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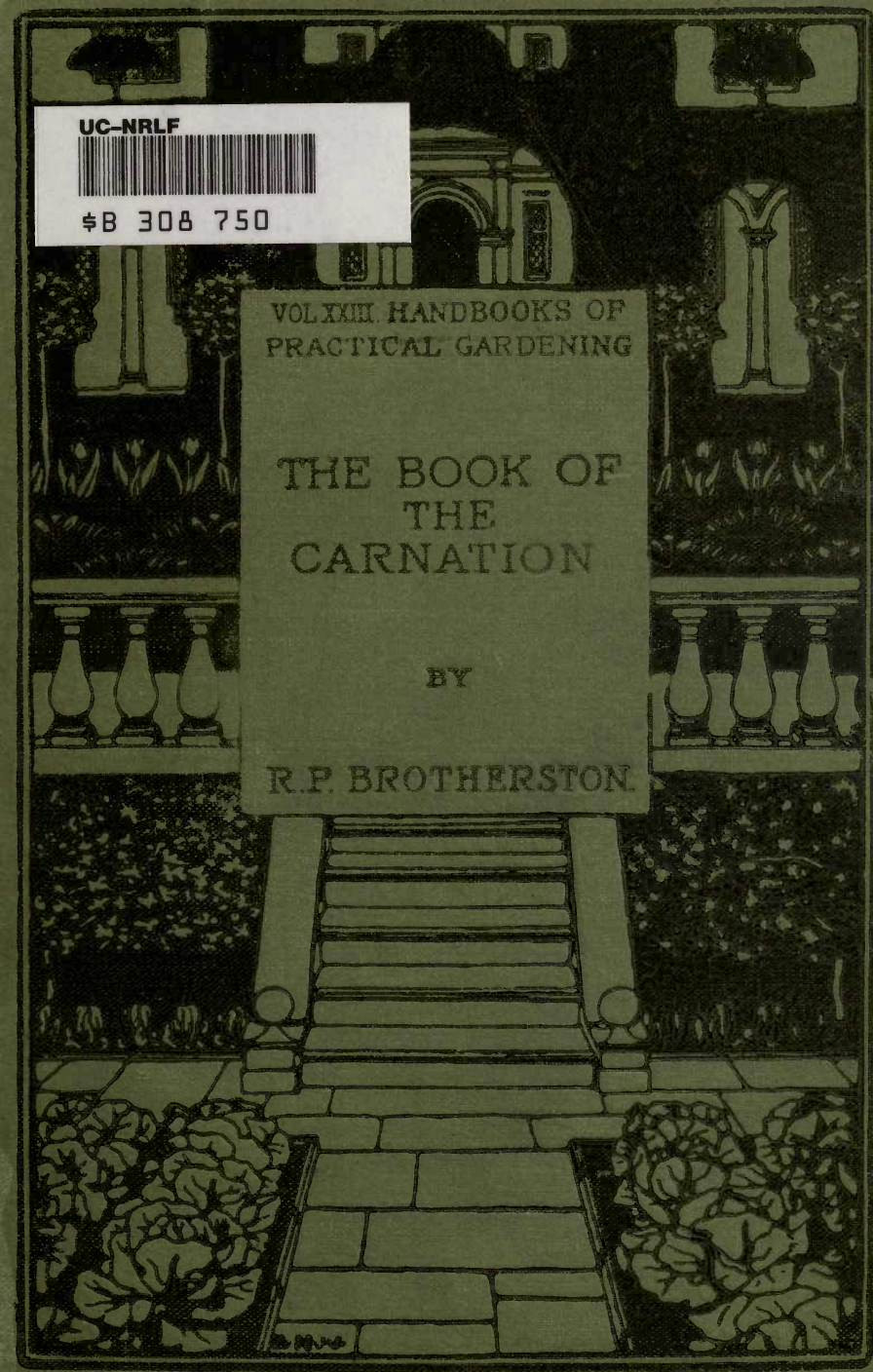
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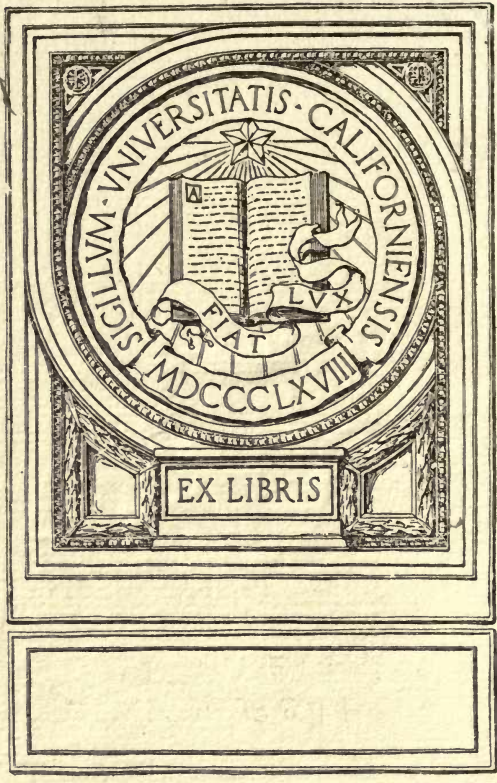
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THE BOOK OF  
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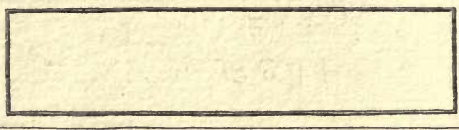
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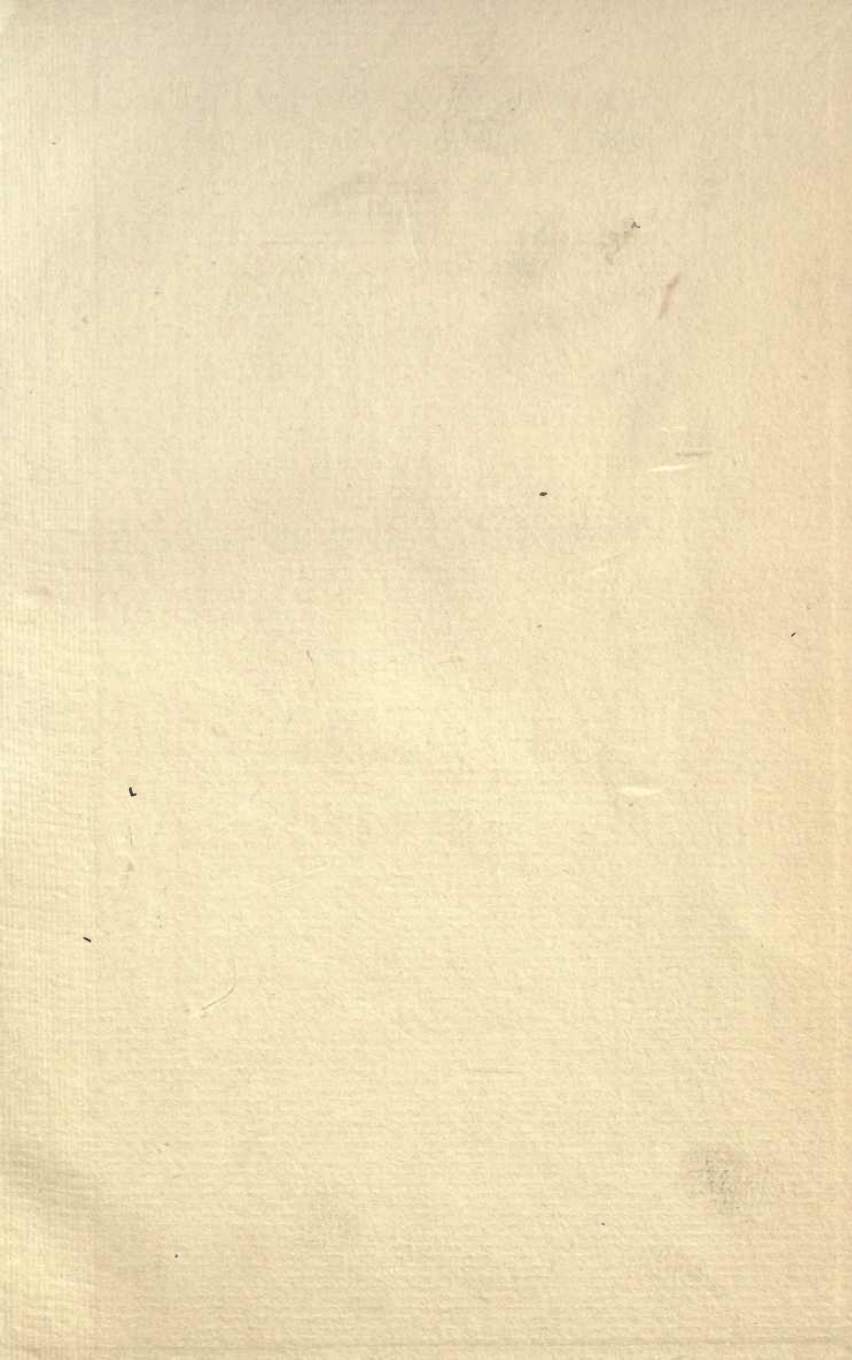
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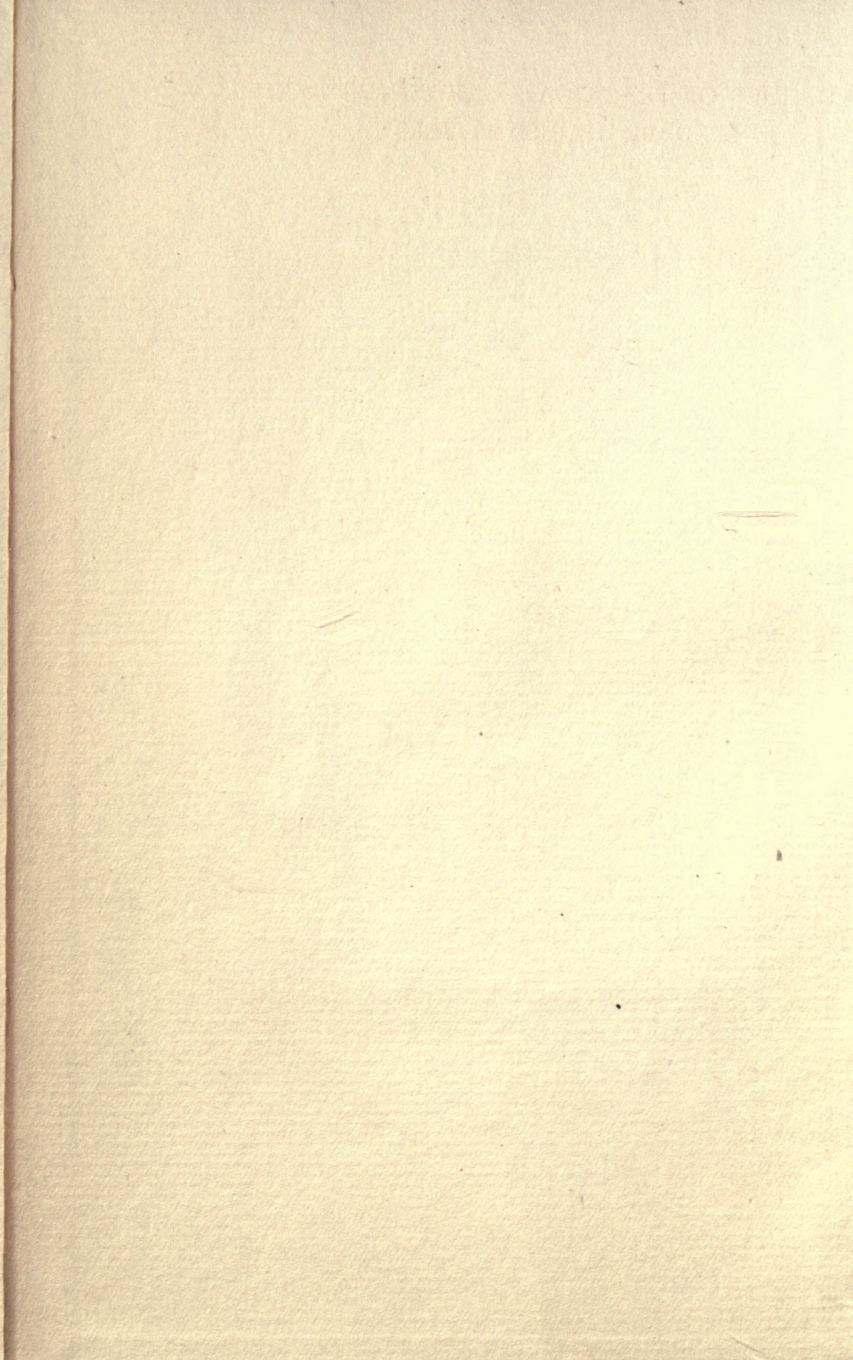




