—

First Class Certificate.

To *Clematis erecta* fl. pl. (votes, unanimous), from Messrs. Paul & Son, Cheshunt. Flowers double, white, star-shaped, and very freely produced.

To Carnation (border) *Rosalind* (votes, unanimous), from Mr. R. Dean, Ealing. Well-formed flowers, dotted with deep crimson on a light ground.

To Carnation (border) *Rowena* (votes, unanimous), from Mr. R. Dean. Flowers deep scarlet.

To *Begonia* (double) *H. M. Stanley* (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley. The flowers glowing scarlet, large and of fine form.

To *Begonia* (double) *Lafayette* (votes, unanimous), from Messrs. H. Cannell & Sons. Flowers bright scarlet, of medium size, freely produced.

To *Gloxinia* *Mrs. Stanley* (votes, 10 for, 2 against), from Messrs. H. Cannell. Flowers white, dotted with rose; very pretty.

To *Rose* (*Noisette*) *l'Idéal* (votes, unanimous), from Messrs.

Paul & Son, Cheshunt. Flowers rich apricot-yellow, flushed with crimson.

Other Exhibits.

Mr. R. Dean, Ealing, sent a collection of cut Pentstemons.

An interesting group of plants was sent from the Royal Gardens, Kew, comprising *Gladiolus primulinus*, *Æschynanthus speciosus*, *Solanum Wendlandi*, *Hedychium flavescens*, *Littonia modesta*, &c.

Messrs. H. Cannell & Sons sent very fine cut blooms of Begonias.

Messrs. J. Veitch & Sons, Chelsea, sent some cut trusses of beautiful hybrid Greenhouse Rhododendrons.

The Duke of Northumberland, Albury Park, Guildford, sent *Delphinium Duchess of Northumberland*; flowers deep blue.

The Committee inspected the collections of Carnations, Picotees, Stocks, and Pansies growing in the Gardens, when the following awards were made—× × × signifying “Meritorious in the first degree,” × × “Meritorious in the second degree” :—

Carnation	× × ×	Juliette (R.H.S.),	bright rosy purple self.
”	”	Mrs. Frank Watts (Ware),	white self.
”	”	Juno (Paul & Son),	rose self.
”	”	Snowdrift (Fisher, Son & Sibray),	white self.
”	”	Horace (Dan),	scarlet self.
”	”	Maggie Laurie (Dicksons & Co.),	delicate blush self.
”	”	Caledonia	” bright purple.
”	”	The Moor (Dean),	dark crimson.
”	”	Rowena	” bright scarlet.
”	”	Clown (Dodwell),	yellow ground.
”	”	Oxonian	” salmon self.
”	× ×	Beatrice (Fisher, Son & Sibray),	buff self.
”	”	Fair Maid (Dean),	blush.
Picotee	× × ×	Romeo (Paul & Son).	
”	”	Augusta	”
”	”	Pica	”
”	”	B. J. Bryant (R.H.S.).	
”	”	Favourite (Turner).	
Pansy	× × ×	The Bride (Dobbie),	creamy white, edged blue.
”	”	Duchess of Fife	” orange, edged bronze.
”	”	Neptune	” dark purple, top petals pale.
”	× ×	Duchess of Sutherland (Dobbie),	pale lavender.
”	”	Marchioness of Tweeddale	” pure white.
Stocks	× × ×	Large Ten-Week (Putz),	brilliant rose.
”	”	”	” purple.
”	”	”	” white.
”	”	”	” sulphur yellow.
”	”	Dwarf Ten-Week	” lilac.

ORCHID COMMITTEE.

Sir TREVOR LAWRENCE, Bart., M.P., in the Chair, and six members present.

Awards Recommended :—

First Class Certificate.

To *Epidendrum falcatum* (votes, unanimous—H. J. Veitch, Esq., in the Chair), from Sir Trevor Lawrence, Bart., M.P. This is the original form of the species, and may be botanically different from the form known as *E. Parkinsonianum*, with which it is often considered synonymous. The flowers of the plant exhibited were over two inches across, pure white, flushed with rose at the backs of the sepals.

To *Oncidium chrysorhapis* (votes, unanimous—H. J. Veitch, Esq., in the Chair), also from Sir Trevor Lawrence. Its flowers were numerous, on spikes two feet in height; yellow, with brown lines and bars on the sepals. The general form of the flowers, and especially of the side lobes of the labellum, is like *O. cornigerum*.

Award of Merit.

To *Grammatophyllum multiflorum* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. This is an old but rare species, and the plant exhibited had a spike of over seventy greenish flowers blotched with brown.

To *Masdevallia Rolfeana* (votes, unanimous), from Messrs. F. Sander & Co. A definite idea of this may be formed by calling to mind a dwarf *M. Reichenbachiana* with the colouring of *M. calura*, both of which species grow together, and *M. Rolfeana* might be a cross between the two. The tubular part of the two lower sepals and the free parts of all three is of a rich maroon tint; the portion of the upper sepal combined in the tubular or concave portion of the flower being yellow, and the tail-like continuations of all the sepals also bright yellow. The whole flower has much of the appearance of *M. Schröderiana*, especially in the widely extended tails of the lower sepals, which constitute a distinct feature from the closely arranged parallel ones of *M. calura*.

Botanical Certificate.

To *Masdevallia elephanticeps* (votes, unanimous), from Messrs. Jas. Veitch & Sons, King's Road, Chelsea. This fine species, although discovered by Warszewicz about forty years ago, is still rare. The variety exhibited had large waxlike purplish-crimson flowers and yellow tails to the sepals.

Other Exhibits.

Messrs. Pitcher & Manda, The United States Nurseries, Hextable, Swanley, Kent, and New York, exhibited the beautiful *Cypripedium Lawrenceanum* Hyeatum, and a supposed new variety of *Dendrobium* near to *D. crystallinum*, but seeming to exhibit traces of *D. Bensoniæ*.

Messrs F. Sander & Co. exhibited *Dendrobium bracteosum* under its erroneous synonym *D. chrysolabium*; also *Cattleya Schofieldiana* var.

Messrs B. S. Williams & Son exhibited an unknown Orchid (? *Dipodium*), which was referred to Kew to be named.

FRUIT COMMITTEE.

T. F. RIVERS, Esq., in the Chair, and six members present.

Awards Recommended:—*Silver Banksian Medal.*

To Earl Fortescue, Castle Hill, South Molton, Devon (gardener, Mr. R. Nicholas), for three very handsome fruits of Queen Pine Apple, weighing 21 lbs.

First Class Certificate.

To Melon Advance, from Mr. J. Barkham, Longford House, Ryde. A seedling scarlet-fleshed variety, of excellent flavour.

Cultural Commendation.

To Mr. Sibson, Wigton, Cumberland, for wonderfully fine examples of Black Currants.

Other Exhibits.

The Duke of Northumberland, Albury Park, Guildford, (gardener, Mr. W. C. Leach), sent fruits of Raspberry Hornet.

Mr. W. A. Cook, Calne, Wilts, sent six dishes of Peas.

The Committee examined the collections of Peas growing in the Gardens, when $\times \times$, signifying "Meritorious in the second degree," were given to the following varieties:—

The Daisy, from Messrs. James Carter & Co. A dwarf wrinkled marrow.

Boston Hero, a tall white wrinkled marrow.

Ambassador, from Mr. H. Eckford. A tall green wrinkled marrow.

SCIENTIFIC COMMITTEE.

D. MORRIS, Esq., F.L.S. (Treasurer R.H.S.), in the Chair,
and eight members present.

Oak-staves, Perforated.—Mr. Blandford has made an exhaustive report on the wood perforated by *Trypodendron Quercus*, *Eichhoff*, brought to the last meeting, which will be published in the *Kew Bulletin*. It appears that the cylindrical holes run transversely through the wood, having ramifying galleries at right angles; several of the tubes were empty, others filled with *débris*, which might be easily ejected by the beer. He discovered one hole which had been artificially plugged, as well as others hidden by the iron bands, conclusively proving that the beetles (several specimens of which were found) must have been in the wood before it was made into casks.

Carnations Attacked by Tipula.—Mr. Blandford confirmed his suspicion that it was a species of *Tipula* which has ruined so many Carnations during the present season.

Nest of Weaver Bird from Paraguay.—Mr. Blandford exhibited a nest made of the mycelium of some fungus. It was in the sclerotoid condition formerly known as *rhizomorpha*. Mr. Morris observed that the Banana birds of Jamaica made a similar use of *rhizomorpha*. It is peculiar in being arboreal, and is found under the bark. It is common in the territories of the Argentine Republic.

Rhizomorpha of Agaricus melleus.—Mr. Morris exhibited a specimen of this mycelium received from Mr. F. C. Fennell, of Westgate, Wakefield. It was found, at a depth of 70 yards, in a coal-mine. It appears to be particularly destructive to props and timber made of the Spruce Fir, but not to the Larch, this proving to be the best for subterranean supports, though more expensive.

Cherry-Laurel Fruits Poisonous to Peafowl.—Mr. Morris recorded the fact that some peafowls at Kew had lately died, their crops being found to be full of the fruit of the common Laurel. As the pulp is harmless, it was suggested that perhaps their death was due to prussic acid being developed from the kernels, though the presence of the stone appeared to negative that being the cause, otherwise it was difficult to account for it.

Laburnum as a Poison.—Dr. Müller observed that although Laburnum appears to be exceedingly poisonous in all parts of the tree, the roots, flowers, and seeds having all been known to have poisoned human beings, yet rabbits will eat the bark with impunity.

Phylloxera at Chiswick.—Mr. Morris called the attention of the Committee to the appearance of this disease, and invited the members to pronounce as to the treatment of it, as it was undoubtedly present in one vinery in the Chiswick Gardens, containing young plants from Hungary. It was first observed on a single plant at one corner, but both root and leaf galls had since been found on another plant at the other end. Although the presence of the Phylloxera would suggest the opportunity for a careful series of investigations and experiments, yet it was the opinion of the Committee that it was far too serious a matter, and they were unanimous in counselling instant destruction of everything growing in the house. The following process was suggested, and was carried out at once:—(1) Syringing the whole of the interior of the fabric as well as the ground and Vines with water, then to burn sulphur, the presence of the water being desirable in order to absorb the sulphurous acid gas; this process to be repeated; (2) to burn every part of every plant, as well as to calcine the soil thoroughly; (3) to remove and burn all rotten or defective wood that may be in the house; and lastly (4) to have the whole of the woodwork well scraped and repainted. It is hoped that these suggestions will be useful, and followed out elsewhere should the Phylloxera appear in other gardens.

Vines, Atrophied Foliage of.—Mr. Morris showed specimens of a very common condition of Vines, several occurring in the house above mentioned, in which the lateral shoots were dwarfed, the leaves being only about an inch across. It has been a source

of great trouble to Vine-growers for many years. Dr. M. Ward undertook to examine into the cause.

Tomatoes diseased.—Mr. Morris showed specimens from the gardens at Chiswick attacked by *Phytophthora*. As this appears to infect the Tomatoes when growing in the open, it is suggested that whenever possible they should be at once transferred indoors to a warmer and drier atmosphere, as Tomatoes require a warmer climate than the average English summer to ripen properly. This treatment appears to invigorate them, and renders them not only less susceptible to the disease, but has been known to check the further growth of the fungus at once.

Heteræcismal Fungi.—The following communication was received from Mr. Plowright, accompanied by specimens:—

Puccinia Festuæ, n. sp.—This species occurs on *Festuca ovina* and *F. duriuscula*. The æcidiospores occur on the common Honeysuckle. After a long series of unsuccessful cultures upon various grasses and other plants, extending over a period of eight years, I was this year induced to try the effect of placing the spores of *Æcidium periclymeni* on *Festuca duriuscula* and *F. ovina*. In both cultures the Uredo was produced. I also succeeded in producing the *Æcidium* on *Lonicera periclymenum* from the germinating teleutospores. The last named are in shape somewhat similar to those of *P. coronata*, with which species they have previously been confounded. The material from which the *Æcidium* was produced is on the table, as well as the artificially produced uredospores and the æcidiospores from which they were produced.

Puccinia Agrostidis, n. sp.—The æcidiospores of this species have long been known under the name of *Æcidium Aquilegiæ*. Mr. J. H. A. Jenner was kind enough last August to conduct me to a secluded spot in Abbott Wood, near Lewes, where he had for several years previously found the *Æcidium* on the Wild Columbine. We carefully examined the grasses in the vicinity, and came to the conclusion that the teleutospores probably occurred on *Agrostis alba*. Material was brought home to Lynn, and from it this year the *Æcidium* was produced on *Aquilegia vulgaris*. In May of this year Mr. H. T. Soppett conducted me to a spot on the east shore of Lake Windermere where the *Æcidium Aquilegiæ* occurs. Specimens were obtained from which both Mr. Soppett and myself produced the uredospores on *Agrostis*

alba and vulgaris. The material used for these cultures is on the table.

Puccinia Digraphidis, Soppitt.—Mr. Soppitt's discovery that the *Æcidium* on Lily-of-the-Valley is connected with a *Puccinia* on *Phalaris arundinacea* is very interesting—the more so when we remember that this grass is known to be the host plant of several other *Pucciniæ*—viz., *P. sessilis*, which has its *æcidio*-spores on *Allium ursinum*, *P. Phalaridis*—which has its *æcidio*-spores on *Arum*, *P. maculatum*, and a form of *P. coronata*—the life-history of which is at present uncertain. The Lily-of-the-Valley on which I produced the *Æcidium* from *P. Digraphidis* has been growing in my garden at King's Lynn since the year 1879, and has hitherto been free from any *Æcidium*; but eight days after the germinating *æcidio*spores of *P. Digraphidis* were applied to it the Lily leaves began to show signs of the presence of the parasite, which in due course developed into the perfect *Æcidium*. This culture was done at the request of Mr. Soppitt, in order that his discovery of the host plant bearing the teleuto-spores of the Lily-of-the-Valley *Æcidium* might be confirmed by an independent observer. The *Æcidium* produced and the material used for producing it are on the table.

Uromyces maritima, Row.—The life-history of the *Æcidium* on *Glaux maritima* was unknown until the present year. In August last Mr. Peake, jun., of Hull, was kind enough to conduct me to the only known British locality for this *Æcidium*—on the banks of the Humber. From an examination of the surrounding plants I came to the conclusion that the *Æcidium* on *Glaux* was due to the *Uromyces* on *Scirpus maritimus*. A supply of the *Uromyces* was collected, and this spring applied to *Glaux maritima* in my garden at King's Lynn. In due course the *æcidio*-spores were produced; these in turn were applied to healthy plants of *Scirpus maritimus* and the *Uredo* produced. The specimens used in their culture are exhibited.

Æcidium on Black Currant Leaves.—This fungus was found by my friend the Rev. Canon Du Port, on the Norfolk Broads, in June 1890. Its life-history is at present unknown, although I have visited the spot, and hope to be able to work it out from material collected. Whether it be the same species that occurs on the Gooseberry pretty commonly in various parts of the country experimental research alone can determine.

Melampsora vernalis on *Saxifraga granulata*.—This fungus, which is doubtless the teleutospore form of the so-called *Cæoma Saxifragæ*, was found by Mr. James Taylor of Clarkfarquhar, is also exhibited.

Melampsora on *Salix repens*.—The uredospores of this were this year produced on a plant of *S. repens*, that has been growing for three or four years in my garden, by applying to it the spores of *Cæoma Orchidis*. It is probably a distinct and undescribed species, as no effect was produced on *S. caprea* and *viminialis* by the *Cæoma* spores. *C. Orchidis* has been the subject of many cultures made by me during the past nine years. The infecting material and the uredo produced are exhibited.

Potato Disease.—It would be highly desirable if some simple experiments could be conducted this year. The long-continued rains will doubtless induce the disease, and as such experiments could very easily be made it seems a pity the opportunity should be let slip. The effect of high moulding of alternate rows of some variety fairly susceptible is all that is required to show the protective influence of an efficient earth-covering on the tubers; but the recent experiments in France and in America, showing how powerful are the restraining influence of copper dressings applied to the foliage of the plants upon the development of the *Phytophthora*, certainly ought to be tried. Now that we know the mycelium of the *Phytophthora* is localised, and that it does not extend "down the stems and along the roots," it is obvious that the spread of the disease takes place only by the enormously prodigious production of the conidia; hence it follows that any agent which can arrest this development, and also sterilise such conidia as may alight upon the healthy foliage, must have a powerful influence for good in checking the spread of the disease. The power that copper dressings have in limiting the spread of the *Peronospora* on the Vine has been known in France for many years.

A vote of thanks was accorded to Mr. Plowright for his valuable communication.

MEETING AT CHISWICK.

JULY 23, 1890.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and nine members present.

The Committee again inspected the collections of Carnations and Picotees, also the Pelargoniums, growing in the Gardens, and made the following awards—× × × signifying “ Meritorious in the first degree,” × × “ Meritorious in the second degree ”:—

Carnation	× × ×	Mrs. Reynolds Hole (Veitch), terra-cotta.
”	”	Gloire de Nancy (Veitch), white, large.
”	”	Germania (Veitch-Benary), yellow.
”	”	Raby Castle (Turner-Veitch), rose-pink, fine constitution.
”	”	Guiding Star (Ware), scarlet self.
”	”	Will Threlfall (Paul), bright yellow.
”	”	Edith (Fisher, Son & Sibray), pale pink, spotted scarlet.
”	”	Canary ” pale yellow.
”	”	Comtesse de Paris (Paul), pale blush.
”	”	Penelope (Hooper), white self.
”	”	Merlin (Lakin), deep crimson.
”	”	Boadicea (Douglas), purple flaked.
”	”	Caractacus ” crimson bizarre.
”	”	Feuerball (Benary), deep scarlet self.
”	”	Mirakel von Zerbst (Benary), very dark crimson.
”	”	Albrecht Duesser ” deep rose, crimson flake.
”	”	Orestes (R.H.S.), pale rose.
”	”	Countess of Ellesmere (R.H.S.), pale flesh, spotted with crimson.
”	”	Scarlet Premier (Storrie), scarlet self.
”	”	Rose Celestial (Turner), rose self.
”	× ×	Hypatia (Paul), white self.
Picotee	× × ×	Grandiflora (Veitch), deep rose.
”	”	Alice Ayres (Veitch-Ware), white, slightly streaked.
”	”	Admiration (Veitch), dark purple edge.
”	”	Agnes Chambers (Turner), yellow ground, lilac edge.
”	”	Colonial Beauty ” terra-cotta, streaked.
”	”	Dorothy (Turner), terra-cotta.
”	”	Atalanta (Dodwell), yellow ground.
”	”	Diana ” white self.
”	”	Ariel ” yellow.
”	”	Andromeda ” terra-cotta flaked.
”	× ×	Grosteen (Veitch), purple edge.
”	”	Alfred Grey (Dodwell), yellow ground.

- Double-flowered Ivy-leaved Pelargoniums—
 „ × × × De Quatrefages (Lemoine), violet-magenta.
 „ „ Souvenir de Charles Turner, flowers of a deep pink.
 „ „ Galilee, No. 1, soft lilac.
 „ „ „ No. 2, soft rosy pink.
 „ „ Madame Thibaut, deep pink.
 „ „ Le Printemps, rosy pink.
 „ „ Comtesse Horace de Choiseul, satiny rose.
 „ „ Gloire d'Orléans, bright pink.
- Single-flowered Ivy-leaved—
 „ × × × Gem, blush white.
 „ „ Mrs. H. Cannell, deep mauve-purple.
- Zonals „ Charles Mason (Pearson), fine scarlet, of good habit.
 „ „ Mons. Poirer (Lemoine), flowers of a beautiful purplish
 shade, of good habit of growth.
- Stock, Large-flowering Ten-Week—
 „ × × × Aurora (Putz).
- Fuchsia „ Dunrobin Bedder (Melville), seedling from F. Riccar-
 toni, a dwarf, free-flowering, bedding variety.
- Mimulus „ Moschatus compactus (Putz), of dwarf, even growth,
 free flowering, and useful for edging purposes.

GENERAL MEETING.

AUGUST 12, 1890.

GEORGE PAUL, Esq., in the Chair.

ELECTIONS.

Fellows, 27.—W. A. Allen, E. Barber, C. W. Bowdler-Bell, A. Bruce-Joy, G. Cottman, Miss E. G. Crossman, Miss S. M. Crossman, James Dixon, J. Downing, Hy. Eckford, T. Ellis, T. W. Forrest, P. N. Fraser, W. H. Harvey, J. H. Haywood, F. Hill, H. B. Hudson, Dr. R. Lake, J. L. McCabe, Mrs. Pollock, J. Reynolds, Rev. E. Savory, Rich. Silver, N. M. Smith, E. Webb, J. S. Whall, Rich. Worsley.

Mr. E. W. Badger, F.R.H.S., communicated a paper on “Fruit-drying by Evaporation, as practised in America.”

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Kelway & Son, Langport, Somerset, for a fine collection of Gladioli (cut spikes).

To Messrs. Paul & Son, Cheshunt, for a beautiful collection of cut Roses (very fresh for the season), Phloxes, Carnations, &c.

To Messrs. B. S. Williams & Son, Upper Holloway, for a well-grown group of *Dracænas*, including *D. Miss Glendinning*, which was certificated.

To Messrs. J. Veitch & Sons, Chelsea, for a collection of *Gladioli*, African and French Marigolds, and beautiful Hardy Trees and Shrubs.

Bronze Banksian Medal.

To Messrs. J. Peed & Son, Streatham, for an attractive group of *Gloxinias* in flower.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for a well-flowered group of *Campanula pyramidalis*.

First Class Certificate.

To *Tilia euchlora* (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. A Lime with large deep green, glossy leaves.

To *Sequoia sempervirens alba spica* (votes, unanimous), from Messrs. J. Veitch & Sons. Of slender growth, the points of the shoots creamy white.

To *Dracæna Miss Glendinning* (votes, unanimous), from Messrs. B. S. Williams & Sons, Upper Holloway. A distinct and beautiful variety, having the narrow leaves edged with deep purple.

To *Nepenthes Burkei excellens* (votes, unanimous), from Messrs. J. Veitch & Sons. Pitchers of medium size, mottled bronzy green, the margin rich of a deep bronzy purple.

Award of Merit.

To *Petunia Holborn Blue* (votes, unanimous), from Messrs. James Carter & Co., High Holborn. A single-flowered form; flowers of violet-blue, freely produced.

To *Gladiolus Empress of Germany* (votes, unanimous), from Messrs. Kelway & Son. Flowers ivory-white, veined with rose.

To *Gladiolus Stanley* (votes, unanimous), from Messrs. Kelway & Son. Flowers flesh-colour, veined with rose.

To *Hydrangea hortensis fl. pl.* (votes, 14 for, 1 against), from Messrs. J. Veitch & Sons. A double rose-coloured form, which may be useful for market purposes.

To *Nepenthes Burkei prolifica* (votes, unanimous), from

Messrs. J. Veitch & Sons. Pitchers very freely produced, mottled dull green, with a margin of orange-russet.

To Dahlia (Cactus) Robert Maher (votes, unanimous), from Mr. T. S. Ware, Tottenham. Clear pale yellow, of fine form.

To Verbena Uranie (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley. Large flower, mauvy blue with a white eye.

To Sarracenia Claytonii (votes, unanimous), from N. Clayton, Esq., East Cliff, Lincoln (gardener, Mr. A. Wipf). A distinct form, the summits of the pitchers finely coloured with vinous-purple shading to crimson.

To Hypericum oblongifolium (votes, 13 for, 2 against), from Messrs. Paul & Son. Flowers yellow, and very freely produced.

To Picotee Mrs. Walford (votes, unanimous), from Mr. C. Turner, Slough. Yellow ground, crimson flakes on a white edge.

To Picotee Countess of Jersey (votes, unanimous), from Mr. C. Turner. Yellow ground, with a rose edge.

Cultural Commendation.

To Messrs. James Carter & Co. for a very fine spike of *Hedychium Gardnerianum*.

Other Exhibits.

Messrs. James Veitch & Sons sent flowers of beautiful hybrid Greenhouse Rhododendrons, and good "strains" of African and French Marigolds.