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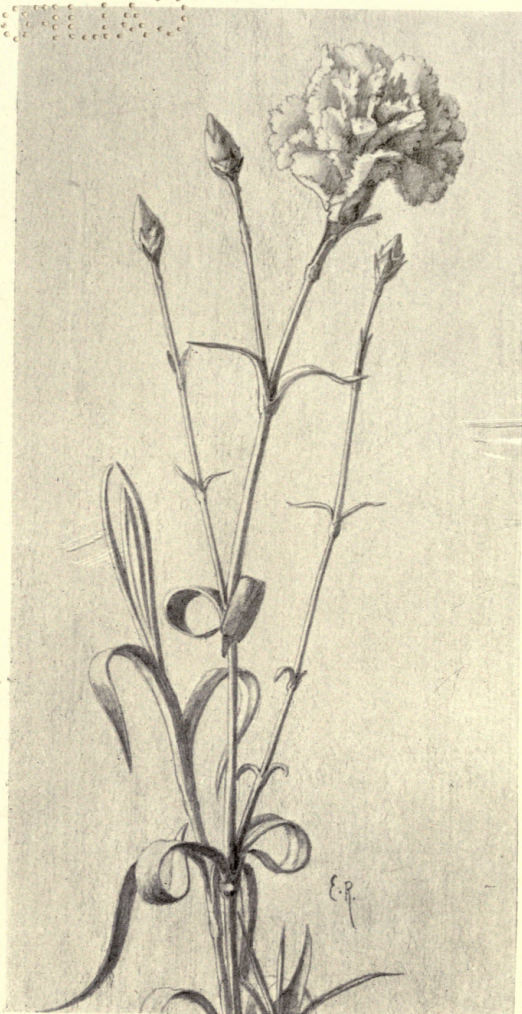


HANDBOOKS OF PRACTICAL GARDENING—XXII  
EDITED BY HARRY ROBERTS

THE BOOK OF THE CARNATION







CARNATION, FLORIANA



THE BOOK OF  
THE CARNATION

BY

R. P. BROTHERSTON

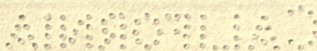
TOGETHER WITH A CHAPTER ON  
RAISING NEW CARNATIONS BY  
MARTIN R. SMITH

JOHN LANE: THE BODLEY HEAD  
LONDON AND NEW YORK. MCMIV

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WILLIAM CLOWES AND SONS, LIMITED, LONDON AND BECCLES.



## PREFACE

THERE may be those who will think that if remarkable for anything, this little book is remarkable for its omissions. The writer himself feels that to be so, but the exigencies of space have formed an inexorable barrier, and he can only hope that, as far as it goes, the matter contained in its pages will be found helpful. It will be noticed that Picotees culturally have been merged in Carnations. The history of the various sections of popular Dianthi has received more attention than it usually receives. The position held by the Gilliflower in folklore, *e.g.* its connection with old-time love affairs, and with the Blessed in Paradise, has, however, regretfully been passed over for lack of space.

Thanks are very largely due to the many gentlemen who have kindly responded to inquiries made as to special questions that have arisen in the course of writing the book; and also to Dr. Masters for permission to make use of articles contributed by the writer to *The Gardener's Chronicle*. The Editor asks me to express our indebtedness also to Mr. James Douglas for the loan of some interesting illustrations.

R. P. B.

November 28, 1903.