From the Royal Gardens, Kew, came a group of plants and cut flowers, including *Chironia palustris*, *C. pedunculata*, *Lobelia Tupa*, *Streptocarpus Watsoni*, and many other hybrid or seedling forms.

Mr. R. Dean, Ealing, sent flowers of a showy strain of giant African Marigolds.

Messrs. J. Cheal & Sons, Crawley, sent a beautiful collection of Cactus, Bouquet, and Single Dahlias.

Messrs. H. Cannell & Sons sent fine cut blooms of Begonias and Verbenas.

Messrs. Hurst & Son, 152 Houndsditch, sent flowers of new hybrid double Annual Chrysanthemums.

From the Society's Gardens were sent cut flowers of Carnations and Ivy-leaved Pelargoniums, and plants in flower of white, rose, and blue *Brachycomas*, *Arnebia cornuta*, and *Torenia Bailloni*, *Fournieri*, and White Wings.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., in the Chair, and seven members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Seeger & Tropp, orchid importers, 112 Lordship Lane, East Dulwich, for a splendid stand of *Satyriums* in flower. They were chiefly white and pink forms of *S. carneum*, and of the showy yellow *S. coriifolium* (exhibited under one of its old names, *S. erectum*). The tubers were potted into small pots in spring, and placed in a cold frame, from which,



FIG. 42.—MASDEVALLIA LOWII.

when warm weather came, the lights were removed, and in this manner they bloomed perfectly.

First Class Certificate.

To *Masdevallia Lowii** (votes, unanimous), from Sydney

* We are indebted to the editor of the *Gardeners' Chronicle* for the figure of this species.

Courtauld, Esq., Bocking Place, Braintree (gardener, Mr. A. Wright). This is a very distinct species from the Cauca, U.S. Columbia. It is of the *M. Chimæra* section, its chief peculiarities being the equal size of the sepals and the small labellum. Its flowers are white, profusely spotted with purple.

To *Saccolabium Hendersonianum* (votes, unanimous), from Major Mason, The Firs, Warwick. An elegant species, with upright spikes of carmine-pink flowers; the labellum white. It is a native of Borneo.

To *Sobralia Warszewiczii* (votes, 5 for, none against), from Messrs. James Veitch & Sons. A fine dwarf species with flowers equal in size to those of *S. dichotoma*, but of a more purple tint.

To *Cypripedium* H. Ballantine \times (votes, 5 for, none against), from Messrs. James Veitch & Sons. This is the result of crossing *C. purpuratum* and *C. Fairieanum*. The dorsal sepal bears evidence in its purple lines on a white ground of *C. purpuratum*, but in some respects it resembles *C. vexillarium* \times .

Botanical Certificate.

To *Phalænopsis Micholitzii* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. It has ivory-white flowers, the sepals slightly tinged with green, and both flowers and leaves bear a resemblance to *P. tetraspis*, but in the present species the sepals and petals are broader, and the whole flower larger.

Other Exhibits.

Messrs. F. Sander & Co., St. Albans, exhibited *Cattleya Schofieldiana*, *C. Dowiana*, several forms of *C. Gaskelliana*, one with about twenty flowers; *Angræcum articulatum*, and *Cattleya Nilssoni*, of the habit of *C. bicolor*, and with evidence of that species in the labellum, but the flowers were of the colour of those of *C. Harrisoniæ*. Messrs. Sander also staged a new *Masdevallia*—*M. hybrida Amesiana*, stated to be the result of crossing *M. Veitchiana* and *M. Tovarensis*.

Messrs. B. S. Williams & Son, Upper Holloway, showed good specimens of *Cypripedium tonsum*, *C. grande*, *C. Ashburtonia superbum*, *C. cœnanthum*, and the pretty white and crimson *Pachystoma Thomsonianum*.

Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr.

Cullimore), sent a form of *Lælia elegans* with five flowers, and a plant of *Cypripedium superbians* with all the flowers having abnormal labellums.

Mr. H. J. Rogers, Fern Bank Nursery, staged *Cypripedium callosum* under the name *C. reflexum*.

F. Wigan, Esq., Clare Lawn, East Sheen (gardener, Mr. Young), staged a fine specimen of *Oncidium Lanceanum*, well grown and flowered.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. James Veitch & Sons, Chelsea, for a very fine collection of Gooseberries, Currants, and early Apples.

Silver Banksian Medal.

To Messrs. T. Burton & Son, Erith Road, Bexley, for eight boxes of splendid Peaches, the principal varieties being Osprey, Princess of Wales, Sea Eagle, and Albatross.

To Messrs. Paul & Son, Cheshunt, for a good collection of fifty varieties of Gooseberries.

First Class Certificate.

To Cucumber Express, from W. S. Mortimer, Rowledge, Farnham, Surrey. The result of a cross between Purley Park Hero and Tender and True; even, handsome fruit.

Cultural Commendation.

To the Duke of Northumberland, Syon House (gardener, Mr. G. Wythes), for fine fruits of a variety of *Musa*, grown on plants from suckers planted in September last.

Other Exhibits.

Mr. T. T. Macgregor, Great Waltham, Chelmsford, sent a new Tomato bearing large bunches of fruit of medium size.

Mr. A. Lancaster, Holkham, Norfolk, sent two large and handsome fruits of a very pale green-fleshed Melon named Holkham Hybrid, grown and ripened without fire-heat.

Mr. W. Roupell, Harvey Lodge, Roupell Park, S.W., sent very creditable examples of Apples Irish Peach, Mr. Gladstone, Peter the Great, and Red Joanetting.

The Duke of Northumberland, Albury Park, Guildford (gardener, Mr. C. W. Leach), sent fruits of a Raspberry named "12th August."

Mr. A. Waterman, Alyesford, Kent, sent five pods of "Preston Hall" Scarlet Runner. The Committee recommended that the variety be tried at Chiswick, along with other sorts.

From the Society's Gardens was sent an interesting collection of twenty-seven varieties of Tomatoes in clusters as grown.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and six members present.

Carnations and Tipula.—With reference to the diseased Carnations, after a further and careful investigation by Mr. Blandford, he thinks that the Tipulæ were not the cause of the mischief, but "interlopers." He considers the state of the plants as more probably indicating the work of an anthomyid fly, but cannot speak positively on the point as yet.

Phylloxera.—A report was received from Mr. Barron that the instructions of the Scientific Committee had been carried out at Chiswick with a view to the destruction of the Vines infected. Mr. McLachlan observed that when the same treatment had been followed elsewhere a few years ago it had proved perfectly effectual, no trace of the disease having appeared since in the same locality.

Distribution of Plants from Chiswick.—To guard against the possible extension of Phylloxera, it was determined by the Council that no plants of any kind, nor Vine-cuttings, should be issued from Chiswick for the present.

Tomatoes diseased.—Specimens of the fruit attacked by Cladosporium and Phytophthora were received from Chiswick. They will be forwarded to Dr. Marshall Ward for examination and report.

Vine Shoots atrophied.—Mr. Morris called attention to the fact that this, at present, obscure complaint is by no means uncommon. It occurs in other gardens in the neighbourhood of Chiswick, and is regarded by cultivators as very injurious indeed. If it affects the primary shoot in the early stage of growth; it apparently renders the Vine utterly barren. It is suspected as being due to some fungus. It is in the hands of Professor Ward for examination.

The Potato Disease.—The following interesting communication was received from Mr. J. Wright, who records the fact that the immense advantage of high moulding was known so long as twenty-five or more years ago in Lincolnshire. He says: "I first saw it in full and systematic operation in most of the cottage gardens at Appleby, in Lincolnshire. The seed tubers were placed a yard asunder on the surface, and mounded over. When growth appeared they were mounded again, and when the haulm had a tendency to fall down, three or four of the best stems (the weakest being pulled out) were gently bent down, the early leaves not being smothered, and spread equidistantly, and then 'crowned' with soil. This 'crowning' was repeated at intervals till no more soil could be dug from between the mounds. The object of the cultivator was to get a peck of tubers (21 lbs.) from a mound. I have had 18 lbs., 19 lbs., and 20 lbs., but never 21 lbs. I have known practically the whole of the mound crops sound when those on the level were worthless, for the results of this system were far in advance of crops on the level in 'bad disease' years. With the introduction of strong, upright-growing sorts the mound system fell into disuse. I have known several plants in the middle of a Potato-bed tied upright to sticks and kept so, so that the early-formed leaves remain exposed to the light and air. These not only yielded more than twice the bulk of tubers of the surrounding procumbent plants, but the former were sound when dug, while the latter were rotten. This was in a wet and 'great disease' year. I remember once seeing water standing between the rows in a Potato-field because it could not pass through the hard 'sole' or 'pan' made with the plough. I took a fork and broke up the pan over a rod of ground, and the water rushed away. In no other part of the field were the Potatoes worth digging. With regard to varieties, short-topped Potatoes were the favourites in former days for late

or winter use and pig-feeding, but the weak-stemmed and foliaged sorts were annihilated by the murrain, only the more robust and coarser surviving, and only one that could in any measure be relied on had stout woody stems that remained upright, with large thick leaves. It was known as the 'Old London Red.' The quality, however, of the tubers was inferior, and Sutton's Red-skinned Flourball was an improvement of great value in those days. Ever since varieties of the same upright growth and strong leaf-power have proved to be the best disease-resisters, and, fortunately, the tubers of several of these are now of good quality. Tender-stemmed late-growing varieties which fall and cover the ground not only prevent evaporation from the soil, but lose all their best leaves prematurely through want of light and air, the weaker leaves towards the tops of the stems alone remaining (as long as they can) to exhale moisture and carry on the other functions of plant life. For this reason such plants fail to withstand the fungus, which readily takes possession."

Mr. Henslow drew attention to the recommendation of his father (the late Prof. J. S. Henslow) to save the starch from Potatoes which might be so far decayed as to be useless as an article of food, for 75 per cent. of starch can often be recovered from such tubers. Several Suffolk farmers followed his suggestion in 1845, when whole fields were utterly destroyed by the disease. Mr. Henslow would be glad to describe the method to anyone who will communicate with him at Drayton House, Ealing.

Stylidium graminifolium.—Mr. Morris called attention to a plant exhibited, a native of Australia. It is well known for the peculiarity of its irritable style. This is at first bent to one side, but when touched at the base suddenly flings itself over to the opposite side of the flower. A similar movement is observable in *Maranta*, a plant allied to the Ginger.

Cypripedium superbians.—A plant was exhibited by Malcolm S. Cooke, Esq., of Kingston Hill, of this Orchid, remarkable for having three flowers, two of which bore double labella, while the third was twin-petalled. Dr. Masters observed that the number of malformed blossoms of Orchids which he had received was on the increase; many occurring on *C. Sedeni*, they being always late flowers which are malformed, according to Mr. Veitch's experience. *C. Lawrenceanum* is another which affords many

monstrous conditions. Dr. Masters raised the question whether it might not be in many cases an indirect result of hybridisation. *C. superbiens* originated from a single plant accidentally included in a batch of Orchids, and, though usually regarded as a distinct species, may possibly be (as Mr. Veitch suggested) a natural hybrid.

Agapanthus umbellatus malformed.—Mr. Wilson showed a flowering scape with the superficial tissue “ripped up,” as it were, at various places along the edge of the somewhat flattened stem. It appeared to be due to an irregularity in the rates of growth of the tissues, so that the superficial layers had become ruptured at places, and curled outwards.

Jeffersonia diphylla, Fruit of.—Mr. Wilson exhibited a specimen of the fruit of this Berberidaceous plant. It consists of a single carpel or “follicle,” but instead of dehiscing down the ventral suture, as in Aconite, it bursts by a semi-circumscissile dehiscence, the lid remaining attached at one, the ventral side. In most cases of “pyxis” the lid is quite separate, as in Henbane, Plantains, and Anagallis. As the fruit is at right angles to the stalk, it has an extraordinary resemblance to a miniature pipe.

Daffodil Bulbs with Merodon.—Mr. Wilks exhibited bulbs of double *Telamonius* with the grubs of *Merodon esquestre* within them. They destroy the interior of the bulb, but their presence brings about a proliferation, as an immense quantity of bulbils are produced, which would not otherwise be the case. Hence they may be regarded as useful for the purpose of multiplication, though of course accompanied by the destruction of the flower which the original bulb would have borne. It appears that the grub descends into the ground in autumn to form the chrysalis, the imago escaping in the following spring. Hence the best period for examination of bulbs, in order to destroy the grub, would be July.

Gloxinia Leaves diseased.—Leaves covered on the under side with light brown spots and patches were received from Buckskin Hall, Herts. It was first suggested that overwatering, especially with cold water, might have been the cause, as this is apt to produce similar injuries; but a microscopic examination revealed thrips and acari, which, it was thought, was no doubt the real cause of the mischief; consequently it should be treated, as usual, with tobacco powder.

Haastia pulvinus, Hk. f.—A fine specimen of this remarkable composite was exhibited by Mr. Richards, obtained by him from Mount Perceval, Amwin, at an elevation of 5,000 feet. It forms dense masses of agglomerated woolly capitula with yellow florets.

GENERAL MEETING.

AUGUST 26, 1890.

Dr. MASTERS, F.R.S., in the Chair.

ELECTIONS.

Fellows, 10.—T. M. Bulkeley-Owen, J.P., Robert Calcutt, Mrs. E. A. Freeling, Mrs. James Kingsford, Langlois Lefroy, George McLeod, E. M. Mundy, Philip Southby, J. H. Telfer, W. Withers.

A paper on "Hollyhocks" was read by Mr. James Douglas.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. Kelway & Son, The Nurseries, Langport, Somerset, for a remarkably fine collection of Gladioli (cut spikes).

Silver Banksian Medal.

To Messrs. J. Cheal & Sons, The Nurseries, Crawley, for a large and beautifully fresh collection of Dahlias, representing the single, cactus, and pompon sections.

To Messrs. J. Veitch & Sons, Chelsea, for a collection of cut branches of hardy ornamental shrubs, especially noticeable being *Stephanandra flexuosa*, several richly coloured *Acers*, *Cornus sibirica* *Spathii*, &c.

To Messrs. Paul & Son, Old Nurseries, Cheshunt, for a beautiful collection of herbaceous flowers, conspicuous being

various Delphiniums, Senecio pulcher, Montbretia crocsmæflora, Shirley Poppies, Helianthus (in variety), Phloxes, &c.

First Class Certificate.

To Geranium Wallichianum Shirley Blue (votes, unanimous), from Rev. W. Wilks, Shirley. Flowers of a pale Nemophylla blue, with a white eye. The plant appeared in Mr. Wilks' garden as a stray seedling, and was at first supposed to be a hybrid, but was afterwards found to be a variety of Wallichianum.

Award of Merit.

To Phlox Le Soleil (votes, 6 for, 3 against), from Messrs. Paul & Son. Flowers pinkish rose, with white eye.

To Potentilla formosa pallida (votes, 7 for), from Messrs. Paul & Son. Flowers soft flesh-pink.

To Dahlia (Show) Canary Bird (votes, 8 for), from Mr. G. S. P. Harris, Orpington. Flowers bright yellow, of good form.

To Dahlia (Cactus) Mrs. Douglas (votes, 9 for), from Messrs. H. Cannell & Sons. Flowers lilac-crimson flushed with buff.

To Dahlia (Single) Maud (votes, 9 for), from Mr. T. S. Ware, Tottenham. Flowers white, with rich crimson margin.

To Dahlia (Single) Eclipse (votes, 7 for, 2 against), from Messrs. J. Cheal & Sons. Flowers magenta-mauve.

To Dahlia (Single) Northern Star (votes, 7 for), from Messrs. J. Cheal & Sons. Flowers red-brown, with yellow margin.

To Dahlia (Cactus) Mrs. Stanley (votes, 5 for, 4 against), from Mr. J. T. West, Cornwalls, Brentwood. Flowers bright rosy-crimson.

To Dahlia (Pompon) Rouge Chauvrière (votes, 4 for), from Messrs. Kelway & Son. Flowers creamy-white.

To Pentstemon Le Borda (votes, 4 for), from Messrs. Kelway & Son. Flowers large, claret-coloured.

To Gladiolus Baron Schröder (votes, 4 for), from Messrs. Kelway & Son. Flowers brilliant scarlet, of fine form.

To Mentzelea bartonioides (votes, 6 for, 2 against), from the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes). A pretty Mexican annual, with clear yellow flowers of good size.

Other Exhibits.

Messrs. H. Low & Son, The Nurseries, Clapton, sent fine flowers of *Lilium Wallichianum superbum* and *L. nepalense*.

Rev. H. H. D'Ombraïn, Westwell Vicarage, Ashford, sent beautiful cut spikes of *Gladioli*.

Mr. R. Dean, Ealing, sent flowers of a good strain of African Marigolds.

Messrs. F. T. Smith & Co. and Messrs. Stuart & Mein, Kelso, each sent fine Hollyhocks (cut blooms).

Mr. H. Herbst, Kew Road, Richmond, sent cut flowers of "Marguerite" Carnations, from seed sown on March 2. A pretty, useful strain.

FRUIT COMMITTEE.

T. F. RIVERS, Esq., in the Chair, and thirteen members present.

Awards Recommended:—*Bronze Banksian Medal.*

To Lord Wimborne, Canford Manor, Dorset (gardener, Mr. T. H. Crasp), for a collection of well-grown Apples, chiefly culinary varieties.

Cultural Commendation.

To Lord Suffield, Gunton Park, Norwich (gardener, Mr. W. Allan), for excellent examples of Gros Maroc Grape, grafted on Frankenthal, the flavour being much improved. Also for good examples of Mrs. Pearson Grape.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for fine fruits of Peaches Sea Eagle and Princess of Wales.

Other Exhibits.

Lord Suffield sent a large Seedling Grape, a cross between Muscat of Alexandria and Black Morocco. This was not quite ripe, so the Committee requested to see it again.

Lord Suffield also sent examples of Strawberry La Grosse Sucrée, second crop; fruit gathered from plants which had been forced and planted out in the early summer.

Mr. F. Taylor, Farnborough, Kent, sent some fine examples of Apple Lady Sudeley.

Mr. T. Bones, Tower House, Chiswick, sent Tomato Tower House Favourite; of good form, &c., but not superior to other varieties in cultivation.

Messrs. J. Carter & Co., High Holborn, sent examples of Tomatoes Blenheim Orange and Market Favourite, which were over-ripe.

Mr. Ridley, Staines, sent a Seedling Potato, which was referred to Chiswick for trial.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., in the Chair, and seven members present.

Awards Recommended:—

Silver Banksian Medal.

To Messrs. Hugh Low & Co., Clapton, for a fine stand of *Vanda Kimballiana* in flower.

First Class Certificate.

To *Cattleya Massaiana* (votes, unanimous), from E. G. Wrigley, Esq., Howick House, Preston (gardener, Mr. G. Beddoes). This is one of the numerous fine varieties intermediate between *C. Warscewiczii* (gigas) and *C. Dowiana aurea*. It is like a *C. aurea*, with sepals and petals marbled with rose colour, and is near to the form described in the *Gardeners' Chronicle* from the Right Hon. Lord Rothschild's collection as *C. aurea marmorata*.

Award of Merit.

To *Cattleya Hardyana*, Wilson's variety, from Alfred Wilson, Esq., Westbrook, Sheffield (gardener, Mr. Pidgley). This differs from the original *Hardyana* in being of a lighter colour, the labellum having a decided purple hue.

To *Lælio-Cattleya Proserpine* × (votes, unanimous), from Messrs. James Veitch & Sons. The plant resulted from crossing *Lælia Dayana* with pollen of *Cattleya velutina*. In features and colour the plant followed closely the seed-bearing parent,

but its lip partakes much of the expanded front lobe of *C. velutina*.

To *Cypripedium* Arthur \times (*C. venustum* \times *lævigatum*), from Drewett O. Drewett, Esq., Riding-Mill-on-Tyne (gardener, Mr. Keeling). This is a pretty variety, resembling *C. venustum*, but with the petals elongated and twisted.

Other Exhibits.

Malcolm S. Cooke, Esq., Kingston Hill (gardener, Mr. Cullimore), exhibited three varieties of *Lælia elegans*, that known as "Cooke's variety" having previously received a First Class Certificate.

Mrs. Whitbourn, Great Gearies, Ilford, exhibited *Cypripedium* Numa \times (*Stonei* \times *Lawrenceanum*).

Drewett O. Drewett, Esq., Riding-Mill-on-Tyne, staged *Cypripedium* Alice \times (*Stonei* crossed with *Spicerianum*) and *C. Constance* \times (*Curtisii* \times *Stonei*); both pretty.

Messrs. James Veitch & Sons sent the true *Lælia grandis*, *Cypripedium* H. Ballantine, *Cattleya velutina*, and *Lælia Dayana*, to illustrate their new cross resulting from them—*Lælio-Cattleya Proserpine* \times .

His Grace the Duke of Northumberland, Syon House, Brentford (gardener, Mr. George Wythes), staged several forms of *Satyrium carneum*.

Specimens of *Cattleya Dowiana aurea*, *C. Hardyana*, and *C. Warscewiczii* (*gigas*) were sent by E. G. Wrigley, Esq., Howick House, Preston (gardener, Mr. G. Beddoes).

Major Mawood, Whitby, Yorkshire (gardener, Mr. Horner), submitted *C. Mawoodi* \times (*C. niveum* \times *C. Harrisianum*). The plant was not strong, and the Committee desired to see it again.

GENERAL MEETING.

SEPT. 9, 1890.

The Rev. H. H. D'OMBRAIN in the Chair.

ELECTIONS.

Fellows, 6.—W. Herbert Fowler, Captain W. W. Knight, Harry Renton Mein, D. Radclyffe, Captain John Ramsay, Charles Herton Woods.

Papers were read on "Hardy Hybrid Gladioli," by Mons. Emil Lemoine and Mr. James Kelway.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Messrs. Kelway & Son, Langport, for a remarkably fine collection of Gladioli, numbering 200 spikes of fine form and beautiful variety of colour.

Silver Banksian Medal.

To Mons. Lemoine, Nancy, France, for a most interesting collection of hybrid Gladioli (cut spikes).

To Messrs. Paul & Son, Cheshunt, for a very interesting collection of hardy flowering and foliage Trees and Shrubs.

Bronze Banksian Medal.

To Messrs. H. Cannell & Sons, Swanley, for an attractive series of Dahlias—Cactus and decorative varieties (cut blooms).

First Class Certificate.

To Gladiolus Lemoinei Nuée bleue (votes, unanimous), from Mons. Lemoine. Flowers pale purplish blue, very distinct in colour.

Award of Merit.

To Gladiolus Lemoinei Rev. W. Wilks (votes, unanimous), from Mons. Lemoine. Flowers rich bright orange-scarlet.

To Gladiolus nanceianus Le Grande Carnot (votes, 14 for, 1 against), from M. Lemoine. Large flowers of a bright carmine colour.

To Gladiolus Lemoinei E. V. Hallock (votes, 13 for, 2 against), from M. Lemoine. Flowers creamy white, throat yellow, blotched with rich crimson.

To Gladiolus Lemoinei Louis Thibaut (votes, unanimous), from M. Lemoine. Flowers violet and maroon-purple.

To Dahlia (decorative) laciniata aurea (votes, 13 for, 2 against), from Messrs. H. Cannell & Sons.

To Dahlia (Cactus), Dr. Peters (votes, unanimous), from Messrs. H. Cannell & Sons. Flowers bright orange-crimson, tipped with gold.

To Dahlia (Cactus) Cannell's Favourite (votes, unanimous), from Messrs. H. Cannell & Sons. Flowers golden buff, shaded with deep orange in the centre.

To Dahlia (decorative) Maid of Kent (votes, 14 for, 1 against), from Messrs. H. Cannell & Sons. Flowers rich deep crimson tipped with white.

To Godetia Duke of Fife (votes, 11 for, 4 against), from Messrs. Daniels Bros., Norwich. Flowers bright crimson, freely produced.

To Dahlia (Cactus) Black Prince (votes, unanimous), from Mr. J. Green, The Nursery, Dereham, Norfolk. Flowers deep shining maroon, almost black.

To Dahlia (Show) Lorina (votes, unanimous), from Mr. C. Turner, Slough. Flowers bright buff, of fine form.

To Dahlia (Pompon) Midget (votes, unanimous), from Mr. C. Turner. Flowers puce and white.

To Dahlia (Pompon) Rubens (votes, unanimous), Mr. C. Turner. Flowers crimson, deeply edged with white.

To Dahlia (Pompon) Crimson Beauty (votes, unanimous), from Mr. C. Turner. Flowers brilliant crimson, of pretty shape.

To Dianthus Caryophyllus Marguerite (votes, unanimous), from Messrs. J. Veitch & Sons, Chelsea. A strain of dwarf and very free-flowering Carnations. Flowers red, rose, orange, salmon, and white.

To Montbretia crocosmæflora aurea maculata (votes, unanimous), from Mr. J. O'Brien, Harrow-on-the-Hill. Flowers bright orange, with deep crimson blotch.

Other Exhibits.

Messrs. Watkins & Simpson, Strand, sent a well-flowered plant of *Lilium longiflorum japonicum giganteum*.

Mr. T. S. Ware sent *Papaver orientale semiplena*; large bright scarlet flowers.

Messrs. Stuart & Mein, Kelso, sent cut specimens of three varieties of Pentstemons.

FRUIT COMMITTEE.

JOHN LEE, Esq., in the Chair, and twelve members present.

Awards Recommended:—

Silver Banksian Medal.

To Mr. J. Walker, Ham Common, Surrey, for a collection of well-grown Apples, the most noticeable varieties being Lord Grosvenor, Ecklinville Seedling, Cox's Orange Pippin, and Colonel Vaughan.

Award of Merit.

To Seedling Melon Ely's Seedling, from Mr. S. Eley, Henley-on-Thames. A good, sweet, green-fleshed variety.

Cultural Commendation.

To Lord Wimborne, Canford Manor, Dorset (gardener, Mr. T. H. Crasp), for an excellent collection of fruit, consisting of Apples, Pears, Figs, &c.

To Mr. A. Selby, Radcliffe-on-Trent, for six dishes of handsome Potatoes.

Other Exhibits.

Rev. W. Wilks, Shirley Vicarage, Croydon, sent a new Pear named Marguerite Marillat, which, not being ripe, was requested to be submitted again.

Messrs. H. Cannell & Sons, Swanley, sent Melon Little Heath Improved, which was passed.

Messrs. James Carter & Co., High Holborn, sent Tomato Market Favourite, and Melon Carter's Holborn Favourite; the latter—a very large handsome fruit, not quite ripe—was requested to be sent again.

Mr. R. Maher, Yattendon Court, Newbury, sent examples of two Seedling Grapes, which the Committee desired to see again.

Messrs. Paul & Son, Cheshunt, sent a collection of Nuts.

P. Crowley, Esq., Waddon House, Croydon, sent ripe fruit of the Kei Apple (*Aberia Caffra*), from Mount Aber, Abyssinia. Fruit somewhat resembling an Apricot.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., in the Chair, and ten members present.

Awards Recommended :—

Silver Banksian Medal.

To Sir Trevor Lawrence, Bart., M.P. (gardener, Mr. White), for a pan of several plants of the beautiful *Habenaria militaris* in bloom. The plants bore dense heads of soft cinnabar-scarlet flowers.

First Class Certificate.

To *Cattleya aurea* Statteriana (votes, unanimous), sent by Thomas Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. R. Johnson). A beautiful form with almost wholly bright yellow flowers, the only other colour being a marbling of rose on the edge of the lip and a few reddish lines in the throat.

Award of Merit.

To *Lælia elegans*, Stand variety (votes, unanimous), from T. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. Johnson). This is a form near to *L. e. prasiata*, but with sepals and petals not exhibiting so much green colour, and a broader and richer crimson lip.

Cultural Commendation.

To T. Statter, Esq. (gardener, Mr. Johnson), for a large specimen of *Dendrobium aqueum*, Lindl. (*D. album*, Wight). A fine old species with pure white flowers, each over an inch across.

To T. A. Gledstones, Esq., Gunnersbury (gardener, Mr. H. Denison), for a well-grown plant of *Dendrobium formosum* with many flowers.

To Messrs. F. Sander & Co., St. Albans, for a fine specimen of *Miltonia candida superba* with several spikes of bloom.

Other Exhibits.

Messrs. Seeger & Tropp, Lordship Lane, East Dulwich, sent a plant of *Camaridium ochroleucum* (Bot. Reg. x., t. 844). It had one pretty white flower with yellow base to the lip. The genus is very near to *Ornithidium*.

Messrs. F. Sander & Co. staged various *Cattleyas* of the "labiata" section, and the pretty *Lælia monophylla* with two flowers.

The Right Hon. Lord Rothschild, M.P., Tring Park, Tring (gardener, Mr. E. Hill), sent a cut spike of the pure white and fragrant *Cattleya Gaskelliana alba*, which had been previously certificated.

T. A. Gledstanes, Esq., exhibited *Vanda Sanderiana*, and Sir Trevor Lawrence, Bart., M.P., contributed *Cypripedium præstans*, which had been purchased by him under the erroneous synonymy of *C. glanduliferum*.

EXTRACTS FROM THE PROCEEDINGS

OF THE

ROYAL HORTICULTURAL SOCIETY.

FERN CONFERENCE AND EXHIBITION.

JULY 24, 1890.*

THE collection of Ferns, both British and exotic, brought together on this occasion was very extensive, and one of the finest ever seen under one roof, not only in the Gardens at Chiswick, but probably in this or any other country.

For the better examination and comparison of the exhibits, they were divided into six principal classes, viz. :

- (1) British Ferns,
- (2) Hardy Exotic Ferns and varieties,
- (3) Stove and Greenhouse Ferns,
- (4) Selaginellas and Lycopodiums,
- (5) Ferns best adapted for cultivation in rooms, and
- (6) Ferns best adapted for growing in baskets.

The British Ferns, which were subdivided into ten groups, were remarkable for the great variation which existed among the different species and varieties. In this class, E. J. Lowe, Esq., F.R.S., of Shirenewton Hall, Chepstow, exhibited no less than 200 distinct forms, many of them quite new, which had been obtained by hybridisation, a process in connection with the reproduction of Ferns so well described by Mr. Lowe in his paper at p. 505.

C. T. Druery, Esq., F.L.S., Fernholme, 25 Windsor Road, Forest Gate, E., staged about 100 remarkable forms, including some charming feathery-looking Athyria, which he had obtained

* The Editors regret that the Fern Conference Awards do not follow in strict order of date. They should have followed page cxi, but were accidentally misplaced.

simply by careful cultivation; in this way he had produced many widely divergent forms of the same variety.

Messrs. Birkenhead, of Sale, near Manchester, were also contributors to this class, paying particular attention to the varieties which find most favour in commerce.

These three collections, from widely separated parts of the country, were remarkable for the healthy condition of the specimens and their extreme variation, which in many cases, especially among the common Hart's Tongue (*Scolopendrium vulgare*), assumed most grotesque forms. It would be invidious to describe any particular variety where all were so excellent, and perhaps we cannot do better than refer our readers to the two very valuable books on British Ferns published by Dr. Lowe and Mr. Druery, in which the description and history of each form is given. For our present purpose we need only remark that the varieties which found most favour with the Judges are those which received a Certificate of Merit and have their names given below.

In the second class, Messrs. Birkenhead had a collection of hardy North American Ferns. There were several examples of *Cheilanthes*, *Onoclea sensibilis*, *Struthiopteris germanica*, and others equally well known.

The class for Stove and Greenhouse Ferns was a popular one. The chief exhibitors were Messrs. J. Veitch & Sons, Chelsea; Mr. H. B. May, Dyson's Lane, Upper Edmonton; Messrs. Birkenhead; and J. A. Whittard, Esq., Rydal Mount, Streatham Hill.

Messrs. Veitch's collection, containing about 250 species and varieties, was of a most diverse character, and represented most of the popular Ferns cultivated under glass. A conspicuous exhibit was a pan of *Todea* seedlings raised from spores of *T. pellucida ferulacea*, *T. grandipinnula*, *T. superba*, *T. plumosa*, mixed together, each of which retained its characteristic distinctions. *Thyrsopteris elegans*, an exceedingly rare Fern, was exhibited by Messrs. Veitch, and was very attractive on account of its graceful, finely cut fronds. *Lomarias* were also well represented, the most notable being *L. gibba*, *L. platyptera*—a hybrid between *L. gibba* and *Blechnum brasiliense*—and *L. L'Herminieri*, a dwarf species from tropical America. Maidenhair Ferns (*Adiantums*) were naturally in great abundance, and being perhaps better known

than any other class of Ferns, were much admired by the visitors. The forms of *A. cuneatum* were extremely numerous, and many of them were remarkable for their clusters of delicate fronds. The Hare's-foot Ferns (*Davallias*) were well represented. These Ferns, which have, for the most part, fronds very finely cut and gracefully drooping, are very ornamental when suspended in baskets or trained up the stems of such Tree Ferns as *Dicksonia* or *Cyathea*. *Gymnogrammes*—popularly known as Gold and Silver Ferns—were a source of considerable attraction, and were extensively staged, not only by Messrs. Veitch, but also by Messrs. Birkenhead and Mr. H. B. May. *Gymnogramme schizophylla* var. *gloriosa* is a remarkably pretty Fern, and is of great value for basket decoration, in which class it was placed, with many others, according to the schedule.

H. J. Whittard, Esq., exhibited a grand bank of plants, principally greenhouse varieties, the most striking amongst them being *Platycerium grande*, *P. alcicorne*, and *P. Hillii*, commonly known as Stag's-horn Ferns, the specimens shown being the finest we ever remember to have seen.

Mention should also be made of those delicate Cryptogams known as Filmy Ferns, represented by the genera *Trichomanes*, *Hymenophyllum*, and *Todea*. Messrs. Birkenhead had a splendid collection of these, of which indeed they make a speciality. Among the many varieties noticeable were good specimens of the "Killarney Fern" (*Trichomanes radicans*), and several strong-growing varieties of it; *T. reniforme*, having great clusters of fronds, which, as the specific name implies, are kidney-shaped in outline; *T. alatum*, *crispum*, *pinnatum*, *pyxidiferum*, *tenerum*, *trichoideum*, *venosum*, &c.; the Tunbridge Fern (*Hymenophyllum tunbridgense*), *Todea superba*, *T. pellucida*, *T. grandipinnula*, &c.

Awards Recommended :—

The *Silver Challenge Cup* presented to the Society by N. N. Sherwood, Esq., was awarded to E. J. Lowe, Esq., F.R.S., Shirenewton Hall, Chepstow, for the best collection of Hardy Ferns.

Gold Knightian Medal.

To Messrs. W. & J. Birkenhead, Sale, Manchester, for a group of Ferns.

To Messrs. J. Veitch & Sons, Chelsea, for a group of Ferns.

Silver-Gilt Flora Medal.

To Mr. H. B. May, Upper Edmonton, for a group of Ferns.

To C. T. Druery, Esq., F.L.S., 25 Windsor Road, Forest Gate, for a group of Ferns.

Silver Flora Medal.

To J. A. Whittard, Esq., Rydal Mount, Streatham Hill, for a group of Ferns.

Certificate of Merit.

To *Adiantum Capillus-veneris* var. *autumnale*, from E. J. Lowe, Esq., F.R.S.

To *Adiantum manuatatum*, from Messrs. W. & J. Birkenhead.

To *Aspidium aculeatum* vars. *hybridum* and *Nepos*, *pulcherrimum*, and *Abbottæ*, from E. J. Lowe, Esq., F.R.S.

To *Aspidium angulare* vars. *plumosum foliosum*, *polydactylum variegatum*, *latifolium grandiceps*, *remoto-decurrans*, *divisilobum plumosum*, *flabelli-pinnulum*, *decompositum frondosum*, *plumosum*, *plumosum plumosissimum*, *plumosum coronare*, and *divisilobum plumosum imbricatum*, from E. J. Lowe, Esq., F.R.S.

To *Aspidium angulare divisilobum plumosum Baldwini*, from J. L. Baldwin, Esq.

To *Asplenium filix-fœmina* vars. *cruciatum columnare*, *calo-melanos*, *Victoriæ gracile*, *uncum cruciatum*, *cristatum magnificum*, and *grandiceps coronare*, from E. J. Lowe, Esq., F.R.S.

To *Athyrium filix-fœmina* vars. *setigerum percristatum* and *Frizilliæ coronare*, from Messrs. W. & J. Birkenhead.

To *Athyrium filix-fœmina* vars. *stellatum angustatum*, *percristatum* J. S. Cousens, and *plumosum superbum*, from C. T. Druery, Esq., F.L.S.

To *Blechnum spicant* vars. *ramo-cristatum*, *concinnum*, and *plumosum* (Airey), from C. T. Druery, Esq., F.L.S.

To *Dicksonia Lathamii* ×, from Mr. W. B. Latham, Botanic Gardens, Birmingham.

To *Gymnogramma chrysophylla* var. *grandiceps superba*, from Mr. H. B. May.

To *Lastrea montana* var. *cristata gracile*, from C. T. Druery, Esq., F.L.S.

To *Nephrodium paleaceum* vars. *pendens* and *cristatum*

globosum; also *N. spinulosum* var. *spectabile*, from E. J. Lowe, Esq., F.R.S.

To *Polystichum angulare* var. *pulcherrimum* (Wills), from C. T. Druery, Esq., F.L.S.

To *Pteris serrulata cristata parvula*, from Messrs. J. Veitch & Sons.

To *Pteris aquilina depauperata grandiceps pendens*, from Messrs. W. & J. Birkenhead.

To *Scolopendrium vulgare* var. *crispum* (Wills), from C. T. Druery, Esq., F.L.S.

To *Scolopendrium vulgare* vars. *undulatum synthesina*, *undulatum muricato-spirale*, *reflexum*, *grandiceps*, *Cowburnii*, *robustum*, *augustum*, *variegatum aureolum*, *luminare*, *projectum princeps*, *capitatum*, *periferens rosetta*, *inæquale cristatum pericalles*, and *ramosum Alexandræ*, from E. J. Lowe, Esq., F.R.S.

To *Scolopendrium vulgare* vars. *crispum fimbriatum lutescens*, *grandiceps fimbriatum*, and *crispum fimbriatum cristatum*, from Messrs. H. Stansfield & Co.

To *Todea pellucida ferulacea*, from Messrs. J. Veitch & Sons.

To *Trichomanes radicans* var. *crispum cristatum*, from E. J. Lowe, Esq., F.R.S.

DAHLIA CONFERENCE AND EXHIBITION.

SEPTEMBER 23, 1890.

THE collection of Dahlias brought together for the Conference was very extensive, and occupied a large tent. The blooms were, on the whole, very fine, and, for the sake of comparison, were divided into five groups, in accordance with the terms of the schedule, viz. Show Dahlias, Fancy Dahlias, Cactus or Decorative Dahlias, Single Dahlias, and Pompon Dahlias. This mode of arrangement proved to be very effective, although single varieties were not in such abundance as the others.

Messrs. Keynes, Williams & Co., Salisbury, had a fine collection, consisting of twenty-four Fancy varieties, twelve bunches of Cactus and Decorative kinds, and twenty-four bunches of Pompoms.

Mr. Charles Turner, Slough, had one hundred and fifty-six Show and Fancy Dahlias mixed, twenty-four bunches of Cactus and Decorative kinds, and the same number of Pompons, the whole presenting a charming sight.

Messrs. Paul & Son, The Old Nurseries, Cheshunt, contributed a collection remarkable for the number of fine Single varieties, besides large and well-arranged bunches of the other kinds.

Messrs. Laing & Sons, Forest Hill, had a remarkable collection of Single varieties, as well as Show and Fancy kinds, mixed, and a large group of Pompons.

Messrs. J. Cheal & Sons, Lowfield Nurseries, Crawley, had also a striking exhibit of Single, Decorative, Pompon, Show and Fancy varieties.

Messrs. H. Cannell & Sons, Swanley, contributed fifty bunches of Cactus and Decorative Dahlias, among them being many new varieties hitherto unknown to commerce.

Messrs. Rawlings Bros., Romford, had an interesting collection of Show and Fancy Dahlias, consisting chiefly of varieties raised during recent years.

Mr. T. S. Ware, Hale Farm Nursery, Tottenham, had a good collection of the different varieties.

Messrs. Dobbie & Co., Rothesay, N.B., notwithstanding the great distance, contributed a large collection, well representing the Show, Fancy, and Pompon types.

Among the amateurs, Mr. J. T. West, gardener to W. Keith, Esq., Cornwallis, Brentwood, had a group of Dahlias, consisting of forty-eight Show, twenty-four Fancy, six bunches of Cactus, and twelve of Pompon varieties.

In the class reserved for seedlings, and for new and miscellaneous varieties, Mr. George Phippen, Victoria Nurseries, Reading, made a unique and very effective display. The Cactus and Decorative Dahlias were arranged in fan-shaped bouquets, and placed upon the ground on upright stands of various heights, the background being decorated with Ferns and Palms. Mr. George Humphries, Kington Langley, Cheltenham, had a group consisting of many fine varieties, as had also Messrs. Saltmarsh & Sons, Chelmsford; Messrs. Heath & Son, Cheltenham; Mr. J. T. Tranter, Henley-on-Thames; Mr. W. Salmon, West Norwood; and Messrs. J. Peed & Sons, Norwood Road, S.E.

Awards Recommended for Dahlias:—*Silver-Gilt Banksian Medal.*

To Messrs. Paul & Son; Messrs. J. Laing & Sons; Messrs. J. Cheal & Sons; Messrs. Keynes, Williams & Co.; and Mr. C. Turner.

Silver Flora Medal.

To Mr. George Phippen; Messrs. Rawlings Bros.; Mr. J. T. West; Mr. T. S. Ware; and Messrs. H. Cannell & Sons.

Silver Banksian Medal.

To Messrs. Dobbie & Co.; Mr. George Humphries; Messrs. Saltmarsh & Son; and Messrs. Heath & Son.

Bronze Banksian Medal.

Mr. J. Tranter; Mr. W. Salmon; and Messrs. J. Peed & Sons.

Certificate of Merit.

To Eldorado (Show) and Mikado (Pompon), from Mr. Charles Turner.

To Comedian (Fancy) and Phœbe (Pompon), from Messrs. Keynes, Williams & Co.

To Beauty of Arundel (Cactus) and Centennial (Decorative), from Messrs. J. Cheal & Sons.

To Melita (Pompon Cactus), from Mr. T. S. Ware.

To Yellow A. W. Tait (Decorative), from Messrs. H. Cannell & Sons.

To Daisy (Pompon), from Mr. J. T. West.

GRAPE CONFERENCE AND EXHIBITION.

SEPTEMBER 24, 1890.

THE Exhibition of Grapes was not so large as could have been desired, and comparatively few of the smaller-berried kinds were shown. One feature of the exhibition, however, attracted much attention, namely, the manner in which Grapes were packed for market. The methods of packing were various, some of the exhibitors using shallow baskets technically known as "flats"

(fig. 43), others what are known as "handle baskets" (fig. 44). Mr. George Monro, of Covent Garden, contributed many samples, exactly as they had been sent to him, from the Channel Islands, containing some remarkably fine Grapes, which bore no sign of ill effects from their long journey. There was a class for Grapes sent in small quantities either by rail or parcels post, but transit by the latter means seemed to be a failure, owing to the mutilated condition of the Grapes on arrival. It is unnecessary to describe here the various modes of packing Grapes, as that is fully done in Mr. Coleman's paper (see vol. xiii. p. 59).

Particular attention was attracted by the collection of small-berried Chasselas and Frontignan Grapes from plants grown in pots by W. Roupell, Esq., Harvey Lodge, Roupell Park. The varieties included the American Raspberry and the Strawberry, Chasselas Musqué, Chasselas de Fontainebleau, Muscat of Hungary, Muscat Troveren, &c.

Messrs. T. Rivers & Son, Sawbridgeworth, had a collection of eighteen varieties, among them a new one named San Antonio—a black oval-berried Grape of promising appearance and fair quality.

S. W. Graystone, Esq., Hurst Side, West Moulsey (gardener, Mr. A. G. Hookings), exhibited fine bunches of Gros Colmar and Gros Maroc, as well as of Black Alicante.

Messrs. J. Peed & Sons, Norwood Road, S.E., sent some bunches of Gros Maroc and Black Alicante.

The Rev. W. Sneyd, Keele Hall, Staffs. (gardener, Mr. J. Wallis), exhibited eighteen varieties, which had, however, unfortunately been somewhat injured by the long railway journey.

T. Barnes, Esq., The Quinta, Chirk (gardener, Mr. J. Loudon), sent some fine specimens of Alicante and Black Hamburgh, as well as Muscat Champion and Muscat of Alexandria.

Numerous other well-known kinds were shown by various exhibitors, and most of them were remarkable for their fine size and flavour.

A promising new white Grape with Muscat flavour was sent from the Marchioness of Downshire, Hillsborough Castle, Ireland (gardener, Mr. Bradshaw), which may probably prove a very valuable addition to late-keeping high-flavoured Grapes.

In the class for "high-flavoured" Grapes, Mr. J. Clarke, Albion Nursery, Farnham, sent some bunches of Muscat of

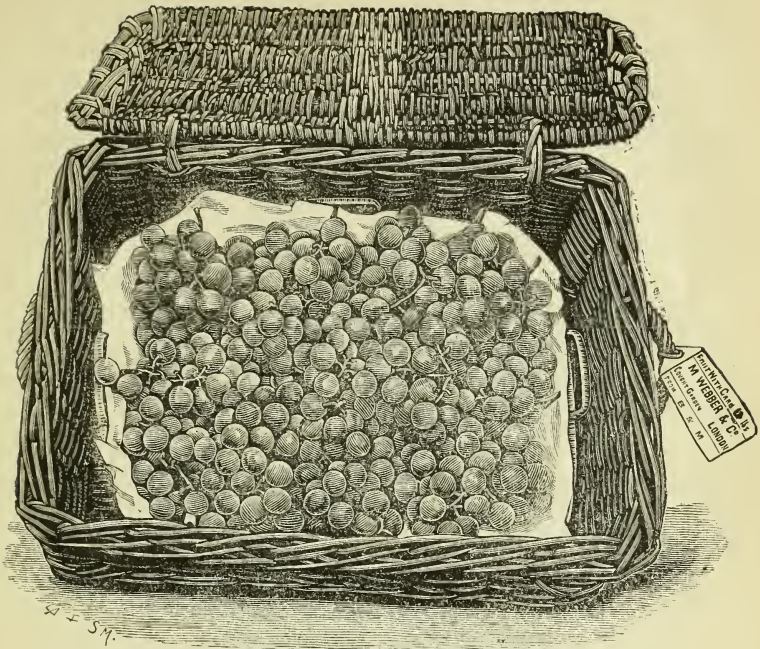


FIG. 43.—FLAT. (From Mr. Barron's work on the Vine.)

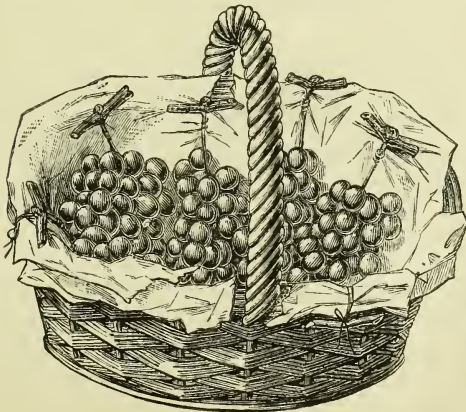


FIG. 44.-- HANDLE BASKET. (From the *Gardeners' Chronicle*.)

Alexandria and Madresfield Court. He also sent bunches of Grapes which had been grown under glass but without artificial heat, among this group being Madresfield Court, Gros Colmar, Gros Maroc, Lady Downes, &c.