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*Photo by Henry Irving. By courtesy of Messrs. Cassell*



THE BOOK OF THE CARNATION



# I

## SPECIES OF DIANTHUS

THE genus *Dianthus* belongs to the order Caryophylleæ, of which it is the chief member, other well-known members of the same order being *Silene*, *Holostea*, *Cerastium*, and *Lychnis*. *Dianthus*, a classic designation, "Flower of the gods," utilized by Linnæus, forms a very large genus of plants, more than two hundred species having been described. These inhabit mostly the temperate zone, but extend to colder and also to hotter regions. They are largely evergreen perennial plants, but a few are biennials, and some, dwarf shrubs. With one or two exceptions, all may be cultivated in the open air in the British Isles; but as garden plants the species worth cultivating are not many; and with the Carnation, Pink, Sweet William, Indian Pink, and a small selection of Hybrids, the following may be accepted as comprising all that are worthy:—

*D. aggregatus*.—A large flowered pink variety introduced in 1817. The plant grows one foot in height, and flowers in summer. About 1832, there was a double variety of this in cultivation as well as the single. The type is figured in Sweet's "British Flower Garden," vol. ii. p. 166.

*D. alpestris* was introduced in the same year as the last-named. It grows in Alpine pastures, and rarely grows higher than six inches. The flowers are red.

*D. alpinus*.—This is one of the loveliest rock plants ever introduced, though by no means the least exacting under

cultivation. Indigenous to the Austrian Alps, it was first brought to England in 1759, but for a long period was found in botanic gardens only, its lowly, unassuming habit unfitting it for a place in eighteenth-century flower gardens. It is figured in the *Botanical Magazine*, t. 1205. The plant where it thrives spreads into large masses, the flowers rising just above the foliage, and two to four inches above the soil. The foliage is a shining dark green, which in June and July is completely hidden by the flowers. The flowers are rose-coloured, spotted with crimson, with an inner ring or "eye," the margins of the petals being crenated. A variety of soils suited to the plant, ranging from peat to loam, has been prescribed by cultivators. It is certain it favours a deep soil always moist, but the plant itself to be so placed as to escape damp or stagnant moisture settling among the minute cushiony foliage. As a pot plant it is easy to manage, and those who experience a difficulty in doing it well on the rockery, should try it, as also *neglectus*, *cæsius*, and others of the same type, which, cultivated thus, succeed in cold pits or garden frames. The plant fortunately is not shy of increase, cuttings slipped off with a heel and inserted in a sandy compost in properly drained flower-pots emitting roots with fair success. The cuttings must be kept closely shut up in a cold frame till roots have been formed. *D. a. ruber* is a supposed hybrid between *D. neglectus* and this species.

*D. arenarius*.—A dwarf European species of no great beauty. It is figured in the *Botanical Magazine*, t. 2036.

*D. asper*.—This is a pale-flowered low-growing species, introduced from Switzerland in 1882. (Syn. *D. scaber*.)

*D. atro-rubens*.—A small-flowered species that grows about a foot high. It carries very dark-red flowers in heads, and was introduced from Italy in 1802. A figure will be found in the *Botanical Magazine*, t. 1775.

*D. barbatus*.—The type from which the Sweet William

is derived. From the botanist's point of view introduced in 1573, but an English garden plant previous to that date.

*D. bicolor*.—This species is so named on account of the undersides of the petal being leaden-coloured, the upper portion being white. The plant was brought from Tauria, in South Russia, in 1816, and grows to a height of one foot or more.

*D. cæsius* is our English representative of the Alpine species. It is found only on limestone rocks at Cheddar, in Somersetshire, hence called the Cheddar Pink, and on old walls near Oxford, the flowers of the Oxford variety being somewhat larger than the Cheddar form, and is known as the Oxford Pink. There is a still larger flowered variety called *D. c. grandiflorus*, but the colour is not so deep a rose as in flowers of the others. In Ray's "Synopsis," the species is said to have been found growing in the North of England, as well as on "Chidderoks." It is not difficult to cultivate, and, even when flowerless, the plant, on account of its densely glaucous-grey foliage—whence its name, "Cæsius"—is an object of interest. As a pot plant, if plenty of lime rubbish is mixed in the compost, it succeeds well; and it is, indeed, a commendable practice when introducing plants to a rockery to establish them previously in pots. The plant abhors moisture clinging about the foliage and stems; an ideal situation being on the face of a stone or an old wall. We find it first designated the "Mountain Pink," and on account of the colour of its foliage Miller named it *D. glaucus*. The Cliff Pink is another of its common names.

*D. callizonus* is a somewhat late introduction from Transylvania, and flowered first at Kew about the year 1890. The flowers are much larger than those of *D. alpinus*, brightest rose in colour, or rosy purple, with a zone of deep crimson surrounding the centre, which is whitish. The habit of the plant partakes more of that

of *D. plumarius* than of the Alpine pinks. It grows rapidly, presenting no fastidiousness in regard to cultural requirements, though it prefers a fertile soil with shade. It is propagated by means of cuttings in the same way as *D. alpinus*. A beautifully coloured plate of this lovely flower appeared in *The Garden*, vol. lx.

*D. Carthusianorum*.—A German species allied to *D. barbatus*, and interesting as the supposed plant that was largely cultivated as long ago as the sixteenth century by the name of "Sweet John," or simply "Johns." The name occurs in Lily's "Euphues and his England," along with several others, common flowers, roses, violets, primroses—"here wil be Jilly-floures, Carnations, Sops-in-Wine, Sweet Johns," and it is described in all the old herbals. Wright quotes a stanza that shows it to have been a dearly loved flower.

"The John so sweete in showe and smell,  
Distinct by coloures twaine,  
About the borders of their beds  
In seemlie sight remain."

Like the Sweet William, it was a common garden plant long previous to the date noted by botanists as that of its introduction, 1573. Miller states, the "plant had gone out of cultivation in his day;" but traces of it are to be found till the end of the eighteenth century. The type is figured in Sweet's "British Flower Garden."