Some specimens of the Vine-moth (*Tortrix angustiorana*) (fig. 45) were exhibited. This pest is of comparatively recent

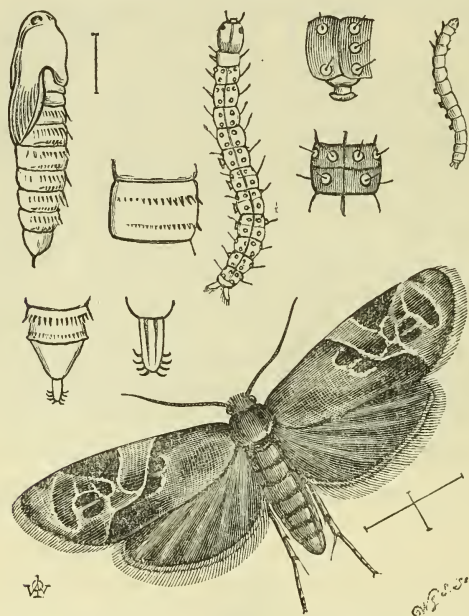


FIG. 45.—*TORTRIX ANGUSTIORANA*. (From the *Gardeners' Chronicle*.)

appearance in this country, although well known on the Continent. The caterpillar first eats the skin of the berries, and then envelops the latter in a webbed net.

Awards Recommended for Grapes :—

The *Silver-Gilt Cup* presented to the Society by D. Morris, Esq., F.L.S., was awarded to Mr. R. Dawes, Temple Newsam, Leeds, for examples of packing Grapes for private use.

Silver-Gilt Banksian Medal.

To W. Roupell, Esq.; Mr. P. Kay.

Silver Banksian Medal.

To Messrs. T. Rivers & Son ; Mr. St. Clair ; Mr. J. Sweet ; Messrs. Parrott Bros. ; Mr. A. G. Hookings ; Mr. J. Clarke.

Certificate of Merit.

To Black Monukka, from H. Balderson, Esq., and the Society's Gardens.

To Canon Hall Muscat, from W. Roupell, Esq.

To Muscat of Alexandria, from Mr. G. Wythes.

To Muscat Hamburgh and Alnwick Seedling, from the Society's Gardens.

To Gros Colmar and Gros Maroc, from Mr. A. G. Hookings.

To Muscat of Alexandria, Muscat Champion, Alicante, and Black Hamburgh, from Mr. J. Louden.

For a collection of Frontignan Grapes, from Messrs. T. Rivers & Son.

For a collection of Grapes, from Mr. J. Wallis.

For packing Grapes, Mr. S. Castle, Mr. J. Hudson, and Mr. C. J. Waite.

FLORAL AND ORCHID COMMITTEES.**MEETING AT CHISWICK.**

SEPTEMBER 23, 1890.

W. MARSHALL, Esq., in the Chair, and eighteen members present.

Awards Recommended:—*Silver Gilt Banksian Medal.*

To Messrs. J. Laing & Sons, Forest Hill, for an excellent group of Begonias in flower. Plants of dwarf habit, producing flowers very freely.

Silver Banksian Medal.

To Messrs. Harkness & Sons, Bedale, Yorks, for a beautiful group of hardy flowers, consisting of bold masses of *Doronicum*, *Helianthus*, *Tigridia*, &c.

To Messrs. H. Cannell & Sons, Swanley, for fine groups of double- and single-flowered varieties of Begonias, lifted from the open ground.

Bronze Banksian Medal.

To Messrs. Reid & Bornemann, Sydenham, for a good group of Early-flowering Chrysanthemums.

Award of Merit.

To Chrysanthemum (Pompon) Miss Lilly Stevens (votes, 13 for), from Mr. G. Stevens, The Nursery, Putney. Pretty, small white flowers, very freely produced.

To *Lælia Eyermaniana* (votes, unanimous), from Messrs. Pitcher & Manda, The United States Nursery, Hextable, Swanley. It had a peduncle bearing four pretty rose-coloured flowers, which in construction resemble *L. majalis* and *L. autumnalis*.

Other Exhibits.

Mr. J. O'Brien, Harrow-on-the-Hill, sent *Oxalis imbricata* fl. pl. (fig. 46). Exceedingly pretty, producing rich rose-coloured flowers, deepening to a more intense shade in the centre.

Mr. C. B. Powell, Southborough, Tunbridge Wells, sent the scarce white form of *Crinum Powellii* named album. Mr. Powell also showed spikes of varieties of *Gladiolus* (*Lemoinei*), which had been produced in five months from seed.

Messrs. J. Veitch & Sons, Chelsea, sent *Gynerium argenteum aureo-variegatum*. The Committee expressed a desire to see larger plants.

A. H. Smee, Esq., The Grange, Wallington (gardener, Mr. G. W. Cummins), sent the old and pretty *Eucomis punctata*.

Mrs. Sherard Clay, Comyns Hill, Ilfracombe (gardener, Mr. J. Dadds), sent a very fine specimen of *Adiantum Daddsi*; also *A. variegatum*, a seedling from *A. cuneatum*.

Messrs. J. Laing & Sons, Forest Hill, sent two well-flowered plants of *Chrysanthemum Mrs. Alpheus Hardy*.

Messrs. J. Veitch & Sons, Chelsea, sent beautiful cut flowers of Javanese *Rhododendrons*, and several flowering shrubs, particularly noticeable being *Abelia rupestris*, producing delicate pink flowers,

Subsequently the Committee examined the collections of Dahlias growing in the Garden (sent for trial). Three marks (×××), signifying "meritorious in the first degree," were given to each of the following varieties, viz. :—

Cactus vars.—*Honoria*, *Panthea*, *Juarezi*, *Empress of India*, *A. W. Tait*, and *Mrs. Hawkins* from Messrs. Keynes, Williams

& Co.; Juarezi from Mr. C. Turner; Mrs. Hawkins, Henry Patrick, Charming Bride, and Lady Kerrison from Mr. T. S. Ware.



FIG. 46.—OXALIS IMBRICATA FL. PL. (From the *Gardeners' Chronicle*.)

Pompon vars.—Darkness, Brunette, Millie Wood, Fairy Tales, Whisper, Mdle. V. Faconet, Gem, Red Indian, The Khedive,

Janet, Rosetta, Rosalie, Lady Blanche, E. F. Junker, White Aster, Fashion, Isabel, and Mabel from Messrs. Keynes, Williams & Co.; Ernest, Isabel, Fanny Weiner, Anna Zachman, Dove, Princess Sophie Sofiela, Cupid, Lady Jane, Admiration, and E. F. Junker from Mr. C. Turner.

Single vars.—Miss Linaker, The Sport, Sunningdale White, Mr. Kennett, Alfonso, Lady Monckton, Cetewayo, and Formosa from Messrs. J. Cheal & Sons; Florrie Fisher, Miss Henshaw, and Kate from Mr. T. S. Ware.

Bedding vars.—Yellow Pet, Marguerite Bruant, and Flora Macdonald from Mr. C. Turner.

Show vars.—Condor, J. B. Service, George Rawlings, Ovid, Mrs. Gladstone, Cyprus, Royalty, Primrose Dame, Leah, Goldfinder, Royal Queen, Diadem, Toison d'Or, Mrs. Glasscock, Statesman, Mrs. Harrison, and Pioneer from Mr. C. Turner.

Fancy vars.—Grand Sultan, Queen Mab, and General Gordon from Mr. C. Turner.

FRUIT COMMITTEE.

JOHN LEE, Esq., in the Chair, and fifteen members present.

Awards Recommended:—

Cultural Commendation.

To Mr. R. Dean, Ranelagh Road, Ealing, for very fine examples of The Conference Tomato.

Other Exhibits.

The Marchioness of Downshire, Hillsborough Castle, Co. Down (gardener, Mr. T. Bradshaw), sent Grape Lady Downshire, a large, white, oval variety resembling White Tokay, Examples of this Grape were also exhibited, stated to have been grafted on Black Hamburgh, having smaller and somewhat rounder berries. This Grape, unfortunately, did not arrive until after the Committee had separated.

Mr. Myles, Appley Towers, Ryde, sent examples of Grape Appley Towers, which had previously been certificated by the Committee. Mr. Myles also sent examples of another seedling Grape of the same character.

Rev. W. Wilks, Shirley, again sent Pear Marguerite Marillat, which was now, however, found over-ripe.

Mr. W. Palmer, Thames Ditton, sent a good fruit of Melon Hero of Lockinge.

Mr. R. Maher, Yattendon Court, Newbury, sent fruit of a scarlet-fleshed Melon named Red Gauntlet, which was not ripe.

Messrs. Keynes, Williams & Co., Salisbury, sent a seedling Apple named Chorister Boy.

Mr. L. Castle, Merton, sent Apple Marie's Pippin, which was requested to be sent again.

The Baroness Burdett-Coutts, Holly Lodge, Highgate (gardener, Mr. J. Willard), sent nice examples of Grape Stillward's Sweetwater.

Mr. Jardine, Ravelston, Blackhall, Midlothian, sent examples of a Grape supposed to be Foster's Seedling, but the Committee were unable to identify it.

MEETING AT CHISWICK.

OCTOBER 2, 1890.

JOHN LEE, Esq., in the Chair, and eight members present.

The Committee examined the new varieties of Potatos grown in the Garden, when the following varieties—on account of their appearance and good cropping—were selected to be cooked, viz. :

“Victory,” Lye.	“Lye's Perfection,” Lye.
“Governor,” Dean.	“The Amateur,” Maher.
“Reliance,” Ridgewell.	“Capital,” Ross.
“Sharpe's Standard,” Sharpe & Co.	“The Times,” Ross.
“Ellington's Prolific,” Ellington.	“Stanley,” Barrows.
“Market Favourite,” Ellington.	“Aplin's Success,” Aplin.
	“The Poor Man's Friend,” Maher.

When boiled they were, however, all found to be deficient in quality—possibly on account of the previous wet season.

GENERAL MEETING.

OCTOBER 14, 1890.

JOHN T. BENNETT-POË, Esq., in the Chair.

ELECTIONS.

Fellows, 31.—T. Adams, R. Armour, T. P. R. Bradshaw, J. Brooking-Rowe, E. Clapham, J. H. Clibran, J. Cocksedge, G. W. Dalton, Rev. Dr. Dangar, H. Fincham, E. Fison, Rob. Fyfe, T. A. Gledstanes, S. W. Graystone, T. Jefferys, Rev. R. V. Kinleside, J. H. Lane, W. L. Lewis, A. J. Manda, Lady D. Neville, Mrs. Newall, W. Paice, M.A., G. L. Palmer, Hy. Power, H. W. Pownall, W. H. Preston, A. Rudder, C. Tuffin, Sir Jas. Whitehead, R. Yeats, S. Yoshida (of Tokio, Japan).

A paper on "Crinums" was read by Sir Chas. Strickland, Bart.

FLORAL COMMITTEE.

JOHN FRASER, Esq., in the Chair, and twelve members present.

Awards Recommended:—

Silver Gilt Banksian Medal.

To Mr. H. B. May, Edmonton, for an effective group of small Crotons, Palms, and Ferns, in good variety—the Crotons being particularly well-coloured.

Silver Banksian Medal.

To Messrs. Wm. Paul & Son, Waltham Cross, for a beautiful collection of cut Roses, from the open, the most noticeable varieties being W. A. Richardson, The Bride, Mrs. J. Laing, Ella Gordon, Madame Hoste, and Marie Van Houtte.

To E. Mawley, Esq., Rose Bank, Berkhamstead, for a charming arrangement of cut flowers, comprising Tea Roses, Tuberous Begonias, and Chrysanthemums.

To Mr. H. J. Jones, Lewisham, for a well-grown collection of Early-flowering Chrysanthemums.

Bronze Banksian Medal.

To Mr. C. Turner, Slough, for an excellent collection of Show Dahlias. Flowers fresh and in beautiful variety.

Award of Merit.

To *Richardia æthiopica* Little Gem (votes, unanimous), from

Mr. H. Elliott, Jersey. Flowers quite white and small ; useful for decorative purposes.

To *Bouvardia Purity* (votes, unanimous), from Mr. H. B. May, bearing dense heads of pure white flowers ; habit of plant compact.



FIG. 47.—*CUNILLA MARYANA*. (From the *Journal of Horticulture*.)

To *Carex* species (votes, 3 for), from Mr. J. Robson, Altrincham. A graceful, narrow-leaved form. Award made subject to name being given by the Scientific Committee.

To *Cunilla Maryana* (votes, unanimous), from Messrs. Pitcher & Manda, Hextable, Swanley, bearing dense racemes of small lilac flowers ; plant about a foot in height (fig. 47).

To *Chrysanthemum Pink Lacroix* (votes, unanimous), from

Mr. T. S. Ware, Tottenham, and Mr. H. J. Jones. A useful early-flowering, light pink-coloured variety.

Other Exhibits.

Messrs. J. Veitch & Sons sent beautiful blooms of their pretty Greenhouse hybrid Javanese Rhododendrons.

Mr. G. Fry, Lewisham, sent *Fuchsia triphylla alba carminata*, which the Committee requested to see again in a larger form.

T. B. Haywood, Esq., Woodhatch Lodge, Reigate (gardener, Mr. C. J. Salter), sent flowers of Japanese *Chrysanthemum Memoir*, a sport from H. Wellam.

ORCHID COMMITTEE.

H. J. VEITCH, Esq., in the Chair, and seven members present.

Awards Recommended:—

Silver Flora Medal.

To Baron H. Schröder (gardener, Mr. Ballantine), for a select group of Orchids, including a magnificent plant of the rare *Cypripedium Fairieanum* carrying seven flowers; three plants of the large form of *Dendrobium Phalænopsis*; *Cattleya Fausta* ×; *C. aurea* *Imschootiana*, and *Lælia porphyrites*.

First Class Certificate.

To *Cattleya aurea Imschootiana* (votes, unanimous), from Baron Schröder, The Dell, Egham. This is a form of *C. aurea* approaching *C. Hardyana*, but with nearly white sepals and petals.

To *Cattleya Warocqueana* var. *amethystina* (votes, unanimous), from M. Linden, l'Horticulture Internationale, Parc Léopold, Brussels, by whom this noble and distinct form of *C. labiata* was introduced. It appears to be an importation from the same ground from which the famed "autumn-flowering *labiata*" came in 1818, and which has hitherto been sought in vain. The plant exhibited was a true autumn-flowering *labiata*, but with brighter sepals and petals, and more showy lip.

To *C. Warocqueana flammea* (votes, unanimous), a variety resembling the preceding, but with only a bright wedge-like mark of crimson on the lip.

Award of Merit.

To *Cattleya aurea Lindenii* (votes, 3 for), from M. Linden, Parc Léopold, Brussels. This is a noble form of the well-known

C. Dowiana aurea, the difference being in its larger golden-yellow sepals and petals, and the peculiar plum-coloured blotch at each side of the base of the labellum.

To *Cattleya du Buyssoniana* (votes, unanimous), from M. Linden, of Brussels. This is the nearest approach to an "Albino" in the *C. granulosa* section. The flowers are five inches across; sepals and petals cream colour, or the colour of old ivory; lip amethyst-red, with obscure yellow marks in the centre.

To *Catasetum Burgerothii* var. *Randii* (votes, unanimous), from M. Linden, Brussels. A yellow form of the type, said to have been collected in a new locality.

Botanical Certificate.

To *Dendrobium* (*Bulbophyllum*) *amplum* (votes, unanimous), from Sir Trevor Lawrence, Bart., M.P. A most extraordinary and rare plant, with large yellow and chocolate-coloured flowers.

To *Angræcum Kimballianum* (votes, unanimous), from W. Vanner, Esq., Chislehurst. This has sprays of white, fragrant flowers, and can only be regarded as a form of *A. polystachyum*, figured as *Epidendrum polystachyum* in the work of Aubert du Petit Thonars on the Orchids of West Africa.

Cultural Commendation.

To a fine specimen of *Odontoglossum grande*, from Mr. Alfred Sanders, 146 Camden Road, N.W.

To *Odontoglossum Londesboroughianum* and *Lælia Perrinii*, from Mr. James Crispin, Fishponds, Bristol.

Other Exhibits.

M. Linden exhibited various forms of the new *Cattleya Warocqueana*—all beautiful; also *Aganisia cyanea*, *Lælia grandis vera*, and *Mormodes maculata*.

Sir Trevor Lawrence, Bart., M.P., sent *Epidendrum radiatum fucatum*, which may be considered the highest form of the *E. fragrans* section.

Messrs. Pitcher & Manda, The United States Nurseries, Hextable, Swanley, staged their *Lælia Arnoldiana*.

Captain Hincks, Brechenborough, Thirsk, sent a flower of

his Masdevallia Stella—M. Estradæ × M. Harryana—which the Committee desired to see again.

W. C. Atkinson, Esq., Aigburth, Liverpool, sent a spike of *Vanda cœrulea*.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and eighteen members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. William Paul & Son, Waltham Cross, for a very fine collection of the principal varieties of Apples and well-fruited shoots of October Red and White Raspberries.

To Messrs. Gaymer & Son, Attleborough, Norfolk, for an interesting collection of Apples—varieties grown for the manufacture of Cider, samples of which were also shown.

First Class Certificate.

To Melon Westley Hall (votes, 9 for, 3 against), from R. Burrell, Esq., Westley Hall, Bury St. Edmunds (gardener, Mr. A. Bishop). Scarlet-fleshed, tender, and of rich flavour.

To Apple Beauty of Stoke (votes, unanimous), from Lord Savile, Rufford Abbey, Ollerton, Notts (gardener, Mr. R. Doe). Sir Charles Strickland and Mr. A. H. Pearson, to whom the fruit was referred when shown in December last, reported very favourably as to quality and cropping. Fruit large, solid, conical, of a uniform green russet, somewhat resembling Alfriston.

Cultural Commendation.

To the Messrs. de Rothschild, Gunnersbury House, Acton (gardener, Mr. J. Hudson), for very fine examples of Golden Noble Apple.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for fine fruits of *Monstera deliciosa*; also for fruits of a large red Banana, afterwards identified by the Scientific Committee as *Musa sapientum* var. *paradisiaca*.

Other Exhibits.

H. Balderson, Esq., Corner Hall, Hemel Hempstead, sent a dish of fine fruit of D. T. Fish Apple, with the object of deter-

mining its identity with Warner's King, or otherwise. It was unanimously declared to be identical with Warner's King.

Mr. Lewis Castle, Merton, sent Apple Duc d'Aumale, a large, firm fruit, with a distinct aromatic flavour, but it was considered rather dry.

Messrs. Jarman & Co., Chard, sent a small collection of Apples.

Mr. R. Fenn, Sulhamstead, Reading, sent fruits of a medium-sized Apple named "Pay-the-Rent"; also a collection of different kinds of Fruit and Nuts, and Home-made Wines.

Mr. Roffey, Croydon, sent fine seedling fruits of his selected Telegraph Cucumber.

Mr. A. Dean, Bedfont, Feltham, sent interesting examples of jam and syrup preparations of Tomato, Carrot, Vegetable Marrow, and Beetroot, the first and last named finding the most favour with a majority of the members present.

PRESERVED FRUIT EXHIBITION.

At this meeting an Exhibition of Jams, and of Dried, Preserved, and Bottled Fruits, was held, which attracted considerable interest. The judges in the various classes were Mrs. Dunsford and Miss Gibbs of the School of Cookery, and D. Morris, Esq., M.A., F.L.S., who recommended the following awards:—

Silver Knightian Medal.

To Messrs. T. W. Beach & Sons, Ealing Road, Brentford, for Jams and Bottled Fruits.

Bronze Knightian Medal.

To Messrs. S. Chivers & Son, Cambridge, and to Mr. D. MacGregor, Edinburgh, for Preserved Fruits and Jams.

Certificate of Merit.

To Mr. D. MacGregor for Candied Orange and Lemon Peel.

To Mr. Austin for Mulberry and Apple Jams.

To the Mid-Kent Fruit Factory for Quince Marmalade, Quince Jelly, and Black Currant Jam.

To Mrs. Fenn, Sulhamstead, for Strawberry Jam.

To W. Roupell, Esq., Roupell Park, for Muscat Grape Jam.

Highly Commended.

Preserves from Mr. J. E. Austin, Kingston-on-Thames, and the Mid-Kent Fruit Factory, Tonbridge.

Commended.

Preserves from Sir Chas. W. Strickland, Bart., Hildenley, Malton, and Mr. Edmunds, Liverpool Road, N.

Honourable Mention.

Dried Fruits, Syrups, Sweets, &c., from Messrs. J. Veitch & Sons, Chelsea.

This Exhibition brought to light some peculiar fruit and vegetable compounds. Mr. A. Dean, of Bedfont, succeeded in making very excellent and palatable preserves from such material as Tomatoes, Carrots, Marrows, and Beetroot.

Mrs. Fenn, of Sulhamstead, sent some fine Strawberry Jam, as well as some made from Apples mixed with Mulberries, Blackberries, &c.

Sir Chas. Strickland, Bart., contributed wild Strawberry and Blackberry Jams.

Mrs. Shore, of Newington Green Road, sent Blackberry Jam and Orange Marmalade, which created some interest; and Lady Susan Byng, Sherborne House, Gloucester, had fine Jams made of Apricots and Red Currants.

An interesting exhibit in the way of Grape Jam was sent by W. Roupell, Esq. It was made from Muscat of Alexandria Grapes, and had a good flavour.

The contribution of Messrs. James Veitch & Sons, Chelsea, attracted general attention and was full of interest. It consisted of Syrups; Preserved, Candied, and Dried Fruits; Sweets, &c., imported from Turkey, and gave one a good idea of the tastes (which, to judge from the exhibits, were very numerous) of the inhabitants of that country. Besides these there was also exhibited a collection of common articles of food sold in the streets of Constantinople. These included St. John's Bread (John the Baptist's Locust), baked and unbaked Pistacio Nuts, American Earth or Butter Nut, Persian Apricots, baked seeds of Pumpkins, Sunflowers, Stone Pines, &c., all more or less used for culinary purposes.

Among the trade exhibits, those of Messrs. Beach & Sons attracted much attention. Most of the fruits preserved were

selected from fine varieties of Plums, Damsons, Raspberries, Black Currants, Green Gooseberries, &c., grown on Lord Sudeley's fruit farms at Toddington, near Cheltenham,

Messrs. Chivers & Son, of Histon, near Cambridge, had a smaller but equally excellent display of similar fruits.

Mr. J. E. Austin, Kingston-on-Thames, had some very clear light-green Jam made of Plums, and also Quince Marmalade having a flavour peculiar to that fruit.

Mr. J. Edmunds, Liverpool Road, N., contributed some excellent foreign preserves, including Mango Chutnee, Tamarinds, and Preserved Mango—the latter being attractive in colour, but somewhat disappointing to the palate. Vanillas, Ripe Mangos, and Guava Jelly were among the remaining exhibits.

Tinned fruits preserved in liquid were sent by Messrs. Ellis, Rislingbury & Co., of St. Mary Axe, and consisted of Spanish grown Cherries, Greengages, and Apricots; while the "Frame Food Co." exhibited some of its "Jelly," said to be a preparation of Wheat phosphates, and recommended by the Company as a substitute for ordinary Jams.

SCIENTIFIC COMMITTEE.

W. T. THISELTON DYER, Esq., C.M.G., F.R.S., in the Chair,
and seven members present.

Plantain Fruit.—Mr. Morris exhibited two large fruits of *Musa sapientum* var. *paradisiaca*, or the common Plantain, grown at Syon House. In the tropics it is generally used as a vegetable before it is quite ripe. It practically takes the place of the Potato, and is a very valuable food, especially in tropical America.

Merulius lachrymans (?).—Dr. Oliver exhibited an interesting specimen of the mycelium of some fungus which had grown between two sheets of canvas. It had spread in a radiating manner, covering a space of about 8 inches square.

Antirrhinum majus, *Monstrous*.—Mr. Henslow showed a flower of the yellow Snapdragon, with narrow ribbon-like yellow and white outgrowths from the calyx. Such emanations are not uncommon from the outer surface of corollas, as in the fringed Cyclamen, Polyanthus, Gloxinia, &c.; but in the present

instance they were detached from the inner surface of the calyx—*i.e.* by tangential chorisism.

The Fog Report.—Dr. Oliver read a report as to the scheme proposed at the preliminary meeting. A discussion followed as to the methods to be adopted, and it was suggested (1) that Dr. Oliver should confer with Mr. Veitch as to the setting up of a pump at Chelsea for collecting fog particles; (2) that the Meteorological Society should be asked to lend a pump already used for the purpose; (3) to consult with Dr. Russell as to the construction of an absorbent apparatus; and (4) that a duplicate chamber with filters should be prepared for use at Kew. It was also proposed to reissue circulars with an additional request as to the opacity of the fogs experienced.