*D. Caryophyllus*.—A little-known species, but interesting as the type which produced our long race of Carnations and Picotees. The specific name is one of the many applied long ago by old botanists to Carnations and Pinks. It is figured in Sowerby's "English Botany."

*D. caucasicus*.—A good garden plant, with large pink flowers and dark centre, growing about a foot in height. Introduced in 1803, and figured in the *Botanical Magazine*, t. 795.

PLANT  
CULTURE



*D. T. Fish*

CHEDDAR PINK—DIANTHUS CAESIUS

*Photo by*

1911

1911

1911



*D. chinensis*.—A red flowering species from the East. Figured in *Botanical Magazine*, t. 28; see "Annual Pinks," p. 47.

*D. cinnabarinus*.—This is a distinct species, with cinnabar red flowers dying off to carmine. It produces flowers abundantly, and requires no special treatment.

*D. corymbosus* is a pink-flowered species peculiar in the blue-tinted anthers it produces.

*D. cruentus*.—This is a Russian plant, not so desirable as *D. atro-rubens*. It produces its flowers, which are deepest crimson, in small crowded heads, which are rather showy. The habit of the plant is very straggly.

*D. deltoides*.—The Maiden Pink, and one of our prettiest indigenous flowers. The type is rose-coloured, with a dark circle, or eye; but a white form is not uncommon, and on Arthur's Seat, near Edinburgh, a variety with white flowers and purple markings is found. This was supposed to have been a distinct species when first discovered, and was named *D. glaucus*, a name it still retains with the type designation added. The plant presents no cultural difficulty, and is easily propagated from seeds, and by division in autumn. Its name, Maiden Pink, is said by old herbalists to have been given it because one flower only was borne on each stem. It was also called the Virgin Pink and Small Honesties.

*D. dentosus*, the Amoor Pink, is a dwarf-growing species from Russia. The flowers are pretty, of a violet shade and with a darker centre. The plant begins to flower in early summer, and continues in beauty till autumn. It requires no special treatment, and is increased by means of seeds.

*D. discolor* produces large handsome flowers of a pink shade, its petals serrated. The throat is white and brown spotted. It is a Caucasian plant, and is figured in the *Botanical Magazine*, t. 1162.

*D. ferrugineus* is a pale-flowered species of compact

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habit, introduced from Italy in 1756, and figured in Miller's "Figures of Plants." It is still worth growing as a variety. Of this there is a sulphur-coloured form, which about sixty years ago was known as the "Yellow Pink."

*D. fimbriatus*.—A suffruticose Iberian species formerly cultivated under the name of *D. orientalis*, and so figured in the *Botanical Magazine*, t. 1069. The flowers are fimbriated, rosy in colour; well worth cultivating.

*D. Fischeri*.—There are two species known by this name. One, the true species, was introduced from Russia in 1820, and is figured in Sweet's "British Flower Garden." It grows a foot or more in height, with two or three flowers in a head, and seems to possess an affinity to *D. superbus*. The flowers are red, but at one time a white-flowered variety was in cultivation as well. The other is a supposed variety of *D. neglectus*, with more than one flower on each stem, and is altogether more robust than that species. It is generally cultivated as *D. Fischeri*.

*D. fragrans* is an Austrian species brought to England in 1804. It is white-flowered, tinted with purple, with fringed petals, and emits an odour of jasmine. Of this there is a double variety.

*D. Freyneri* is a tiny form growing only two inches above the ground. It requires a limestone or chalk soil, and is of recent introduction.

*D. gallicus*.—A dwarf, pink-flowered species from the Continent, growing in quantity on the sands at Biarritz and elsewhere. It is apt to die prematurely under cultivation; Wooster's "Alpine Plants" contains a figure.

*D. giganteus*.—A purple-flowered Grecian species introduced in 1828. The plant varies considerably in height, but is never less than two feet, and sometimes four feet high. It is a cluster-flowered species.

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100



*D. T. Fiss?*

DIANTHUS DELTOIDES PULCHELLUS

Photo by



*D. glacialis*.—A native of the mountains of South-Eastern France, and a very difficult plant to cultivate, continual wetness at root being essential to its health. It was introduced in 1820. A supposed hybrid between the above and *D. alpinus* is usually cultivated in gardens as *D. glacialis*. It flowers in April, and is a desirable species.

*D. hispanicus* is a very slender-stemmed species, with deep crimson flowers an inch and a half across.

*D. Holtzeri*. A species from Turkestan that seems to possess many characteristics of *D. superbus*, but with darker flowers.

*D. Knappi*.—A late introduction, growing nine inches in height, possessed of flowers of a clear pale yellow, and partaking of the character of *D. liburnicus*.

*D. latifolius*.—Much like *D. barbatus*, but larger both in flower and foliage. It is figured in Sweet's "British Flower Garden."

*D. liburnicus*.—A strong-growing plant, producing its red flowers in heads. Leaves and stems are glaucous, hence one of its names is *D. glaucophyllus*, and it is not uncommonly cultivated as *D. Balbisii*.

*D. monspessulanus*.—A good border variety, introduced in 1764. The flowers are red with petals much lacinated.

*D. neglectus*.—One of the *D. alpinus* group, but more beautiful than that species, with foliage somewhat like that of *D. cæsius*. The underside of the petals are greenish-blue. It blooms earlier in the year than *D. alpinus*, and sometimes succeeds where the last-named fails. It grows on the Mont Cenis Alps, and was introduced in 1869. Treat as *D. alpinus*. *D. neglectus albus* is a rare white form.

*D. pallidiflorus*.—A showy pale-flowered species from Siberia. It is late flowering, and is suitable for the rockery. *D. pallens* is a synonym.