GENERAL MEETING.

OCTOBER 28, 1890.

Sir CHAS. STRICKLAND, Bart., in the Chair.

ELECTIONS.

Fellows, 7.—Rev. S. E. Bourne, B.A., Mrs. Campbell, F. C. Dodsworth, Mrs. H. Hill, G. D. Leslie, Mrs. Murdoch, W. H. Williams.

Dr. Maxwell T. Masters, F.R.S., gave an interesting lecture on "Trees and Shrubs for Large Towns," illustrated by specimens sent by Messrs. W. Paul & Son, of Waltham Cross, and Messrs. Paul & Son, of Cheshunt.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and fourteen members present.

Awards Recommended:—

Silver Banksian Medal.

To Lord Wimborne, Canford Manor, Dorset (gardener, Mr. T. H. Crasp), for a very fine collection of Chrysanthemums (cut blooms).

To Mr. W. Taylor, florist, &c., Twickenham Road, Isleworth, for a beautiful group of Cyclamen, the white ones being especially good.

Bronze Banksian Medal.

To Messrs. W. Paul & Son, Waltham Cross, for an interesting collection of shoots of Hardy Trees and Shrubs suited for town gardening.

To the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for a very good stand of Chrysanthemum blooms—rendered very effective by the introduction of suitable foliage gracefully interspersed amongst the flowers.

To Messrs. H. Cannell & Sons, Swanley, for cut blooms of Chrysanthemums of the various sections.

To Messrs. W. Cutbush & Son, Highgate, for a collection of Pernettyas, beautifully berried.

First Class Certificate.

To *Berberis Thunbergii* (votes, unanimous), from Messrs. W. Paul & Son. A very useful shrub, bearing foliage of an intense crimson colour.

Award of Merit.

To Chrysanthemum (Japanese Anemone) Duchess of Westminster (votes, 6 for, 3 against), from Mr. R. Owen, Maidenhead. Colours crimson and yellow; a graceful flower.

To Chrysanthemum (Japanese) Miss Anna Hartshorn (votes, unanimous), from Mr. R. Owen. Pure white, broad petals.

To Chrysanthemum (Japanese) Eugene Gait (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley. Rich crimson; silvery reverse to the petals.

To Chrysanthemum (Incurved Japanese) W. Tricker (votes, unanimous), from Messrs. H. Cannell & Sons. Bright rose-pink, broad petals.

To Chrysanthemum (Incurved) Miss Violet Tomlin (votes, unanimous), from Messrs. J. Laing & Sons, Forest Hill. Warm violet-purple; very decided and distinct.

To Chrysanthemum (Incurved) Miss M. A. Haggas (votes, unanimous), from Messrs. J. Laing & Sons. Rich yellow.

To Chrysanthemum (Japanese) Vivian Morel (votes, unanimous), from Messrs. J. Laing & Sons. Rich rose, shaded with white.

To Chrysanthemum (Japanese) Mlle. Marie Hoste (votes, unanimous), from Messrs. J. Laing & Sons. Yellow, tinted with blush.

To a strain of Pentstemons (votes, unanimous), from Mr. R. Dean, Ealing. Very rich and varied; colours ranging from the brightest scarlet to violet-purple.

Other Exhibits.

From the Royal Gardens, Kew, was sent an interesting collection of plants, amongst which may be mentioned *Solanum Seaforthianum*, lovely lilac flowers; *Cleome leptaphylla*, rich rose; *Ipomæa Briggsii*, a variety of *I. Horsfalliæ*, bright carmine flowers; and *Spathiphyllum longirostre*, having a remarkably sweetly scented spadix. *Philodendrons*, in variety, formed a beautiful feature.

Lord de L'Isle, Penshurst Place (gardener, Mr. Bridger), sent hardy Border Carnation *Saccharissa*. A useful sort, bearing creamy-yellow flowers, with a pinkish stripe.

The Marchioness of Huntley, Orton Hall (gardener, Mr. A. Harding), sent *Helianthus tuberosus* (Jerusalem Artichoke) in flower.

ORCHID COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and eight members present.

Awards Recommended:—

Silver Flora Medal.

To Mons. Linden, l'Horticulture Internationale, Parc Léopold, Brussels, for a group of Orchids, consisting chiefly of fourteen varieties of their new *Cattleya Warocqueanæ*, which bids fair to be a fine "autumn-flowering labiata," some of the varieties closely approaching the original plant grown in collections under that name.

Award of Merit.

To *Cattleya Lindenii* (votes, unanimous), a new form of the *Cattleya Hardyana* type, very closely resembling the plant certificated at the last meeting as *C. Imschootiana*, but with pale lilac sepals and petals exquisitely veined and netted with white. The lip is of the richest purplish maroon, veined at the base with yellow.

Cultural Commendation.

To Reginald Young, Esq., Fringilla, Linnet Lane, Sefton

Park, Liverpool (gardener, Mr. Poyntz), for three magnificent cut spikes of *Vanda Sanderiana*, all, it was understood, taken from the same plant.

Other Exhibits.

Cut flowers of *Cattleya Warocqueana* came from W. C. Atkinson, Esq., Aigburth, Liverpool; Reginald Young, Esq., Liverpool; and W. T. Thomson, Esq., Ghyllbank, St. Helens, Lancashire, that from Mr. Young having petals mottled with white, and that from Mr. Thomson being almost identical with the old autumn-flowering *labiata*. Mr. A. Coombes, The Gardens, Hindley Hall, Dudley, also sent flowers of the same plant.

A well-grown plant of *Odontoglossum grande*, in flower, was sent by W. J. Nicholls, Esq., 258 Kingsland Road, E.

Messrs. Seeger & Tropp, 112 Lordship Lane, East Dulwich, exhibited a box of cut flowers of various forms of *Lælia Perrinii*, among which the pure white variety, *L. P. alba*, was conspicuous for its beauty.

Mons. Linden also exhibited *Cattleya granulosa Russelliana*.

FRUIT COMMITTEE.

Sir C. W. STRICKLAND, Bart., in the Chair, and eleven members present.

Awards Recommended :—

Cultural Commendation.

To Mr. R. Dean, Bedford, for large and fine examples of Grange's Winter Pearmain Apple and Noveau Poiteau Pear.

Other Exhibits.

W. Nicholson, Esq., Basing Park, Hants (gardener, Mr. W. Smythe), sent a seedling Grape, stated to be a hybrid between Black Alicante and Mrs. Pince. The example bore a great resemblance to Gros Colmar.

Mr. Colbourn, Woolhampton, Berks, sent a few fine ripe fruits of Strawberry Noble, second crop.

Mr. T. Laxton, Bedford, sent some examples of a white-skinned Artichoke, which appeared good. They were referred to be tried as to their cooking qualities. Mr. Laxton also sent

examples of a Cabbage named Chou de Bedford, stated to be very hardy and of excellent quality, but the Committee did not consider it to be any improvement on the Couve Tronchuda.

Messrs. James Carter & Co., High Holborn, sent a very large head of Carter's Early Autumn Giant Cauliflower.

Mr. G. Wythes, Syon House, Brentford, sent examples of Cheltenham Green-top Beet.

Mr. Hunt, Ashtead Park, Surrey, sent Apple Ashtead Park Seedling, a nice-looking variety, but of little quality.

From the Society's Gardens were brought collections of the different varieties of Endives and Potatoes which had been grown in the Gardens for trial.

SCIENTIFIC COMMITTEE.

R. McLACHLAN, Esq., F.R.S., in the Chair, and seven members present.

The Fog Report.—Dr. F. Oliver reported to the Committee that through the kindness of one of its members an experimental conservatory had been placed at his disposal, and was now in process of equipment for the purposes of the inquiry into the effects of London fog upon vegetation. The pump for fog-washing, mentioned at the last meeting, would be put in order and arrangements made for its use directly leave had been obtained from the Council of the Meteorological Society. Dr. Oliver further stated that he was fitting up his own conservatory attached to the botanical laboratories at University College with apparatus of appropriate character, so that he could follow out both the macro- and micro-scopic effects of fog, and also of some of the noxious constituents known to exist in fogs.

Garrya elliptica in Fruit.—Mr. Morris exhibited sprays of the fruit of this North Californian shrub. The berries have a tomentose, ash-coloured, dry skin, and are compactly arranged in a dense spike. They were received from Mr. H. D. Pochin, of Bodnant Hall, Denbighshire, who described it as fruiting well, and that numerous plants have been raised from the seeds. The male plant was introduced in 1828, and first flowered in the gardens of the Royal Horticultural Society in 1834 (*Bot. Reg.* tab. 1686).

Supposed Bigener between Dahlia and Helianthus.—Dr. Scott exhibited flowers received from Mr. E. J. Lowe, of Shirenewton Hall, Chepstow, of white Dahlias, the supposed offspring of a cross between the ordinary single white Dahlia and *Helianthus decapetalus*. The “cross” agrees with the Dahlia in general appearance, and in the involucre, shape of receptacle, paleæ, external characters of the florets, and form of stigmata, but differs as follows: The corolla-tubes of the disk florets, especially the outer ones, are more ventricose; the stamens are shorter; the pollen has blunt and obliquely truncated prickles, and not conical as in the Dahlia; the style also is shorter, the stigmatic arms being less divergent, with shorter papillæ. The above differences do not appear to amount to more than may perhaps be seen on various seedlings of Dahlias. The fruits, however, show more pronounced peculiarities, besides being only one-fourth in quantity. The achenes are smaller, less compressed, much less obovate in form, and have prominent ribs, which are not evident in Dahlias. The achenes are also about half as long. It may be added that neither in the pollen nor in stigmatic character does the “cross” agree with *Helianthus*. Mr. Lowe observes that in a cross it is often difficult to detect the effects of the male parent, and mentions *Fuchsia fulgens* crossed by “Semiramide” and the reverse cross, the seedlings in both cases resembling the female. Other observers have experienced the same fact, or, as Mr. Lowe expresses it, the female parent “received life from the pollen without showing traces of it, the active property of the male seeming to be enough to produce seeds, but not to show the characters of the male.”

Apple Diseased (?).—A remarkable Apple, with a superficially translucent appearance, was received from Mr. Marshall of Bexley. Being possibly due to a fungus, it was forwarded to Professor Ward for examination and report.

Carex Species (?).—A plant was received from Mr. Robson, of Altrincham, for name; not being in flower, it was referred to Chiswick for cultivation.

Grapes attacked by Larvæ.—Some Grapes were received from Mr. Galpin, of Putney Heath, with the supposed larvæ of *Tortrix angustiorana*. Some doubts being expressed by Mr. McLachlan as to their identity, they were referred to Mr. Blandford to rear and to report upon them later.

GENERAL MEETING.

Nov. 11, 1890.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair.

ELECTIONS.

Fellows, 6.—Richard Buckworth, Mrs. T. Chamberlain, A. Ludwig, Edward Moon, W. Spooner, Col. E. Woodward.

Mr. A. W. Sutton, F.L.S., read a paper on "Chinese Primulas."

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and eight members present.

Awards Recommended :—

Silver Banksian Medal.

To Messrs. Sutton & Sons, Reading, for a beautiful group of Primulas, well-flowered, plants barely six months old from seed.

First Class Certificate.

To *Vaccinium pennsylvanicum* (votes, unanimous), from Mr. A. Waterer, Knap Hill, Woking. Crimson-coloured foliage of a neat character, and very ornamental.

To Scarlet-leaved Oak, "Knap Hill variety" (votes, unanimous), from Mr. A. Waterer. Bold foliage of a scarlet-crimson hue, shaded with bronze.

Award of Merit.

To *Chrysanthemum* (Japanese) Arthur Wood (votes, unanimous), from Messrs. H. Cannell & Sons, Swanley. Rich chestnut-brown, tipped with yellow.

Other Exhibits.

His Grace the Duke of Northumberland, Albury Park, Guildford (gardener, Mr. W. C. Leach), sent some good flowers of Violets.

Messrs. H. Cannell & Sons, Swanley, sent a stand of *Chrysanthemum* blooms of various sections.

W. Kaye, Esq., The Court, Worcester Park, Surrey (gardener, Mr. W. Melford), sent a sport from *Chrysanthemum* Gluck in three different colours.

ORCHID COMMITTEE.

H. J. VEITCH, Esq., F.L.S., in the Chair, and eight members present.

Awards Recommended :—

First Class Certificate.

To *Cypripedium Antigone* × (votes, unanimous), from Messrs. Jas. Veitch & Son, King's Road, Chelsea. This fine hybrid was obtained by crossing *C. niveum* and *C. Lawrenceanum*. The lip is creamy white, tinted with purple in front; petals also white with a rose-coloured hue; the dorsal sepal broad; white with green lines at the base, and suffused with a rosy-purple tint.

Award of Merit.

To *Odontoglossum Duvivierianum* (votes, 3 for, 1 against), from M. Linden, l'Horticulture Internationale, Parc Léopold, Brussels. It is stated to be a natural hybrid between *O. cordatum* and *O. nebulosum*, and may be likened to a pale yellow variety of the former; but the whiter ground of the flower and the different form of the lip betray traces of *O. nebulosum*.

To *Cypripedium Doris* (*C. venustum* × Stonei) (votes, unanimous), from Norman C. Cookson, Esq., Wylam-on-Tyne. The plant exhibited resembled a fine form of *C. venustum pardinum*, but its flower was larger in all its parts, and especially the petals, which are broad towards the tips and slightly curved downwards.

To *Cypripedium Cleola* × (*C. Boissierianum* × *C. Schlimii albiflorum*) (votes, unanimous), from Messrs. Jas. Veitch & Son. Both parents are of the *Selenipedium* section, and consequently *C. Cleola* has much of the habit of plant and flower as in the well-known *C. Sedeni* ×. Its flowers are very neat and nearly white.

To *Cypripedium Eyeranianum* × (*C. Spicerianum* × *C. barbatum grandiflorum*) (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. It is a fine form, with white dorsal sepal, bearing traces in the green lines at the base of *C. barbatum*. The lip has the form and also the reddish hue of that species. The petals green, tinged with brown.

To *Cypripedium Muriel Hollington* × (votes, 4 for), from

A. J. Hollington, Esq., Forty Hill, Enfield (gardener, Mr. Ayling). The cross of this is not recorded. Flowers cream-colour tinged with green, the petals being suffused with rose. Probably a *C. niveum* cross.

Botanical Certificate.

To *Odontoglossum Noezlianum* (votes, 5 for, 1 against), from M. Linden, Parc Léopold, Brussels. The species is quite new and distinct. The flowers, which individually measure one and a half inches across, are produced on branched panicles, and are reddish scarlet in colour. The specimen exhibited had not been imported long enough to develop perfectly.

Cultural Commendation.

To T. Statter, Esq., Stand Hall, Whitefield, near Manchester (gardener, Mr. R. Johnson), for a finely flowered plant of *Cattleya aurea*.

To Baron Schröder, The Dell, Egham (gardener, Mr. Ballantine), for a fine spray of the beautifully spotted *Odontoglossum crispum Sanderianum*.

Other Exhibits.

M. Linden, l'Horticulture Internationale, Parc Léopold, Brussels, exhibited for the third time specimens (four) of his new winter-flowering *Cattleya Warocqueana*.

Messrs. F. Sander & Co., St. Albans, staged the pretty pale rose *Cattleya O'Brieniana*, *Cypripedium Laucheanum* ×, and *C. Ashburtoniæ* ×.

T. Statter, Esq., Stand Hall, near Manchester, exhibited several cut spikes of different varieties of *Cattleya Bowringiana*; also *Vanda cœrulea* and two plants of *Dendrobium Statterianum*.

A. J. Hollington, Esq., Forty Hill, Enfield, exhibited *Cypripedium polystigmaticum* ×.

W. C. Atkinson, Esq., St. Anne's Road, Aigburth, Liverpool, sent a cut spike of the true *Lælia anceps alba*.

Messrs. Pitcher & Manda, Hextable, Swanley, again exhibited *Cypripedium Masereelianum* ×, which the Committee before decided was only a good form of *C. Leeaeum* ×.

Baron Schröder sent cut flowers of *Lælio-Cattleya Euterpe*.

FRUIT COMMITTEE.

T. F. RIVERS, Esq., in the Chair, and ten members present.

Awards Recommended :—

Silver Gilt Banksian Medal.

To Messrs. T. Rivers & Son, Sawbridgeworth, for a fine collection of Apples and Pears, the most noteworthy varieties being—Apples : Lane's Prince Albert, Lord Derby, Dumelow's Seedling, and Cox's Pomona. Pears : Duchesse d'Angoulême, Durondeau, Beurré de Capiaumont, and Doyenné du Comice.

Other Exhibits.

Messrs. J. Veitch & Sons, Chelsea, sent Pear Beurré Tonqueray, which was over-ripe, but gave promise of being a decided acquisition.

Colonel Eyre, Welford Park, Newbury (gardener, Mr. C. Ross), sent seedling Apple Charles Ross, which the Committee desired to see again in the spring.

Mr. Jarvis, Essendon Place, Hatfield, sent a seedling Apple, which the Committee considered too closely resembled that already known as "Greenup's Pippin."

A. H. Smee, Esq., The Grange, Wallington (gardener, Mr. G. W. Cummins), sent nice examples of Apple Remborough.

Mr. T. Laxton, Bedford, again submitted examples of the white-skinned Artichoke and Chou de Bedford.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and seven members present.

Grapes attacked by Larvæ.—With reference to the Grapes brought to the last meeting, Mr. Blandford remarked that the larvæ might very probably prove to be those of *Tortrix botrana*. It was a well-known pest on continental Vines, and had been exported to America. He recommended that the Grapes infested should be covered with a fine gauze net, and that the larvæ should be watched to discover their further stages.

Endogenous (?) Bud.—Dr. Masters exhibited a drawing of what appeared to be an endogenous bud in the axil of a leaf of

Actinidia, embedded in the cortical tissue. Dr. Oliver remarked that the buds which arise from the roots of *Anemone japonica* are also endogenous. Similar buds on the roots of germinating plants are well known and described—*e.g.*, by Van Tieghem, *Bull. Soc. de Bot. Fr.* 1886, page 40; Irmisch, *Bot. Zeit.* 1857, page 48, with pl. The interpretation appears to be that in roots the pericycle is the most active layer, and such buds as arise from roots are developed exactly as lateral roots are from this tissue. On the other hand, in stems the pericycle is more often in abeyance, while it is from the cambium from which ordinary buds and adventitious roots arise.

Translucent Apple.—Professor M. Ward reported upon the specimen sent to the last meeting as follows: “The Apple sent for my inspection was affected with a disease known as ‘Glassiness,’ and was totally free from fungi in the interior. The parts affected by this disease are distinguished by the cells being very full of sugar and singularly poor in acids. The intercellular spaces are filled with water, whereas in the healthy parts they contain air. This season, a wet one, has been somewhat prolific in such Apples. A condition not unlike this is produced by frost, and by any changes which cause the intercellular spaces to fill with water.”

Chrysanthemum “Hen and Chicken” Form.—Mr. Gooding, of the Manor House, Hayes, sent a remarkable specimen of a yellow variety with a large circle of small heads springing from the base of the central one. The latter was arrested in its growth, and dead. The florets had a tendency to be pedicellate, especially the outer ones. It is difficult to assign a cause, but possibly it received a check through frost, as no trace of insect attacks was discoverable.

Lycaste Skinneri, Monstrous.—Dr. Masters exhibited drawings of this plant received from M. Linden, of Brussels, in which the flowers were aborted and replaced by petaloid bracts.

Leucadendron argenteum.—He also showed drawings of germinating plants of the Silver Tree of Africa, which showed a curious cavity at the base of cotyledons encircling the plumule.

GENERAL MEETING.

DECEMBER 9, 1890.

GEO. WYTHES, Esq., in the Chair.

ELECTIONS.

Fellows, 12.—G. Gordon, W. H. Gower, John Grant, H. Hainworth, J. R. Jessop, W. Kates, Gustav R. Le Doux, Major H. M. Scriven, John Shaw, jun., J. W. Swinburne, Joseph Woodjer, Geo. Woodward.

Affiliated Societies, 2.—Bath Floral Society, Wellington (New Zealand) Horticultural Society.

FLORAL COMMITTEE.

W. MARSHALL, Esq., in the Chair, and fifteen members present.

DEATH OF MR. SHIRLEY HIBBERD.

The following resolution, proposed by the Chairman and seconded by Mr. Harry J. Veitch, was carried unanimously:—

“That this meeting of the Floral Committee, which has so greatly benefited by the labours of the late Mr. Shirley Hibberd, desires to place on record its deep sense of the loss it has sustained, and of the gratitude and respect it feels towards the memory of the late Mr. Hibberd.”

Awards Recommended:—

Silver Flora Medal.

To Messrs. H. Cannell & Sons, Swanley, for a series of Zonal Pelargoniums (cut blooms). Rich, bright, and beautiful.

Silver Banksian Medal.

To Mr. H. B. May, Upper Edmonton, for a group of Primulas. A good market strain, well flowered.

First Class Certificate.

To *Picea pungens argentea* (votes, unanimous), from Mr. A. Waterer, Knap Hill Nurseries, Woking. Foliage of a beautiful silvery colour; a plant of vigorous growth, bold character, and splendid habit.

Commended.

Patent Tree Pruner (votes, unanimous), from Messrs. G. Coppin & Sons, Addington, Surrey. A simple and effective contrivance for the purpose in view.

Other Exhibits.

His Grace the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), sent blooms of a white-flowered *Chrysanthemum* named Duchess of Northumberland. The Committee expressed a desire to see a plant in flower.

Messrs. Pitcher & Manda, Swanley, sent a plant in flower of *Chrysanthemum* Mrs. Alpheus Hardy.

Mr. A. Waterer sent fine examples of *Picea pungens glauca* and *Cedrus atlantica glauca*, two very handsome Conifers.

A unanimous vote of thanks to the Chairman closed the proceedings for 1890.

ORCHID COMMITTEE.

HARRY J. VEITCH, Esq., F.L.S., in the Chair, and eleven members present.

Awards Recommended:—*First Class Certificate.*

To *Cymbidium Tracyanum* (votes, unanimous), from Mr. H. A. Tracy, Orchid Nurseries, Amyand Park Road, Twickenham. This is the largest flowered of all the *Cymbidiums*, the botanical features resembling those of *C. Hookerianum*, and the colouring that of *C. giganteum*. The plant bore a fine spike of sixteen flowers, each six inches across (see fig. 48).

To *Cypripedium Osbornei* × (*C. Harrisianum superbum* × *C. Spicerianum*) (votes, 9 for, 1 against). The flowers are larger than those of *C. Pitcherianum* ×, which it resembles in many respects. It should be recorded that there are several varieties obtained from the same parentage, and therefore resemble each other in a great degree, viz., *C. Erycina* ×, *C. Pitcherianum* ×, *C. Savageanum*, *C. Seegerianum* ×. The plant certificated was sent by W. Howard, Esq., The Grove, Teddington (gardener, Mr. T. Osborne).