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*D. Pancici* is a tall-growing plant, attaining four feet in height, and produces flower-heads of a bright crimson purple.

*D. pennsylvanicus* is a variable species, abundant in New England, where it is known as the May Pink.

*D. petræus*.—This species is much like *D. fragrans*, but having somewhat larger fringed flowers, which are white. The *D. petræus* of the *Botanical Magazine*, t. 1204, is pink-flowered.

*D. pinifolius* belongs to the *D. crenatus* type, though scarcely so fine as that species. The foliage is somewhat like that of the pine tree. It is native to Greece.

*D. plumarius*.—The Feathered Pink, or Pheasant's Eye, is interesting as being the reputed parent of the numberless race of Garden Pinks, of the Black and White Pinks, and of the Laced or Florist varieties. The double form and the double white, as well as a large variety of the latter, are very old plants, the two first-named appearing in Parkinson's "Garden of Pleasant Flowers." Botanical works fix the date of the introduction of the species in the year 1629, but it is clear the plant was cultivated in England long previous to that date. Gerard knew it well. The type-plant is remarkable for its variability from seed, and a few special varieties have been perpetuated by cuttings. In any form it is a desirable garden plant, and, on account of its fragrance, a delightful flower for cutting. One of the latest forms appeared a few years ago as "Cyclops." The plants varied considerably, but all were alike beautiful. About the year 1890 *D. plumarius hybridus* was first seen. This kind possesses stout erect stems, with large blooms of a soft rosy tint, and with a crimson zone. *D. p. annulatus* is an older form of the same type. *D. moschatus* and *D. dubius* are synonyms of the type, which grows wild in England on old walls, though not truly indigenous; yet Ray notes how common a wild plant it was in his time.

*D. prolifer*.—This is a very rare English species, confined to Selsey Island and a few more stations, and known to the old botanists as the Childing Sweet William.

*D. Seguierii*.—A hardy species from Switzerland, with rosy-purple flowers, and suited to border cultivation.

*D. S. collina* is a lovely variety that flowers in autumn.

*D. splendens*.—A medium-sized flower of a deep crimson colour.

*D. squarrosus*.—A species somewhat like *D. plumarius*; from Tauria in Russia, 1817. The flowers are white, and larger than those of the latter species, but the plant less tall.

*D. suavis*.—A very sweet-scented pink-flowered species with glaucous foliage. Suited for rockwork.

*D. superbus*, commonly known as the Fringed Pink. It is a very old species, being mentioned in Gerard's "Catalogue of Plants" (1596), where it is called "Spotted Sweet Johns." By Parkinson it is named the "Feathered Pinke of Austria," and he remarks it is "like unto the Sweet Johns—some of them of a purplish colour, but the most ordinary with us are pure white and of a most fragrant sent, comforting the spirits and senses a farre off." The flowers at night emit the most delightful fragrance. The plant grows as high as two feet, and is very floriferous; and though perennial it is apt to die during winter when grown in rich garden soil. It is, however, easily raised from seeds, which sown in April or May produce strong flowering plants the year ensuing. The species forms hybrids freely, and not improbably a "strain" of *D. superbus* exists in our present-day Pinks, if not also Carnations. *D. s. garnerianus*, sometimes called "*Gardneri*," is a very fine variety, with deeply lacinated flowers over three inches across. It was raised about sixty years ago by the gardener of a Mrs. Garnier, after whom it is named, and is a supposed hybrid with *D. superbus* and an Indian Pink for parents. The flower is

portrayed in the "Floricultural Cabinet," vol. viii. *D. s. chinensis* was derived from seeds gathered by a missionary in China about 1898. The flowers are mauve flushed with rose, with narrow petals deeply cut and fringed. It sometimes flowers in the open till mid-winter. A coloured plate will be found in *The Garden*, vol. lv. *D. Oreades* is a synonym. *D. s. nanus* is a dwarf form of the European type that comes true from seeds.

*D. sylvestris* is a species with red flowers not unlike those of *D. Caryophyllus*, and with long slender stalks. It was introduced in 1732, and is figured in the *Botanical Magazine*, t. 1740. It is one of the several species called *D. virgineus*. *D. Boissieri* is a large and curious form growing two feet in height.

*D. tener*.—As in so many other instances this name has been applied to two plants, the one a form of *D. alpinus*, but true *D. tener* belongs to the plumarius group, and is of a straggly habit of growth.

*D. virgineus*.—What is now known by this designation was introduced in 1816 from the Continent. Its flowers are red and of no great beauty. *D. deltoides* and several other species have been at one time or other so-called.



## II

# HISTORY OF THE CARNATION

THE early history of the Carnation is, unhappily, involved in obscurity, the very earliest record of the plant dating no further back than the beginning of the sixteenth century, when Bishop Douglas mentions it among other garden flowers. "Jerafleris" no doubt occurs even earlier in "The King's Quhair," and Chaucer has been cited as proving the Carnation to have been cultivated in the reign of the Third Edward; but all good authorities concur in identifying Chaucer's plant with the clove-tree of commerce. It is, however, safe to assume that the Carnation was in cultivation much earlier than we are able to trace by any written record, and not improbably it was no uncommon plant. Turner's remark in "Libellus," where he calls it Incarnation, favours that supposition. In a report recorded in "Hakluyt," and written in 1568, the word referring to the plant occurs as if in common use. Hill, in the "Proffitable Arte of Gardening" (1574 ed.), describes its cultivation as if he were cognizant of the idiosyncrasies of the plant, in the contents calling it a "Gilifloure and Carnation." Tusser might also be mentioned, and Lyte, as early authorities; but it was not till Gerard published his "Herbal" in 1597 that the extent to which the Carnation was cultivated, and the great number of varieties that were at that time grown in gardens, can be fully gauged. It then bursts suddenly upon our ken a fully developed flower, already

divided into two distinct sections, the plants in which differed from each other in habit of growth and in cultural requirements, but alike in the remarkable range of colours embraced in each. Peacham remarks that new varieties were introduced from Italy, but Gerard's declaration that "every clymate and countrey bringeth forth new sortes" is no doubt more consistent with fact. There is evidence showing two distinct types to have been early in cultivation in South-Western France, and in Silesia yellow- and apricot-coloured Carnations were so common that Clusius mentions them being sold in the market of Vienna. This type of Carnation exercised a powerful effect on Carnation-culture in England. Previous to its introduction there had existed the greatest difficulty in securing seeds off English-grown plants; but these, what we would now call yellow grounds, proved prolific seed-producers, and at the time John Parkinson wrote his "Garden of Pleasant Flowers" in 1629, English-raised varieties were fairly numerous. Parkinson was the first to attempt a rough classification of the plant, calling those with large flowers—and, be it remembered, some were as large as expanded damask roses—Carnations; the smaller and commoner varieties, Gilliflowers; the third section being the "Orange Tawnies," or yellow section. At the time Rea wrote his "Florilege," 1665, the taste in Carnations had undergone a marked change, the old varieties having given place to sorts imported from Holland and Flanders, and which produced flowers somewhat like our Malmaisons. Rea names three sections, red and white, purple and white, and scarlet and white, the flowers in each being "well-striped, flaked, marbled, or powdered." These were cultivated in pots and protected during winter, while the commoner sorts were grown altogether in the open, "set on banks or beds."

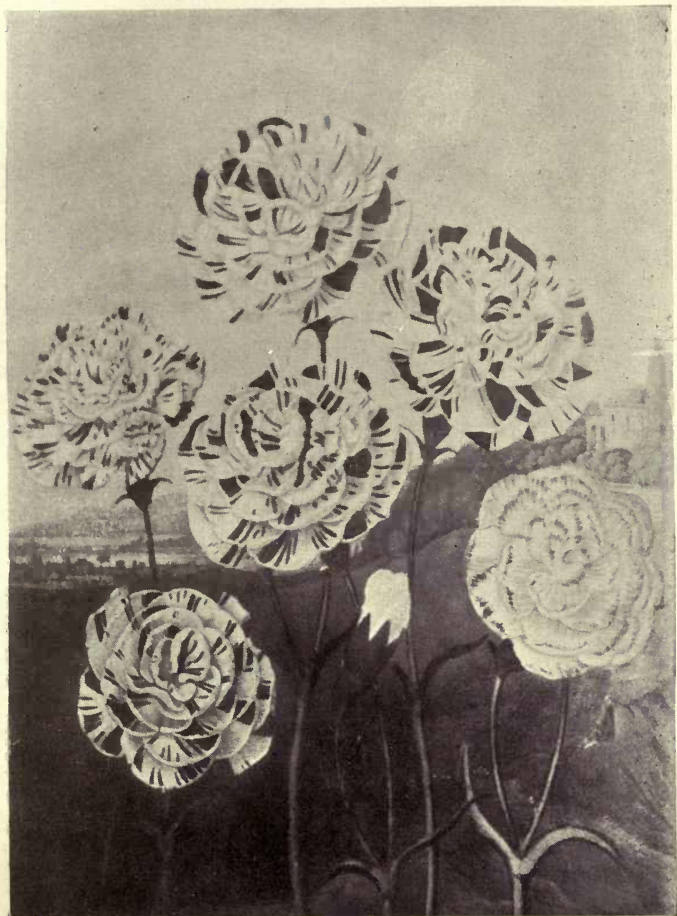
In 1683, Rea's son-in-law, Samuel Gilbert, published "The Florist's Vade-Mecum," in which is recorded

important advances in the flower. In addition to the classes named by Rea, there were also red and blush, blush and white, selfs, tri-coloured, which were obviously yellow fancies, and the very first mention of an edged flower, or as we would now call it, a Picotee. Its name and description is perhaps worth recording, "Fair Helena, only edged with purple." The fashion in large flowers continued to increase, by-and-by to such an extent that those sorts alone were esteemed that produced a double bud, or an inner pod as it was termed, as is sometimes seen in the present-day Malmaison. Very great care and skill was expended on the preservation of the earlier-formed petals, till those on the inner pod were also expanded. The plants cultivated exclusively in pots, were disbudded to one bloom on each. From the fact that seedlings possessed of calyces that split were alone preserved for cultivation, they were popularly known as Bursters, ordinary varieties with whole calyces being called Whole Blowers, these being disposed of in flower borders as unworthy the serious attention of the advanced florist. Shortly after the beginning of the eighteenth century a quite new disposition of the sections occur. These were Piquettes, or Picketees, Flakes, Painted Ladies, and Beazarts, or Bizarres. The last named were still of the Burster type, and it was not until 1740 that the hitherto neglected Whole Blowers ousted these large and coarse varieties from chief position. The new type of flowers seem to have been introduced from France, because they were called also French Flakes. Serrated petals were noted at the same time as a serious blemish, but these were gradually eliminated, and by the end of the century the edges of the petals were perfectly smooth. These changes witnessed also the transference of the unit of perfection from the flower to the petal. The disposal of the marks in Bizarres and Flakes was also subjected to clearly defined rules; and, as a fact, we know