To *Cypripedium Pollettianum* × (*C. calophyllum* × *C. œnanthum superbum*) (votes, 5 for, 3 against), from Messrs. F. Sander &

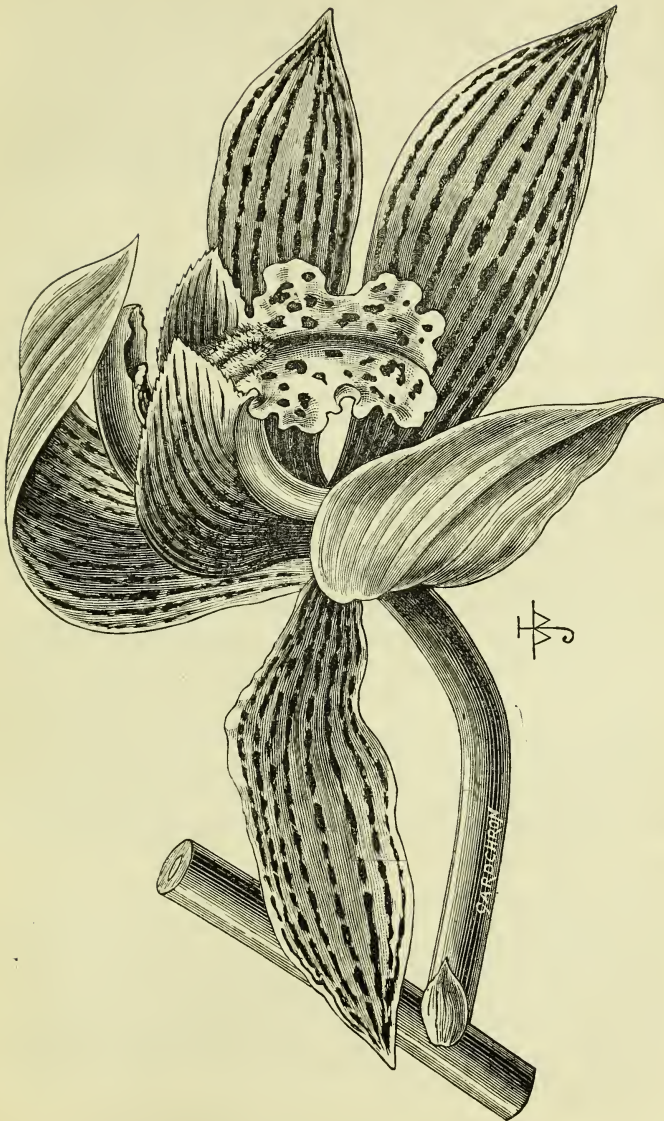


FIG. 48.—CYMBIDIUM TRACYANUM. (From the Gardener's Chronicle.)

Co., St. Albans. This is like an enlarged form of *C. ænanthum superbum*, the same bright rosy crimson being in the dorsal sepal, which also has dark brown lines at the base. The petals much resemble those of *C. calophyllum* ×, and the lip is of a purplish brown.

To *Lælia Gouldiana* (votes, unanimous), from T. Statter, Esq., Stand Hall, Whitefield, Manchester (gardener, Mr. R. Johnson). The species is now well known; its flowers much resemble those of *L. autumnalis atrorubens*.

Award of Merit.

To *Cattleya O'Brieniana* (votes, unanimous), from Messrs. F. Sander & Co., St. Albans. The plant has the growth of a dwarf *C. Loddigesii*, and the flowers, which are of a pale lilac colour, also resemble those of that species in some particulars; but the labellum has the form of *C. Walkeriana*.

To *Lælia Tresederiana* (*L. crispa superba* × *Cattleya Loddigesii*), from T. Statter, Esq., Whitefield, Manchester (gardener, Mr. Johnson). The growth of this plant resembles *Cattleya Loddigesii*, but the flowers call to mind a small *Lælia crispa*. Sepals and petals nearly white; lip yellow, marked with purple lines on the throat, the front lobe being veined and tinged with purple, the edge undulated. (Votes, unanimous.)

To *Cypripedium Maynardii* × (*C. purpuratum* × *Spicerianum*) (votes, 8 for, 1 against), from Messrs. F. Sander & Co., St. Albans. The upper sepal is green at the base, suffused with rosy veins over the lower half, and white at the upper half. The edges are revolute at the base, and a purple line runs up the middle. Petals pale green, spotted with purple at the base, and suffused with purple on the outer halves; lip brownish purple; staminode violet colour.

Cultural Commendation.

To Lieut.-Colonel G. N. Pepper, Milford Hill, Salisbury (gardener, Mr. J. Currey), for a specimen of *Lælia anceps* with thirty flower spikes, bearing together over sixty blooms.

To T. A. Gledstones, Esq., Manor House, Gunnersbury (gardener, Mr. Denison), for a fine specimen of *Cœlogyne barbata* with seven spikes of flowers.

Other Exhibits.

Messrs. James Veitch & Son, King's Road, Chelsea, exhibited

Cypripedium Medeia (*C. Spicerianum* × *hirsutissimum*), and good specimens of their *C. Niobe* × and *C. H. Ballantine* ×, both previously certificated.

Messrs. F. Sander & Co., St. Albans, sent *Cypripedium Castleanum* × (*C. hirsutissimum* × *C. superbiens*); *C. Alcides* (*C. insigne* × *C. hirsutissimum*); *C. Orpheus* × (*C. venustum* × *C. callosum*); *C. Weidlichianum* (*C. Hartwegii* × *C. Schlimii*), and *C. longisepalum*, apparently a very low form of *C. insigne*.

Mr. T. Walters, Squires Mount, Hampstead Heath, exhibited *Oncidium Forbesii Borwickianum* under the name of *O. F. maculatum*.

Mr. James Crispin, Nelson Street, Bristol, submitted a spike of a variety of *Lælia*, which the Committee decided was a small pale form of *L. autumnalis*.

FRUIT COMMITTEE.

R. D. BLACKMORE, Esq., in the Chair, and seventeen members present.

Awards Recommended:—

Bronze Banksian Medal.

To Mr. W. G. Hazell, The Rosery, West Worthing, for a collection of Grapes in excellent condition, the principal varieties being Muscat of Alexandria, Gros Colmar, and Alicante.

First Class Certificate.

To Grape Lady Hutt (votes, unanimous), from Lady Hutt, Appley Towers, Ryde (gardener, Mr. T. Myles). Bunch long, tapering; berries medium sized, round, of a pale amber colour; flesh firm, juicy, and with a rich Sweetwater flavour.

Cultural Commendation.

To Lieut.-Colonel Eyre, Welford Park, Newbury (gardener, Mr. C. Ross), for two handsome, well-ripened Smooth Cayenne Pines, weighing 7 lbs. 12 oz. and 6 lbs. 4 oz. respectively.

To Mr. H. Deverill, Corn Hill, Banbury, for a well-grown collection of Onions, the most noteworthy varieties being Rousham Park Hero, Anglo-Spanish, Ailsa Craig, and Coconut.

To His Grace the Duke of Northumberland, Syon House, Brentford (gardener, Mr. G. Wythes), for very fine examples of Spanish Cardoons.

Other Exhibits.

The Liverpool Horticultural Company sent Grape Scarborough Seedling, which was considered too near Gros Colmar.

His Grace the Duke of Northumberland sent examples of Improved Round Victoria Spinach and Cheltenham Green-top Beet, which were referred to Chiswick for trial.

Mr. J. O'Brien, Harrow-on-the-Hill, sent good examples of Jamaica Oranges.

Mr. Sidney Ford, Horsham, sent fruits of Apple King of the Pippins.

Messrs. Saltmarsh & Sons, Chelmsford, sent seedling Apple Chelmsford Wonder, which the Committee desired to see again in February or March, with specimens cooked.

Messrs. T. W. Beach & Sons, Brentford, sent an interesting collection of Preserved Fruits.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair, and seven members present.

Diseased Grapes.—Grapes received from Mr. Barron were exhibited, attacked with fungoid disease. Dr. Masters pointed out that the disease had been described by Mr. Worthington Smith, and called attention to its resemblance to and possible connection with "scald," a much commoner complaint in which no fungoid growth has been described.

Soil for Alpine Plants.—The Rev. C. Wolley-Dod showed samples of burnt clay, which he had found the best soil for Alpine plants. To a great extent it prevented the growth of Marchantia, and was soft and friable, and far superior to broken brick. The cost of burning was about a shilling a ton. Professor Church undertook to examine the chemical composition of the earth used.

Effects of Frost.—Dr. Masters showed leaves of Aucuba blackened and killed by exposure to a temperature of -2° Fahr. on the night of November 28 at Croydon. This exceptional temperature was independently confirmed. The Aucuba is among the hardiest evergreens. The variegated leaves appear to suffer most from frost.

Abnormal Development of Bulbs.—Dr. Masters showed bulbs,

probably of *Freesia*, which had sent up a premature development of the shoots in an upward direction, bearing secondary bulbs on its sides. It appeared to be a converse phenomenon to what occurs in the case of bulbs, which send down "droppers," and may possibly be due to too deep planting.

Banksian Rose in Fruit.—Dr. Masters also showed a *Banksian Rose* which had been cross-fertilised by another species. The carpels were developed, but not the hypanthus (the "hip"), so that the same condition was found as in the carpels of *Potentilla* or *Geum*. This species has not been previously known to fruit in this country.

Hybrid Orchids.—Dr. Masters showed two hybrids between *Cypripedium Chantini* and *C. Spicerianum*, whose parents were of inverse sex.

Study of Plant Pathology.—Dr. Masters read a letter he had received from Dr. Sorauer of Vienna, inviting him to join the Internationale Phyto-Pathologische Commission for the study of plant diseases. This Commission has arisen out of the recent Exhibition of Forestry in Vienna. He thought that the invitation might fitly be extended to other investigators of such matters. After some discussion, Mr. Michael moved, "That it be suggested to Dr. Sorauer that the Internationale Phyto-Pathologische Commission place itself in communication with the Chairman of the Scientific Committee of the Royal Horticultural Society with a view to an arrangement for the exchange of information and assistance between the two Societies." This was seconded by Professor Church, and carried.

Fog Investigation.—Dr. Oliver proposed to present an interim report at Easter. This was agreed to.

Books &c. received for the Library of the Royal Horticultural Society from February 1 to December 31, 1890.

“Acta Horti Petropolitani,” Tom. XI., i. “Amaryllidæ,” J. G. Baker. “Aepfel und Birnen des Wiener Marktes.” “Annual Report of the Secretary for Agriculture for Nova Scotia.” “Annual Report of the Bureau of Ethnology,” 2 vols. (1883-1885). “Bibliography of the Muskogean Languages.” “Bibliography of the Iroquoian Languages,” J. C. Pilling. “Botanical Society, Edinburgh, Transactions and Proceedings.” “Bulletin of the Minnesota Academy of Natural Sciences.” “Bulletin, Société d’Hort. de Genève.” “Cellular, Square, and Octagonal Earthworks of Ohio,” C. Thomas. “Choice British Ferns,” C. T. Drury, F.L.S. “Contributions to American Botany,” Vol. XVII. “Daffodil Catalogue,” G. B. Hartland. “Der gegenwärtige Stand des Obstbaues in der Provinz Brandenburg,” “Extra-tropical Plants,” Baron Sir Ferd. v. Mueller. “Flora Batava,” Nos. 289-90. “Fruit Farming,” Cecil H. Hooper. “Heating by Hot-water Pipes,” W. Jones. “Hints on Vegetable and Fruit Farming.” “Illustrirte Gartenzeitung.” “Icones Plantarum,” Vols. XI.-XIX. “Journal of Botany.” “Journal of the Geological Society.” “Journal of the Linnean Society.” “Lydie, Lycie, Carie,” Etudes Botaniques revues par Wm. Barber. “Manual of the Botany of the United States,” A. Gray, 6th edition. “Massachusetts Horticultural Society, Transactions,” 1888. “Our Hardy Fruits,” C. Wynne. “Papers and Proceedings of the Royal Society of Tasmania,” 1889. “Practical Papers on Gardening.” “Problem of the Ohio Mounds,” Cyrus Thomas: “Proceedings of the American Philosophical Society,” Vol. XXVI., No. 130. “Proceedings of the American Academy,” 1888-89 (3 vols.). “Proceedings of the Boston Society of Natural History,” Vol. XIV., Parts 1, 2. “Proceedings of the Royal Society of Edinburgh,” Vols. XV., XVI. “Proceedings of the Royal Society.” “Report on the Botanic Gardens, Adelaide,” Sir R. Schomburgk. “Report of the Conference of Fruit Growers and Vine Growers of New South Wales.” “Second Systematic Census of Australian Plants.” “Smithsonian Report,” 1887. “Smithsonian Report of the United States Nat. Museum,” 1887. “Smithsonian Report of the United States Nat. Museum,” 1886, Part 2. “Société Nationale d’Hort. de France, Journal.” “Societade Broteriana.” “Statistics of Fruit Planting and Cultivation in West Kent,” 1890. “Textile Fabrics of Ancient Peru,” W. H. Holmes. “Transactions of the American Philosophical Society,” Vol. XVI., New Series, Part 3. “Transactions of the Royal Society of Edinburgh,” Vol. XXXV., Parts 1-4. “Transactions of the Massachusetts Horticultural Society,” 1881, Part 2.

Plants, Seeds, &c., presented to the Gardens, 1890.

- Allan (W.), Gunton Park, Norwich.—Grape Vine; Iris reticulata.
 Aplin (J.), Hasfield Court, Gloucester.—Seedling Potatoes.
 Barr & Son, 12 King Street, Covent Garden.—Collection of Flower and Vegetable Seeds; 108 vars. Double Chinese Pæonies; 26 vars. Helianthus; 62 vars. Asters.
 Barrows (W.), Lutterworth, Leicestershire.—Seedling Potatoes.
 Berry (Mrs. E.), The Palace, Much Hadham.—Mina lobata (seed).
 Blair (W. H.), 73 Patrick Street, Cork.—Broccoli, Blair’s April (seed).
 Bunyard & Co. (G.), Old Nurseries, Maidstone.—Vegetable Seeds; Carnation Lorna Doone.
 Cannell & Sons (H.), Swanley.—25 vars. Asters; 7 vars. Helianthus.
 Carter & Co. (James), 237-8 High Holborn.—Vegetable Seeds.

- Christie (D.), Summerhill House, Enfield, co. Meath.—Brussels Sprouts
"Christie" (seed).
- Clarke (Col. Trevor), Welton Place, Daventry.—Flower Seeds.
- Coppin & Sons (G.), Addington, Surrey.—Patent Tree Pruner.
- Daniels Brothers.—2 vars. Godetias.
- Dean (R.), Ranelagh Road, Ealing.—Flower and Vegetable Seeds; 3 vars.
Carnations.
- Deverill (H.), Banbury.—Leek, Oxonian (seed).
- Dicksons (Limited), The Nurseries, Chester.—56 vars. Asters.
- Dobbie & Co., The Nurseries, Rothesay, N.B.—4 vars. Leeks (seed); 50
vars. Pansies (plants).
- Dod (Rev. C. W.), Edge Hall, Malpas.—43 vars. Asters; 11 vars. Helianthus;
2 vars. Rudbeckias.
- Eckford (H.), Wem, Salop.—Flower and Vegetable Seeds.
- Ellington (W.), West Row, Mildenhall, Suffolk.—Seedling Potatoes.
- Fidler (C.), Friar Street, Reading.—2 vars. Broad Beans (seed).
- Foster (J.), Horse Market, Kettering.—Seedling Potatoes.
- Ganony (W. F.), Botanic Garden, Cambridge, Mass., U.S.A.—33 vars. Asters.
- Graaf (S. A. de), Leyden.—70 vars. Bulbs.
- Guilfoyle (W. R.), Botanic Gardens, Melbourne.—51 vars. Australian Seeds.
- Hallock & Son (V. H.), Queens, New York.—Vegetable Seeds; Collection of
Bulbs (Gladioli, Liliiums, &c.)
- Harding (A.), The Gardens, Orton Hall, Peterborough.—Brussels Sprouts
"The Orton" (seed).
- Harrison & Sons, The Nurseries, Leicester.—Leek Harrison's Improved
Musselburgh (seed).
- Hartland (W. B.), 24 Patrick Street, Cork.—Broccoli April Queen (seed).
- Hibberd (S.), Kew.—66 vars. Ivies (cuttings).
- Hobby (D.), Brympton House, Yeovil.—Seedling Peas.
- Hughes (J.), The Gardens, Eydon Hall, Northampton.—Seedling Potatoes.
- Keynes, Williams & Co., The Nurseries, Salisbury.—28 vars. Pompon
Dahlias; 13 vars. Cactus Dahlias.
- King (G. R.), 45 Roden Street, Holloway.—Patent Watering Pot.
- Krelage & Son (E. H.), Holland.—Montbretia imperialis (bulbs).
- Laxton (T.), Bedford.—Vegetable Seeds.
- Lee (G.), Clevedon.—2 vars. Rhubarb.
- Lye (J.), Clyffe Hall, Market Lavington.—Seedling Potatoes.
- Maher (R.), Yattendon Court, Newbury.—Seedling Potatoes.
- Mellish (Miss), Hodsock Priory, Worksop.—Harpalum rigidum.
- Melville (D.), Dunrobin Gardens, Cardiff.—Tomato Cardiff Castle (seed).
Riccartoni (dwarf); Myosotis.
- Morris (R.), Nirvana, Ivybridge.—Grafts of Apple Fameuse.
- Morton (J.), Great Western Street, Aylesbury.—Seedling Peas.
- Murdoch (G.), Rothiemay, Huntly, N.B.—Seedling Potatoes.
- Oakshott & Millard, Reading.—Pea Duke of Fife.
- Oldham (T.), Stoughton Grange, Leicester.—2 vars. Tomatoes (seed).
- Owen (R.), The Nursery, Maidenhead.—Chrysanthemum Sarah Owen.
- Paul & Son, Old Nurseries, Cheshunt.—22 vars. Asters; 10 vars. Helianthus.
- Pettigrew (J.), Castle Gardens, Cardiff.—Tomato Cardiff Castle (seed).
- Pitcher & Manda, The Nurseries, Hextable, Swanley.—17 vars. Chrysan-
themums.
- Prevost (G. W.), The Poplars, Tamworth.—Onion Seed from Bombay.
- Putz & Roes, Nurserymen, Erfurt.—30 vars. Flower Seeds.
- Roemer (F.), Quedlinburg, Germany.—4 vars. Viola tricolor maxima (seed).
- Ross (C.), Welford Park, Newbury.—Seedling Potatoes.
- Royal Gardens, Kew.—Seeds of Chinese White and Chinese Green Cabbages,
and Melon from the Grand Chaco, Argentine Republic.
- Ryder & Son, The Nurseries, Sale, Manchester.—Rhubarb Ryder's Per-
fection.

- Smale (W. B.), Nurseryman, &c., Torquay.—13 vars. Asters; 3 vars. Helianthus.
- Steel (G.), Heatherslaw, Cornhill-on-Tweed.—18 vars. Violas (plants).
- Storrie & Storrie, Dundee.—5 vars. Carnations.
- Stuart & Mein, The Nurseries, Kelso, N.B.—2 vars. Leeks (seed).
- Turner (C.), Royal Nursery, Slough.—15 vars. Pinks; 4 vars. Carnations; 15 vars. Asters; 4 vars. Helianthus; Strawberry Jewel (runners).
- Tyler (Sir J.), Pine House, Holloway.—Hæmanthus sp. (plant).
- Veitch & Sons (James), Chelsea.—Collection of Flower and Vegetable Seeds; 7 vars. Carnations.
- Veitch & Son (R.), The Nurseries, Exeter.—Flower and Vegetable Seeds.
- Vilmorin, Andrieux & Co., 4 Quai de la Megisserie, Paris.—Collection of Flower and Vegetable Seeds.
- Walshaw & Son, Nurserymen, Scarborough.—Calla sp. (plant).
- Wiles (E. S.), Edgcote Gardens, Banbury.—Vegetable Seeds.
- Wilks (Rev. W.), Shirley Vicarage, Croydon.—“Tree Tomato” (plant).
- Wrench & Sons, London Bridge.—Vegetable Seeds.
- Wright (J.), 36 Alma Road, Wandsworth.—2 vars. Tomatoes (seed).

AWARDS MADE

On the recommendation of the Floral and Orchid
Committees.

FROM JANUARY 1 TO DECEMBER 31, 1890.

F.C., First-class Certificate; A.M., Award of Merit; B.C., Botanical Certificate
C., Commended.

- Acer Prince Hendjery (Paul & Son), May 13. F.C.
 Achillea mongolica (Paul & Son), June 10. A.M.
 Amaryllis Grand Monarch (Veitch), April 9. A.M.
 „ The Champion (Veitch), March 11. F.C.
 Angraecum Kimballiana (Vanner), October 14. F.C.
 „ species (Low & Co.), March 11. B.C.
 Anthurium album maximum (Sander), May 28. A.M.
 Aster alpinus speciosus (Barr, Ware), May 28. F.C.
 Babiana rubro-cyanea (De Graaf), July 8. F.C.
 Begonia Black Douglas (Laing), June 10. A.M.
 „ Enchantress (Laing), May 28. A.M.
 „ Golden Queen (Cannell), June 10. A.M.
 „ Henshaw Russell (Laing), May 28. A.M.
 „ H. M. Stanley (Cannell), July 22. A.M.
 „ Lafayette (Cannell), July 22. A.M.
 „ Mme. Pfitzer (Laing), June 10. A.M.
 „ Miss Eastwood (Cannell), June 24. A.M.
 „ Negro Boy (Laing), May 28. A.M.
 „ Rev. W. Wilks (Cannell), May 28. A.M.
 Berberis Thunbergi (W. Paul & Son), October 28. F.C.
 Bertolonia Souvenir de Gand (Williams), June 10. F.C.
 Blandfordia nobilis imperialis (Sander), May 13. F.C.
 Bouvardia Purity (May), October 14. A.M.
 Bulbophyllum amplum (Lawrence), October 14. B.C.
 Calla Elliottiana (Knight), May 13. F.C.
 Campanula persicifolia alba grandiflora (Paul & Son), June 24. A.M.
 Canna Madame Crozy (Paul & Son), May 28. A.M.
 Canterbury Bells (Dean), July 8. Strain Commended.
 Carex species (Robson), October 14. A.M.
 Carnation Mrs. Sanders (Jones), July 8. A.M.
 „ Pride of Great Britain (Fry), June 24. A.M.
 „ Rosalind (Dean), July 22. A.M.
 „ Rowena (Dean), July 22. A.M.
 Catasetum Burgerothi, var. Randi (Linden), October 14. A.M.
 Cattleya aurea Buyssoniana (Linden), October 14. A.M.
 „ „ Imschootiana (Schröder), October 14. F.C.
 „ „ Lindeni (Linden), October 14. A.M.
 „ „ Statteriana (Statter), September 19. F.C.
 „ Gaskellina, Cooke's var. (Cooke), June 24. F.C.
 „ Hardyana, Wilson's var. (Wilson), August 26. A.M.
 „ intermedia Parthenia (Lawrence), June 10. F.C.
 „ Lawrenceana delicata (Schröder), May 28. A.M.
 „ „ Vinckii (Schröder), April 22. F.C.
 „ Lindeni (Linden), October 28. A.M.
 „ Massaiana (Wrigley), August 26. F.C.
 „ Mendelii, Alfred Smee (Smee), June 10. A.M.
 „ „ Prince of Wales (Sander), May 28. F.C.
 „ Mossiæ x Dowiana, Empress Frederick (Schröder), July 8. F.C.

- Cattleya O'Brieniana (Sander), December 9. A.M.
 „ Trianae, var. fulgens (Mildmay), March 11. A.M.
 „ „ „ marginata (Laing), March 11. A.M.
 „ „ „ Tautzianum (Tautz), March 25. A.M.
 „ Warocqueana amethystina (Linden), October 14. F.C.
 „ „ flammaea (Linden), October 14. F.C.
 Chrysanthemum A. Wood (Cannell), November 11. A.M.
 „ Duchess of Westminster (Owen), October 28. A.M.
 „ Mdle. Marie Hoste (Laing), October 28. A.M.
 „ Miss Haggas (Laing), October 28. A.M.
 „ Miss L. Stevens (Reid & Bornemann), September 23. A.M.
 „ Miss V. Tomlin (Laing), October 28. A.M.
 „ Pink Lacroix (Ware, Jones, Owen), October 28. A.M.
 „ Wm. Tricker (Cannell), October 28. A.M.
 „ Vivian Morel (Laing), October 28. A.M.
 Cinerarias, strain (Cannell), March 11. A.M.
 Clematis erecta fl. pl. (Paul & Son), July 22. F.C.
 Cœlogyne tomentosa (Measures), May 13. A.M.
 Crinum brachynema (Smith), June 10. F.C.
 Cunilla Maryana (Pitcher & Manda), October 14. A.M.
 Cydonia japonica Moorlezzii (Veitch), May 13. F.C.
 Cymbidium Tracyanum (Tracy), December 9. F.C.
 Cypripedium Alfred × (Drewett), August 26. A.M.
 „ Antigone × (Veitch), November 11. F.C.
 „ cardinale, Vanner's var. × (Vanner), February 11. F.C.
 „ Cleola × (Veitch), November 11. A.M.
 „ Elliottianum (Pollett), February 11. F.C.
 „ H. Ballantine × (Veitch), August 12. F.C.
 „ hybridum Doris (Cookson), November 11. A.M.
 „ „ Eyermanianum (Sander), November 11. A.M.
 „ „ Maynardi (Sander), December 9. A.M.
 „ „ Pollettianum (Sander), December 9. F.C.
 „ „ Youngianum (Sander), July 8. A.M.
 „ Lathamianum × (Schröder, Tautz, Veitch, Ingram), February 11. F.C.
 „ Muriel Hollington × (Hollington), November 11. A.M.
 „ niveum × (Hollington), June 10. F.C.
 „ Numa (Veitch), March 11. F.C.
 „ Osbornii × (Osborn), December 9. F.C.
 „ porphyrochlamis × (Tautz), February 11. F.C.
 „ Schomburgkianum (Sander), March 11. B.C.
 „ Volonteanum (Sander), May 28. A.M.
 Cytisus scoparius Andreanus (Lawrence, Paul, Veitch), May 13. F.C.
 Dahlia Black Prince (Green), September 9. A.M.
 „ Canary Bird (Harris), August 26. A.M.
 „ Cannell's Favourite (Cannell), September 9. A.M.
 „ Crimson Beauty (Ware), September 9. A.M.
 „ Dr. Peters (Cannell), September 9. A.M.
 „ Eclipse (Cheal), August 26. A.M.
 „ laciniata aurea (Cannell), September 9. A.M.
 „ Lorina (Turner), September 9. A.M.
 „ Maid of Kent (Cannell), September 9. A.M.
 „ Maud (Ware), August 26. A.M.
 „ Midget (Turner), September 9. A.M.
 „ Mrs. Douglas (Cannell), August 26. A.M.
 „ Mrs. Stanley (West), August 26. A.M.
 „ Northern Star (Cheal), August 26. A.M.
 „ Robert Maher (Ware), August 12. A.M.
 „ Rouge Chauvrière (Kelway), August 26. A.M.

- Dahlia Rubens* (Turner), September 9. A.M.
Delphinium Alfred Kelway (Kelway), June 10. A.M.
 „ *Autolyceus* (Kelway), May 28. A.M.
Dendrobium albo-violaceum (Veitch), April 8. B.C.
 „ *Aspasia* × (Veitch), March 11. F.C.
 „ *Bensoniæ alba* (Cypher), May 28. A.M.
 „ *Falconeri delicata* (Cypher), May 28. A.M.
 „ *Juno* × (Lawrence), January 14. F.C.
 „ *lineale* (Veitch), June 10. A.M.
 „ *Luna* × (Lawrence), January 14. F.C.
 „ *MacCarthyiæ* (Cypher), May 28. F.C.
 „ *Macfarlanei* (Veitch), January 14. F.C.
 „ *nobile*, Burford var. (Lawrence), January 14. A.M.
 „ *signatum* (Lawrence), March 11. F.C.
 „ *Smilliæ* (Lawrence), March 11. B.C.
 „ *Wardianum*, Schröder's var. (Schröder), March 25. F.C.
 „ *xanthocentrum* × (Lawrence), January 14. F.C.
Deutzia candidissima fl. pl. (Leach), March 25. A.M.
Dianthus Caryophyllus Margarite—for strain (Veitch), September 9. A.M.
Disa sagittalis (Brightwen), April 8. B.C.
 „ *tripetaloides* (Strickland), June 24. A.M.
Dracæna Miss Glendinning (Veitch), August 12. F.C.
Enkianthus campanulatus (Veitch), May 13. A.M.
Epiphronitis Veitchii (Veitch), June 24. F.C.
Gaillardia Wendell Holmes (Kelway), August 26. A.M.
Geranium Shirley Blue (Wilks), August 26. F.C.
Gladiolus Baron Schröder (Kelway), August 26. A.M.
 „ *Empress of Germany* (Kelway), August 12. A.M.
 „ *E. T. Hallock* (Lemoine), September 9. A.M.
 „ *Le Grande Carnot* (Lemoine), September 9. A.M.
 „ *Lemoinei* Rev. W. Wilks (Lemoine), September 9. A.M.
 „ *Leonard Kelway* (Kelway), September 9. A.M.
 „ *Louis Thibaut* (Lemoine), September 9. A.M.
 „ *Nuée bleue* (Lemoine), September 9. F.C.
 „ *Stanley* (Kelway), August 12. A.M.
Gloxinia Agnes Cook (Cannell), June 10. A.M.
 „ *Gaiety* (Veitch), July 8. A.M.
 „ *Her Majesty* (Sutton), May 28. A.M.
 „ *Mrs. J. Donaldson* (Veitch), May 28. A.M.
 „ *Mrs. Stanley* (Cannell), July 22. A.M.
 „ *New Netted Strain* (Sutton), May 28. A.M.
 „ *Prince of Wales* (Sutton), May 28. A.M.
 „ *Princess of Wales* (Sutton), May 28. A.M.
Godetia Duke of Fife (Daniels), September 9. A.M.
Grammatophyllum multiflorum (Sander), July 8. A.M.
Helleborus colchicus coccineus (Paul & Son), February 11. A.M.
Hydrangea Hortensis fl. pl. (Veitch), August 12. A.M.
Hypericum oblongifolium (Paul), August 12. A.M.
Iris Sindjarensis (Barr), March 25.
Juniperus canadensis (Veitch, Paul & Son), May 13. A.M.
Lælia anceps Schröderiana (Schröder), January 14. F.C.
 „ *elegans Turnerii*, Stand var. (Statter), September 9. F.C.
 „ *Eyermani* (Pitcher & Manda), September 23. A.M.
 „ *Goldiana* (Statter), December 9. F.C.
 „ *grandis* (Sander), July 8. F.C.
 „ *purpurata* Empress (Cypher), May 28. A.M.
 „ *Tresederiana* × (Statter), December 9. A.M.
Lælio-Cattleya Canhamiæ × (Veitch), June 24. A.M.
 „ *eximia* × (Veitch), June 24. F.C.

- Lælio-Cattleya Hippolyta* × (Veitch), March 25. F.C.
 „ *Proserpine* × (Veitch), August 26. A.M.
Lastrea filix-mas cristata fimbriata (Birkenhead), May 28. F.C.
Lilac Mdme. Kreuter (Paul & Son), May 13. F.C.
Lilium Bolanderi (Ware), July 8. A.M.
Lily-of-the-Valley, Fortin's var. (Morse), March 25. A.M.
Lobelia Reine Blanche (Witney), June 10. A.M.
Lunaria biennis variegata (Cutbush), May 13. A.M.
Lupinus Foxei (Kelway), May 28. A.M.
Lycaste Skinnerii, Young's var. (Young), March 11. F.C.
Masdevallia Courtauldiana × (Courtauld) June 24. A.M.
 „ *elephanticeps* (Veitch), July 22. B.C.
 „ *leontoglossa* (Smee), February 11. B.C.
 „ *Lowii* (Courtauld), August 12. F.C.
 „ *Schröderiana* (Schröder), July 8. F.C.
Mentzelia Bartonioides (Wythes), August 26. A.M.
Mignonette Garaway's Double White Improved (Garaway), April 22. A.M.
Miltonia Bleui splendens (Sander), May 28. F.C.
Montbretia crocosmæflora aurea maculata (O'Brien), September 9. A.M.
Narcissus George Engleheart (Engleheart), April 22. A.M.
Nepenthes Burkei excellens (Veitch), August 12. F.C.
 „ „ *prolifera* (Veitch), August 12. A.M.
Nephrolepis exaltata plumosa (May), April 22. A.M.
 Oak (scarlet) "Knap Hill variety" (Waterer), November 11. F.C.
Odontoglossum Duvivierianum (Linden), November 11. A.M.
 „ *Galeottianum* (Statter), June 10. A.M.
 „ *maculatum anceps* (Atkinson), May 13. F.C.
 „ *Noezlianum* (Linden), November 11. B.C.
 „ *Pescatorei melanocentrum* (Tautz), March 11. A.M.
 „ „ var. *Mrs. G. W. Palmer* (Palmer), April 22. A.M.
 „ „ *Tilgate* var. (Nix), June 10. A.M.
 „ *ramosissimum* (Smee), February 11. F.C.
 „ *triumphans aureum* (Smee), April 22. F.C.
 „ *veixillarium*, Fairy Queen (Sander), May 28. F.C.
 „ „ *Le Doux's* var. (Le Doux), April 22. A.M.
Oncidium Larkinianum (Larkin), March 11. A.M.
 „ *roraimense* (Sander), May 28. A.M.
Pæonia conchiflora (Paul & Son), May 28. F.C.
Pæony *Beatrice Kelway* (Kelway), May 13. A.M.
 „ *Berlioz* (Paul & Son), June 24. A.M.
 „ *Daubenton* (Paul & Son), June 24. A.M.
 „ *Duchess of Teck* (Kelway), June 10. A.M.
 „ *Princess Mary* (Kelway), June 10. A.M.
 „ *Sainfoin* (Kelway), June 10. A.M.
 „ *Stanley* (Kelway), June 10. A.M.
Pansy Eynsford Yellow (Cannell), May 13. A.M.
Pelargonium *Midsummer* (Pearson), June 24. A.M.
 „ *Prince Henry* (Perkins), May 28. A.M.
 „ *Turtle's Surprise* (Cannell), July 8. A.M.
Pentstemon *Le Borda* (Kelway), August 26. A.M.
Pentstemon, for strain (Dean), October 28. A.M.
Petunia *Holborn Blue* (Carter & Co.), August 12. A.M.
Phaius Humbloti alba (Schröder), June 10. F.C.
 „ *hybridus Cooksoni* (Cookson), March 11. F.C.
Phalænopsis Micholitzii (Sander), August 12. B.C.
Philadelphus inodorus (Leach), March 25. A.M.
 „ *microphyllus* (Paul & Son, Veitch), June 24. F.C.
Phlox *Le Soleil* (Paul & Son), August 26. A.M.
Phoenix Rœbelenii (Sander, O'Brien), March 11. F.C.

- Picea pungens argentea* (Waterer), December 9. F.C.
Picotee Countess of Jersey (Turner), August 12. A.M.
 „ Mrs. Walford (Turner), August 12. A.M.
Polyanthus Terra Cotta (Dean), April 9. A.M.
Potentilla formosa pallida (Paul & Son), August 26. A.M.
Primrose Oakwood Blue (Wilson), April 8. A.M.
 „ Red Gauntlet (Wilson), April 22. A.M.
Primula alba magnifica (Ryder), May 13. A.M.
 „ Bruce Findlay (Ryder), April 22. A.M.
 „ Distinction (Ryder), April 22. A.M.
 „ Eynsford Pink (Cannell), January 14. A.M.
 „ Eynsford Red (Cannell), January 14. A.M.
 „ Her Majesty (Cannell), January 14. A.M.
Pteris serrulata gloriosa (May), January 14. A.M.
Pyrethrum Carl Vogel (Kelway), May 28. A.M.
 „ Clemence (Kelway), May 28. A.M.
Pyxidantha barbulata (Paul & Son), April 8. A.M.
Rhododendron Ajax (Veitch), June 24. F.C.
 „ *Williamsi* (Williams), April 22. A.M.
Richardia æthiopia Little Gem (Elliott), October 14. A.M.
Rodgersia podophylla (Veitch), June 10. F.C.
Rosa (polyantha) The Engineer (Gilbert), July 8. A.M.
Rose Crimson Globe (W. Paul & Son), May 28. F.C.
 „ J. D. Pawle (Paul & Son), June 24. A.M.
 „ L'Idéal (Paul & Son), July 22. A.M.
 „ Lord Penzance (Penzance), June 10. F.C.
 „ Marchioness of Lorne (W. Paul & Son), June 24. A.M.
 „ Mrs. Paul (Paul & Son), June 24. A.M.
Saccolabium Hendersonianum (Mason), August 12. F.C.
Sarcopodium Dearii (Schröder), May 28. A.M.
 „ *Godseffianum* (Sander), June 24. F.C.
 „ *psittacoglossum* (Lawrence), July 8. B.C.
Sarracenia Claytonii (Wipf), August 12. A.M.
Sequoia sempervirens alba spica (Veitch), August 12. F.C.
Sobralia macrantha, var. *rosea* (Cypher), June 10. F.C.
 „ *Warscewiczii* (Veitch), August 12. F.C.
Spiræa Bumalda variegata (Veitch), July 8. F.C.
Sweet Pea Dorothy Tennant (Eckford), July 8. A.M.
 „ Stanley (Eckford), July 8. A.M.
Tilia euchlora (Veitch), August 12. F.C.
Tree Pruner (Coppin), December 9. C.
Trillium discolor atratum (Veitch), March 25. A.M.
Vaccinium pennsylvanicum (Waterer), November 11. F.C.
Verbena Uranie (Cannell), August 12. A.M.
Xerophyllum asphodeloides (Paul & Son), June 10. A.M.
Zingiber D'Arceyi (Veitch), July 8. A.M.
Zygopetalum crinito-maxillare × (Rothschild), July 8. A.M.

AWARDS MADE

On the recommendation of the Fruit and Vegetable Committee.

FROM JANUARY 1 TO DECEMBER 31, 1890.

F.C., First-class Certificate ; A.M., Award of Merit.

FRUITS.

- Apple Amorel (Ross), March 25. A.M.
 „ Beauty of Stoke (Doe), October 14. F.C.
 Fig St. John (Veitch), July 8. F.C.
 Grape Lady Hutt (Myles), December 9. F.C.
 Melon Barkham's Seedling (Barkham), July 22. F.C.
 „ Ely's Seedling (Ely), September 9. A.M.
 „ Highland's Hybrid (Wilkinson), July 8. A.M.
 „ Syon House Seedling (Wythes), July 8. A.M.
 „ Victoria Cross (Cook), July 8. A.M.
 „ Westley Hall (Bishop), October 14. F.C.
 Strawberry Auguste Nicaise (J. Smith), April 8. A.M.
 „ Crescent City (Paul & Son), June 24. A.M.

VEGETABLES.

- Broccoli Veitch's Model (Leach), May 13. F.C.
 Cucumber Allan's Favourite (Allan), July 8. A.M.
 „ Express (Mortimer), August 12. F.C.

AWARDS MADE

On the recommendation of the Fruit and Vegetable Committee.

CHISWICK TRIALS, 1890.

× × × Signifies "Meritorious in the first degree."
 × × Signifies "Meritorious in the second degree."

- Beans (Broad), Exhibition Long-pod (Bunyard, R. Veitch & Son). × × ×
 Lettuce Early White Self-folding Trianon (Vilmorin). × × ×
 „ (Cos) Prince of Wales (J. Veitch & Sons). × × ×
 Pea Ambassador (Eckford). × ×
 „ Boston Hero (Bunyard). × ×
 „ The Daisy (Carter & Co.). × ×

AWARDS MADE

On the recommendation of the Floral Committee

TO PLANTS GROWN FOR TRIAL IN THE GARDENS AT CHISWICK DURING
THE YEAR 1890.

× × × Signifies "Meritorious in the first degree."
 × × Signifies "Meritorious in the second degree."

Carnation	Albrecht Duesser (Benary).	× × ×
"	Alfred Gray (Dodwell).	× ×
"	Alice Ayres (Veitch, Ware).	× × ×
"	Andromeda (Dodwell).	× × ×
"	Ariel (Dodwell).	× × ×
"	Atalanta (Dodwell).	× × ×
"	Beatrice (Fisher, Son & Sibray).	× ×
"	Boadicea (Douglas).	× × ×
"	Caledonia (Dicksons & Co.).	× × ×
"	Canary (Fisher, Son & Sibray).	× × ×
"	Caractacus (Douglas).	× × ×
"	Clown (Dodwell).	× × ×
"	Comtesse de Paris (Paul & Son).	× × ×
"	Countess of Ellesmere (R.H.S.).	× × ×
"	Diana (Dodwell).	× × ×
"	Edith (Fisher, Son & Sibray).	× × ×
"	Fair Maid (Dean).	× ×
"	Feuerball (Benary).	× × ×
"	Germania (Veitch).	× × ×
"	Gloire de Nancy (Veitch).	× × ×
"	Grandiflora (Veitch).	× × ×
"	Guiding Star (Ware).	× × ×
"	Horace (Dan).	× × ×
"	Hypatia (Paul).	× ×
"	Juliette (R.H.S.).	× × ×
"	Juno (Paul & Son).	× × ×
"	Maggie Lawrie (Dicksons & Co.).	× × ×
"	Merlin (Lakin).	× × ×
"	Mirakel Von Zerbst (Benary).	× × ×
"	Mrs. Frank Watts (Ware).	× × ×
"	Mrs. Reynolds Hole (Veitch).	× × ×
"	Orestes (R.H.S.).	× × ×
"	Oxonian (Dodwell).	× × ×
"	Penelope (Hooper).	× × ×
"	Raby Castle (Turner, Veitch).	× × ×
"	Rose Celestial (Turner).	× × ×
"	Rowena (Dean).	× × ×
"	Scarlet Premier (Storrie).	× × ×
"	Snowdrift (Fisher, Son & Sibray).	× × ×
"	The Moor (Dean).	× × ×
"	Will Threlfall (Paul).	× × ×
Picotee	Admiration (Veitch).	× × ×
"	Agnes Chambers (Turner).	× × ×
"	Augusta (Paul & Son).	× × ×
"	B. J. Bryant (R.H.S.).	× × ×
"	Colonial Beauty (Turner).	× × ×

Picotée	Dorothy (Turner).	x x x
"	Favourite (Turner).	x x x
"	Grosteen (Veitch).	x x
"	Pica (Paul & Son).	x x x
"	Romeo (Paul & Son).	x x x
Dahlia	(Bedding) Flora Macdonald (Turner).	x x x
"	" Marguerite Bruant (Turner).	x x x
"	" Yellow Pet (Turner).	x x x
"	(Cactus) Charming Bride (Ware).	x x x
"	" Empress of India (Keynes, Turner, Ware).	x x x
"	" Henry Patrick (Ware).	x x x
"	" Honoria (Keynes).	x x x
"	" Juarezii (Keynes, Turner).	x x x
"	" Lady Kerrison (Ware).	x x x
"	" Mr. A. W. Tait (Keynes).	x x x
"	" Mrs. Hawkins (Ware).	x x x
"	" Panthea (Keynes).	x x x
"	(Fancy) General Gordon (Turner).	x x x
"	" Grand Sultan (Turner).	x x x
"	" Queen Mab (Turner).	x x x
"	(Pompon) Admiration (Turner).	x x x
"	" Brunette (Keynes).	x x x
"	" Cupid (Turner).	x x x
"	" Darkness (Keynes).	x x x
"	" Dove (Turner).	x x x
"	" E. F. Junker (Keynes, Turner).	x x x
"	" Ernest (Turner).	x x x
"	" Fairy Tales (Keynes).	x x x
"	" Fanny Weiner (Turner).	x x x
"	" Fashion (Keynes).	x x x
"	" Gem (Keynes, Turner).	x x x
"	" Isabel (Keynes, Turner).	x x x
"	" Janet (Keynes).	x x x
"	" Lady Blanche (Keynes).	x x x
"	" Lady Jane (Turner).	x x x
"	" Mabel (Keynes).	x x x
"	" Millie Wood (Keynes).	x x x
"	" Mdme. V. Faconet (Keynes, Turner).	x x x
"	" Princess Sophie (Turner).	x x x
"	" Red Indian (Keynes).	x x x
"	" Rosalie (Keynes).	x x x
"	" Rosetta (Keynes).	x x x
"	" The Khedive (Keynes).	x x x
"	" Whisper (Keynes).	x x x
"	" White Aster (Keynes, Turner).	x x x
"	(Show) Condor (Turner).	x x x
"	" Cyprus (Turner).	x x x
"	" Diadem (Turner).	x x x
"	" George Rawlings (Turner).	x x x
"	" Goldfinder (Turner).	x x x
"	" J. B. Service (Turner).	x x x
"	" Leah (Turner).	x x x
"	" Mrs. Gladstone (Turner).	x x x
"	" Mrs. Glasscock (Turner).	x x x
"	" Mrs. Harrison (Turner).	x x x
"	" Ovid (Turner).	x x x
"	" Pioneer (Turner).	x x x
"	" Primrose Dame (Turner).	x x x
"	" Royal Queen (Turner).	x x x

Dahlia (Show)	Royalty (Turner).	x x x
"	" Statesman (Turner).	x x x
"	" Toison d'Or (Turner).	x x x
" (Single)	Alfonso (Cheal).	x x x
"	" Cetewayo (Cheal).	x x x
"	" Florrie Fisher (Ware).	x x x
"	" Formosa (Cheal).	x x x
"	" Kate (Ware).	x x x
"	" Lady Monckton (Cheal).	x x x
"	" Miss Henshaw (Ware).	x x x
"	" Mr. Kennett (Cheal).	x x x
"	" Miss Linaker (Cheal).	x x x
"	" Sunningdale White (Cheal).	x x x
"	" The Sport (Cheal).	x x x
Fuchsia	Dunrobin Bedder (Melville).	x x
Mimulus	moschatus compactus (Putz & Roes).	x x
Viola	Duchess of Fife (Dobbie).	x x x
"	Duchess of Sutherland (Dobbie).	x x
"	Marchioness of Tweedale (Dobbie).	x x
"	Neptune (Dobbie).	x x x
"	The Bride (Dobbie).	x x x
Pelargonium (Double-flowered Ivy-leaved)	Comtesse Horace de Choiseul (Lemoine).	x x x
"	" De Quatrefages (Lemoine).	x x x
"	" Galilee No. 1 (Lemoine).	x x x
"	" Galilee No. 2 (Lemoine).	x x x
"	" Gloire d'Orleans (Lemoine).	x x x
"	" Le Printemps (Lemoine).	x x x
"	" Madame Thibaut (Lemoine).	x x x
"	" Souvenir de Charles Turner (Lemoine).	x x x
"	(Single-flowered Ivy-leaved) Gem (Cannell).	x x x
"	" Mrs. H. Cannell (Cannell)	x x x
"	(Zonal) Charles Mason (Pearson).	x x x
"	" Mons. Poirier (Lemoine).	x x x
Stock (Dwarf-flowering Ten-week),	Lilac (Putz & Roes).	x x x
" (Large-flowering	" Aurora (Putz & Roes).	x x
"	" Brilliant Rose (Putz & Roes).	x x x
"	" Purple (Putz & Roes).	x x x
"	" Sulphur Yellow (Putz & Roes).	x x x
"	" White (Putz & Roes).	x x x

INDEX.

- Abelia rupestris*, cxliv
Aberia Caffra, cxxx
Acacia retinodes, xxviii
 „ *Seyal*, stipules, ci
Achillea mongolica, lxxxii
Adiantum Porteri, xxix
Æchmea glomerata, xxviii
Æcidium on Black Currant leaves, cx
Æranthes Leonis, xliv
Ærides suavissimum, xliv
African Marigolds, 399
Agapanthus umbellatus malformed,
 cxxii
Agaricus melleus, *Rhizomorpha* of, cvii
Akebia quinata, xxii
Alpine or Rock Plants, 285
 „ *Plants*, Soil for, clxxxii
Althæa rosea, 544
Amaryllis, 243, 255
 „ *culture*, 252
Andromeda japonica, cxxix
Anemone coronaria, lx
 „ *hortensis*, xlix
Anemones, 275, 279
Angræcum citratum giganteum, cxxxvii
 „ *Germinyanum*, cxxxviii
 „ *Kimballianum*, cli
 „ *new var.*, cxxxi
 „ *sesquipedale*, xlv
Annuals, Hardy, 407
Anthurium album maximum, lxxvi
Antirrhinum majus, Monstrous, clv
 „ *with Virescent Corolla*,
 cxiv
Apple Amorel, cxxxix
 „ *Beauty of Stoke*, clii
 „ *Diseased*, clxi
 „ *Translucent*, clxvi
 „ *Trees*, Canker in, xxvi
Apples, cxxxii, li
 „ *from Australia*, lxxxvi
Arisæma proboscideum, lxvi
 „ *speciosum*, cxxviii
Aristolochia Goldieana, liii
 „ *ringens*, lxvi
Arrowroot Plants, cxxviii
Artichokes, Globe, 53, 71
 „ *Jerusalem*, 53, 83
Artificial Manures, 24
Asarum Hookeri insignis, lxvii
Asparagus, 48
 „ *Chicory*, 97
 „ *French culture*, 17
 „ *in Autumn*, 11
 „ *on heavy soil*, 11
Aster alpinus speciosus, lxxv
Asters, China, 401
Astrapæa Wallichii, xxii
Auriculas in Towns, 381
Awards made, 406
Azalea rosæflora, xlvi
Azaleas, Hardy, 421
Babiana rubro-cyanea, xcvi
Banksian Rose in Fruit, clxxxiii
Barbe de Capucin, 269
Batemannia Wallisii, lxxxiii
Beans, 53, 76
Beets, 53, 89
 „ *Leaf*, 96
Begonia Black Douglas, lxxxii
 „ *Enchantress*, lxxv
 „ *Golden Queen*, lxxxii
 „ *Henshaw Russell*, lxxxii
 „ *Madame Pfitzer*, lxxxii
 „ *Negro Boy*, lxxvi
 „ *Rev. W. Wilks*, lxxvi
Begonias, ciii
Bigenor (?)—Dahlia and Helianthus,
 clxi
 „ *(?)—Raspberry and Straw-*
berry, xciii
Berberis Thunbergii, clvii
Bertolonia Souvenir de Gand, lxxxii
Blandfordia nobilis imperialis, lviii
Blight, xciii
Bluebells degenerating, lxvi
Borecole, 54, 70, 98
Boronia heterophylla, cxxix
 „ *megastigma*, cxxix
Bouvardia Purity, clxix
Broad Beans, 53
Broccoli, 49, 70, xlv
 „ *Veitch's Model*, lxix
Brussels Sprouts, 49, 71
Bud, Endogenous (?), clxv
Bug, Plant, lxiv
Bulbophyllum grandiflorum, xcix
Bulbs, Abnormal Development of, clxxii

- Buphane toxicaria, xxviii
 Cabbage, Red, 68
 Cabbages, 49, 67
 Calceolarias dying off, xciv
 Calla Elliottiana, lviii
 Camaridium ochroleucum, cxxxii
 Canker in Apple Trees, xxvi
 Canna Madame Crozy, lxxvi
 Caprificus, or Wild Fig, xcv
 Capsicum Coral Red, xciv
 Capsicums, 55, 78
 Cardoons, 53, 96
 " Spanish, clxxi
 Carnation, Best Varieties, 487
 " Botany of, 464
 " Conference, 461
 " Exhibition, 471
 " Germania, xcvi
 " Hardiness of, 461, 488
 " in Borders, 488
 " in Towns, 477
 " Marguerite, cxxv
 " Mrs. Frank Watts, xciv
 Carnations, ciii, civ, cxii
 " attacked by Wireworm, ci
 " " Tipula, cvii,
 " cxix
 Carrots, 50, 91
 Catasetum atratum, xci
 " Burgerothii Randii, cli
 Cattleya aurea Imshoottiana, cl
 " " Lindeni, cl
 " " Statteriana, cxxxii
 " citrina, lxi
 " Du Buyssoniana, cli
 " Empress Frederick, xxviii
 " Gall on Stem of, xxv
 " Gaskelliana alba, cxxxii
 " granulosa Russelliana, clix
 " Hardyana, Wilson's var.,
 " cxxvi
 " intermedia Parthenia, lxxxiii
 " labiata Warneri, lxxxiv
 " " Warocqueana, lxi
 " Lawrenceana delicata, lxxvii
 " " Vinckii, l
 " Lindeni, clviii
 " Massaiana, cxxvi
 " Mendelii Alfred Smea, lxxxiv
 " Mendelii hackbridgensis,
 " lxxxv
 " " Prince of Wales,
 " lxxvii
 " Mossiæ decora, lxxxv
 " Nilssoni, cxvii
 " O'Brieniana, clxx
 " Trianæ fulgens, xxxi
 " " marginata, xxxi
 Cattleya labiata Schröderæ, xlv
 " " Trianæ Schröderæ alba, xxxviii
 " " Tautziana, xxxvii
 " " Warocqueana amethystina, cl
 " " flammea, cl
 Cauliflower, 50, 70
 Cedrus atlantica glauca, clxviii
 Celeriac, 95
 Celery, 50, 94
 Cerambyx miles, lxx, lxxxvi
 Ceratitis citriperda, lxx
 Cercis siliquastrum, lx
 Cherry Laurel Fruits poisonous to
 Peafowl, cviii
 Chervil, 56,
 Chicory, 55, 262, 268
 " Asparagus, 97
 " Witloef, 19
 Chillies, 78
 China Asters, 401
 Chionanthus virginica, xlvi
 Chives, 56
 Christmas Roses, 274
 Chrysanthemum, best for various pur-
 poses, 195
 " Centenary, 106
 " Damping, 218
 " Dates and Authori-
 ties, 169
 " Dwarfing, 172, 218
 " for Out-doors, 195
 " Grouping, 177
 " "Hen and Chicken"
 form, clxvi
 " History of, 115
 " Judging, 127
 " Market, 179
 " New Varieties of, 122
 " Progress, 137
 " Seeds, &c., 150
 " Soil for, 218
 " Species, 112
 " Statistics, 203
 " Summer, 184, 186,
 " 213
 " the Blue, 143
 " Wild Progenitors of,
 " 111, 171
 Citrons, fingered, xli
 Clematis erecta fl. pl., ciii
 Cleome leptaphylla, clviii
 Cœlogyne barbata, clxx
 " cristata, xxiii
 " pandurata, xxxviii
 " tomentosa, lxi
 Coleworts, 67
 Conference, Carnation, 461
 " Chrysanthemum, 106

- Conference, Daffodil, 288
 " Fern, 495
 " Vegetable, 1
 Corn Salad 19, 56, 263
 Cress, Water, xxxix
 Crinum brachynema, lxxxii
 " Powell album, cxliv
 Crocuses, 275
 Cucumber Lockie's Perfection, xxxix
 Cucumbers, 52, 74
 Cunilla Maryana, cxlix
 Currant and Gooseberry, hybrid
 between, xciii
 Cydonia japonica Moorlezi, lviii
 Cymbidium albucaeflorum, lxii
 " chloranthum, li
 " eburneo-Lowianum x,
 xxxi
 " Tracyanum, clxviii
 Cynomorium coccineum, lxxxvii
 Cyripedium Alice x, cxvii
 " Antigone x, clxiii
 " Apollo x, li
 " Arthur x, cxvii
 " Aylingii x, lxxxiv
 " barbatum, lxii
 " calceolus, lxii
 " chlorops x, xxxviii
 " Cleola x, clxiii
 " Constance x, cxvii
 " Doris x, clxiii
 " Eyermaniana x, clxiii
 " Fairieanum, cl
 " Germinyanum x, xxii,
 xxiii
 " glanduliferum, cxxxii
 " H. Ballantine x, cxvii
 " Hookeræ, lxii
 " insigne, xxiii
 " Lathamianum x, xxii,
 xxvi
 " Mawoodi x, cxvii
 " Maynardii x, clxx
 " Muriel Hollington x,
 clxiii
 " niveum, xlv
 " Numa, xxx
 " Numa x, cxvii
 " Osbornei x, clxviii
 " Othello x, xxxi
 " Pollettianum x, clxviii
 " porphyrochlamis x, xxii
 " Poyntzianum x, xxxviii
 " præstans, cxxxii
 " Schomburgkianum, xxx
 " superbiens with ab-
 normal labellums,
 cxviii, cxxi
- Cyripedium Volonteanum, xxviii
 " Youngianum, xcviii
 Cyrtopodium Saintlegerianum, xxxvii
 Cytisus Adami x, xlvi
 " scoparius Andrcanus, lviii
 Daffodil, Best Varieties, 370, 373
 " Bicoloured, 303, 358
 " Bulbs with Merodon, cxxii
 " Conference, 288
 " Culture of, 336, 349, 354
 " Doubling of, 292, 333
 " Fly, the, 313, 346
 " for Market, 346
 " History of, 296
 " Hybrid, 306
 " in the Scilly Islands, 311
 " Naming, 289, 293
 " Polyanthus, 339, 365, 372
 " Rot, 337
 " Seedling, 316
 " Species, Culture of, 323
 " Trumpet, 326
 " Varieties of, 357
 " White, 295, 302, 360, 371
 Dahlia Conference and Exhibition,
 cxxxvii
 Dahlias, cxxiv, cxxix
 Dandelion, 56, 266
 Datura leaves diseased, xciii
 Delphinium Alfred Kelway, lxxxii
 " Autolyceus, lxxvi
 " diseased, lxxv
 " Injured Foliage of, lxxxvi
 Dendrobium albo-violaceum, xlvi
 " aqueum, cxxxii
 " Aspasia x, xxx
 " Aurora x, xxiv
 " Bensoniæ album, lxxvii
 " bracteosum, cvi
 " (Bulbophyllum) amplum,
 cli
 " Falconeri delicatum,
 lxxvii
 " Galliceanum, lxi
 " lineale, lxxxv
 " MacCarthiæ, lxxvii
 " micans, cxxi
 " new sp., xlv
 " signatum, xxx
 " Smiliæ, cxxi
 " sulcatum, li
 " Waltoni, xxiv
 " Wardianum, Schröder's
 var., cxxxvi
 Deutzia candidissima, cxxxv
 Dianthus Caryophyllus Marguerite,
 cxxix
 Disa sagittalis, xlv, xlvi

- Disa tripetaloides*, lxii, xci
Doronicum plantagineum excelsum,
 xlix
 Ebony, St. Helena, xl
 Egg Plant, 54
 Endive, 19, 53, 93, 262
 Endogenous Bud (?), clxv
Enkianthus campanulatus, lviii, lx
Epidendrum falcatum, cv
 " *radiatum fucatum*, cli
Epiphronitis Veitchii ×, xc
 Eschalots, 87
 Fern Conference, 495
 " Naming, 495
 Ferns, Crossed Varieties, 505
 " Hardy, 520
 " Hybridisation, 505, 513
 " Morphology of, 496
 " Plumose British, 515
 " the Oldest, 496
 Fig St. John, lxxviii
 Figs, xl
 Fig-tree, Scale on, xlvi
 Findlay, Bruce, lxviii
 Fingered Citrons, xli
 " Orange, xlvi
 Florida Pine, xli
 " Flower of Good Luck," 344
 Flowers, Hardy Herbaceous, 445
 " " List of, 457
 " Experiments on Colours of,
 liv
 Fly, the Daffodil, 313, 346
 Fog Report, xxxiii, clvi, clx
 Fogs, London, xxvi
 Foliage with Foliateous Appendages, cii
 French Beans, 49, 77
 " Marigolds, 399
 Frost, Effects of, clxxii
 Fruit Evaporating, 532
Fuchsia triphylla alba carminata,
 Garlic, 56, 87
Garrya elliptica in Fruit, clx
Geranium Wallichianum, cxxiv
 Gladioli, cxxviii
Gladiolus Frœbeli, 555
 " *gandavensis*, Culture of, 564
 " Hardy, 549
 " *Lemoinei*, 555
 " *nanceianus*, 561
 " Origin of, 574
 " *purpureo-auratus*, 554
 " *Saundersii*, 559
 " with unsymmetrical flowers,
 cii
Gloxinia Agnes Cook, lxxxii
 " Her Majesty, lxxvi
 " leaves diseased, cxxii
Gloxinia Mrs. J. Donaldson, lxxvi
 " New Netted Strain, lxxvi
 " Princess of Wales, lxxvi
Godwinia gigas, xxviii
 " Good Luck, Flower of," 344
 Gourds, 72
Grammatophyllum multiflorum, cv
 Grape Conference and Exhibition,
 cxxxix
 " Lady Hutt, clxxi
 " Seedling, cxxv
Haastia pulvinus, cxxiii
Habenaria militaris, cxxxix
 Hardy Carnations, 461
 " Flower Garden, 445
 " Flowers for Borders, List of, 457
 " Gladioli, 549
Hedera vars., 387
Hedychium Gardnerianum, cxv
 Hellebores, 274
 Herbaceous Borders, 445
 Herbs for Flavouring, 55, 97
 Heteræcismal Fungi, cix
 Hibberd, the late Mr. Shirley, clxvii
 Himalayan Primroses, 378
Hippeastrum, 243, 255
 " (*Amaryllis*) Champion,
 xxviii
 " Grand Monarch, xliii
 Hollyhocks, 544
 " Diseases of, 547
 Horseradish, 54
 Hybridisation of Peas, 34
Hydrangea hortensis fl. pl., cxiv
Hypericum Coris, cxv
 " *oblongifolium*, cxv
 Indian Corn, 54, 99
Iris lævigata, cxv
 " " White Banner, xciv
 " Princess Beatrice, xciii
 " *reticulata*, xciii
 " *Sindjarensis*, xxxvi, xl
 " Spanish, with supernumerary
 parts, xciii
 Ivy, Varieties of, 387
Jeffersonia diphylla, Fruit of, cxxii
Juniperus canadensis aureus, lx
 Kale, 54, 70, 98
 Kei Apple, cxxx
 Kidney Beans, 77
 Kohl Rabi, 54, 89
 Laburnum as a Poison, cviii
Lælia elegans, Stand var., cxxxix
 " *Eyermaniana*, cxliv
 " *Gouldiana*, clxx
 " *grandis*, cviii
 " *monophylla*, cxxxii
 " *purpurata Brysiana*, lxii

- Lælia purpurata* Empress, lxxvii
 „ „ *Studdii*, lxi
 „ *Tresederiana* ×, clxx
 „ *Two-lipped*, xciv
Lælio-Cattleya Canhamiæ, xci
 „ „ *eximiea* ×, xc
 „ „ *Hippolyta* ×, xxxvii
 „ „ *Proserpine* ×, cxxvi
Lastrea filix-mas cristata fimbriata,
 lxxv
Leeks, 54, 83
 „ *Bulbous*, 99
Lemon Seeds germinating, lxxxvii
Lettuces, 18, 52, 94, 262
Leucadendron argenteum, clxvi
Lilac Madame Kreuter, lviii
Lilium Martagon, Fasciated, ci
Lobelia Reine Blanche, lxxxii
London Fogs, xxvi
Loranthus, Fruit of, xxxiii
Lunaria biennis variegata, lx
Lupinus Foxi, lxxvi
Lycaste Skinneri, Monstrous, clxvi
Lygus pabulinus (Plant Bug), lxiv
Magnolia conspicua, xliii
Maize, 54, 99
Manure for Vegetables, 20
Maranta arundinacea, xxviii
 „ *Warscewiczii*, xliii
Marigolds, 399
Marrows, Vegetable, 53, 72
Masdevallia Amesiana ×, cxvii
 „ *Arminii*, li
 „ *Courtauldiana* ×, xci
 „ *elephanticeps*, cvi
 „ *leontoglossa*, xxii
 „ *Lowii*, cxvi
 „ *O'Brieniana*, lxi
 „ *Rolfeana*, cv
 „ *Schröderiana*, xcvi
 „ *Stella* ×, clii
Mealy Bug at Alexandria, xxv
Melampsora on Salix repens, cxi
 „ *vernalis on Saxifraga*
granulata, cxi
Melon Idsworth Park Beauty, xciv
 „ *Pear*, the, 98
 „ *Westley Hall*, clii
Merodon equestris, 313, 346
Merulius lachrymans (?), clv
Mignonette, Garaway's Double White
Improved, xlvi
Miltonia Bleuï splendens ×, lxxvii
 „ *vexillaria Fairy Queen*, lxxvii
 „ „ *Le Doux var.*, l
Montbretia crocosmiæflora aurea
maculata, cxxix
Morphology of Ferns, 496
- Mushrooms*, 51
Mustard and Cress, 54
Narcissi, Hybrid, lii
Narcissus, 288, 323
 „ *History of*, 296
 „ *Polyanthus*, 339
 „ *Report of Committee*, 291
 „ *Sport of*, xli
Nepenthes Burkei excellens, cxiv
 „ „ *prolifca*, cxiv
Nephrolepis exaltata plumosa, xlix
Neviusa alabamensis, lxvi
Notospartium Carmicheliæ, xc
Nymphæa stellata zanzibarensis,
 lxxxiii
Oak, Scarlet-leaved, clxii
Oak-staves, Perforated, ci, cvii
Ochna multiflora, l
Odontoglossum crispum Bickleyense,
 xxiii
 „ *Duvivierianum*, clxiii
 „ *excellens*, Albert
 „ *Edward*, lxii
 „ *Galeottianum*, lxxxiv
 „ *Leeanum*, xxxviii
 „ *maculatum anceps*, lxi
 „ *Noezlianum*, clxiv
 „ *Pescatorei*, var. *me-*
lanocentrum, xxxi
 „ *Pescatorei*, *Tilgate*
var., lxxxiv
 „ *Pescatorei*, Mrs. G. W.
Palmer, l
 „ *ramosissimum*, xxii
 „ *triumphans aureum*, l
Oncidium bifolium majus, xxxviii
 „ *chrysocephalus*, cv
 „ *Larkinianum*, xxxi
 „ *phymatochilum*, li
 „ *roraimense*, lxxviii
 „ *sarcodes*, xxxvii
 „ *sphacelatum*, lxxxv
 „ *tetracopsis*, xxxi
 „ *tetrapelatum*, xxxviii
Onions, 52, 84
Orange, Fingered, xlv
 „ *Pistilody of Stamens in*, xciv
Orchid, Bigener, xciv
Orchids, Disease of, xxv
 „ *Rules for Naming*, lv
Oxalis imbricata fl. pl., cxliv
Pæonia, the Genus, Classification of,
 428
Pæonies, lxxxii
 „ *Herbaceous*, 422, 443, lxxxiii
Pæony conchiflora, lxxv
 „ *Tree, Beatrice Kelway*, lx
Pansy Eynsford Yellow, lx

- Papaver orientale semiplena, cxxix }
 " Rhœas vars., 397
 " somniferum, 396
 Parsley, 52, 97
 Parsnips, 54, 92
 Pear, Marguerite Marillat, cxxx, cxlvi
 " the Melon, 98
 Peas, 48, 77, xciv, xcv
 " Hybridisation of, 34
 " Improvement in, 29
 Pelargonium Prince Henry, lxxvi
 Phaius Cooksoni ×, xxx, lxii
 " Humblotii albus, lxxxiii
 Phalænopsis Micholitzii, cxvii
 " Schilleriano-gloriosa,
 xxxviii
 Philadelphus inodorus, xxxv
 " microphyllus, lxxxviii
 Phoenix Rebelinii, xxviii
 Phylloxera at Chiswick, cviii, cxix
 Picea nobilis, xxvi
 " pungens argentea, clxvii
 " " glauca, clxviii
 Picotees, Best Varieties, 488
 " for Exhibition, 471
 Pine Apple Queen, cvi
 " Florida, xli
 Pistacia Lentiscus, Galls on, xciv
 Plant Diseases, liii
 " Pathology, Study of, clxxiii
 Plants from Chiswick, Distribution of,
 cxix
 Plantain Fruit, clv
 Poa annua, Rootgalls on, xlvi
 Polyanthus Terra-Cotta, xliii
 Poppies, Annual, 396
 Potato Disease, cxi, cxx
 " " Remedy for, liv
 Potatoes, 51, 79
 " Field, 81
 " Improvement in, 41
 " New Varieties, 82
 " Select Garden, 80
 Preserved Fruit Exhibition, cliii
 Primrose Boseawen's Double Yellow, l
 " Oakwood Blue, xliii
 " Purple, xlvi
 " Red Gauntlet, xlix
 " var., liii
 " with Foliaceous Corolla, lv
 Primroses, 279
 " Cultivation of, 375
 " degenerating, lxvi
 Primula amœna vars., xlv
 " metamorphosed, lxvi
 " Sieboldi, xlviii
 " " alba magnifica, lx
 " species, 376
 Prince of Wales, Address to, lxvii
 Puccinia Agrostidis, cix
 " Digraphidis, cx
 " Festucæ, cix
 Puccinia malvacearum, 547
 Puya chilensis, lxxv
 Pyrethrum Carl Vogel, lxxvi
 " Clemence, lxxvi
 Pyxidantha barbulata, xliii
 Radishes, 54, 96, lxxviii
 Rampion, 55, 263
 Red Cabbage, 69
 Rhizomorpha of Agaricus melleus,
 cvii
 Rhododendron Williamsii, xlix
 Rhubarb, 51
 Richardia æthiopica Little Gem, cxlviii
 Rock Plants, 285
 Rodgersia podophylla, lxxxii
 Rose Conference, National, xciii
 " (H. P.) Crimson Globe, lxxv
 Royal Gardens, Kew, Exhibits from,
 xxviii, xliii, xlix, lx, civ, clviii
 Runner Beans, 53, 76
 Saccolabium Hendersonianum, cxvii
 St. Helena Ebony, xl
 St. John Fig, lxxviii, c
 Saladings, 260
 " Small, 95
 Salads in Winter, 18
 Salsafy, 54, 93, 263
 Sarcopodium Dearei, lxxviii
 " Godseffianum, xc
 " psittacoglossum, xcix
 Sarracenia Claytonii, cxv
 Satyrium carneum, cxxvii
 Satyriums, cxvi
 Savoys, 54, 69
 Saxifrages, 276
 Scarlet Runners, 77
 Scorzonera, 54, 93
 Seakale, 50
 Sequoia sempervirens alba spica, cxiv
 Shallots, 55, 87
 Show in Temple Gardens, lxvii
 Shrubs in pots, 233
 " Spring-flowering, 286, 409
 Snowdrops, 275
 Sobralia macrantha rosea, lxxxiii
 " Warszewiczii, cxvii
 Solanum Wendlandii, lxxxiii
 Sorrel, 55
 Spathiphyllum longirostre, clviii
 Spinach, 50, 72
 Spiræa Bumalda variegata, cxvi
 Spring Flower Garden, 273
 " Flowering Shrubs and Trees,
 409

- Sprouts, Brussels, 71
 " Hutton Hall, 98
 Stachys tubifera, 19, 55, 92
 Staphylea colchica, xlvi
 Stocks, Ten-week, 400
 Strawberry Auguste Nicaise, lxxviii
 Strelitzia Nicolai, xxviii
 Stylidium graminifolium, cxxi
 Sugar-cane Borer, xxv, xxxiii
 " Seedlings of, xxxiii
 Sweet Briar Lord Penzance, lxxxii
 Tacca artocarpifolia, xxviii
 Teerya Purchasi, lxxxvii
 Temple Show, 1890, lxvii
 " " Clematis at, lxxiii
 " " Ferns at, lxxii
 " " Fruit and Vegetables at,
 lxxiv
 " " Hardy Plants, &c., at,
 lxxiii
 " " Medals awarded at,
 lxxix
 " " Orchids at, lxix
 " " Roses at, lxxii
 " " Silver Cups awarded
 at, lxxix
 " " Soft-wooded Plants at,
 lxxiii
 Thompson, David, xlvi
 Tilia euchlora, cxiv
 Tomatoes, 52, 75
 " diseased, cix, cxix
 " New Varieties, 398
 Tree Ivy, 393
 Tree Pruner, Patent, clxviii
 Trees, Spring-flowering, 409
 Trillium discolor atratum, xxxvi
 Triosteum pinnatifidum, lxvi
 Turnips, Garden, 51, 87
 Uromyces maritima, cx
 Vaccinium pennsylvanicum, clxii
 Vanda alpina, lxvi
 " Kimballiana, cxxvi
 " Sanderiana, cxxxii, clxix
 Vegetable Conference, 1
 " " Statistics, 67
 " Marrows, 53, 72
 Vegetables, A Year's Supply of, 47
 " Cultural Notes, 99
 " Manures for, 20, 49
 Veitch Memorial Medal, xlvi
 Vine Moth, cxlii
 Vines, Atrophied Foliage of, cviii, cxx
 " Diseased, xlvi
 " " Treatment of, liii
 Watercress, xxxix
 Weaver Bird from Paraguay, Nest of,
 cvii
 Wildsmith, Mr. W., xxv
 Winter Gardening, 233
 " Saladings, 18
 Wireworm, Carnations attacked by, ci
 Witloef, 19, 270
 Xerophyllum asphodeloides, lxxxii
 Zingiber D'Arceyi, cxvii
 Zygopetalum crinito-maxillare ×,
 cxviii