from existing coloured plates of contemporary flowers that a show—variegated, they were designated—Carnation was essentially as it is to-day. Maddocks describes Scarlet, Pink, Purple, and Crimson “Bizards,” Pink and Rose Flakes as the several sections cultivated in 1792. In addition to these “is a sort held in high esteem by cultivators called Picotee, many of which are very beautiful, and, being hardier than the other sorts, are in considerable request. The colours are principally yellow and white spotted.” Picotees at this time had not, however, got beyond petals with “serrated or jagged” edges. To Maddocks belongs the honour of providing a standard for the modern Carnation, a standard more or less faithfully copied by “authorities” for at least fifty years afterwards. Space does not permit a detailed account of the march of the Carnation, and what we still call the Picotee, during the last century. Yellow Picotees it may, however, be remarked, were extremely popular during its first half, and it is only lately that flowers with edges so clearly marked, and with yellow of so deep a tint in the ground as those grown in the thirties and forties, have been produced. The white ground Picotees by the same date had become equally refined. But it is interesting that, so late as 1840, Picotees were in Lancashire still called “stripes.” In the late sixties and the seventies Mr. C. Turner produced many yellow varieties from a well-habited, stiff-growing variety called Prince of Orange; Mr. J. Douglas continued the work, while latterly Mr. Martin R. Smith has brought them into line with the other sections, the German variety *Germania* having latterly been largely used as a stud-plant.

#### THE NAMES OF THE CARNATION

A short *résumé* of names applied to the Carnation seems to be needed, in order to render what has been recorded of its history more complete. Carnation, like



SHOW CARNATIONS AND PICOTEES

*From "Temple of Flora," 1812*

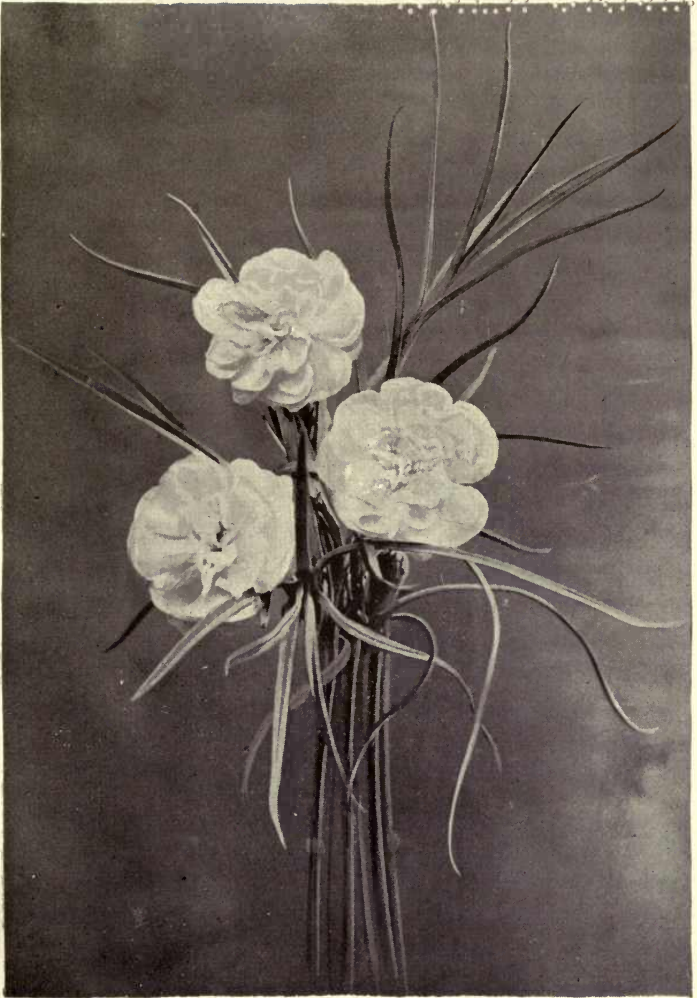


Picotee, is curiously enough not the English name of the plant, but merely an adjective prefixed originally to define a variety or a section. The old English name is undoubtedly Gillyflower, in one or other of its numerous spellings, the consensus of opinion being that this is derived primarily from *Caryophyllus*. Lawson, in 1618, recorded it as July-flower, because it flowered in July, and not a few followed his lead both in the name and its alleged meaning. "Carnation," by all the old writers, was said to be a distinguishing colour name, but the late Dr. Prior, finding in Lyte's "Herbal" and Spenser's "Shepherd's Calendar" the word "Coronation" applied to the flower, thought he had there discovered its earliest form and its true meaning—a flower employed in making chaplets for headwear. However, several instances occur of "Carnation" at an earlier date, and there appears no good reason to doubt that authorities like Gerard and Parkinson were correct in assuming the designation to be one descriptive of the colour of the flower, "Carnation" at that early period being applied to distinguish a deep red colour, and not always the blush tint of the present day. Picotee is easily traceable through many variations to the French Picoté—"la Carnation Picotée," Hogg calls it—and it was always applied to spotted flowers, or to those with the colour splashed on white or yellow. Another old name that continues till to-day is Clove. Just as Carnation-Gilliflower distinguished a large red variety, so Clove-Gilliflower marked one remarkable for its strong affinity in scent to the clove of commerce. The latter, and also *Geum urbanum*, have indeed been repeatedly confused by modern writers with the Clove-Gilliflower, a sweet flower dear to ancient dames on account of its spirit-refreshing perfume. It was also partaken of at great banquets as a kind of pickled salad, and in the reign of Charles II. it is first heard of as being used in a liqueur called clove-gilliflower wine. It may be added that the plant known

to-day as the Old Clove is quite distinct from the "old" one, the latter having been a small flower of neat form. The Painted Lady section is now cultivated by very few in Great Britain, but in Germany it is not at all uncommon. The flowers in this section are composed of petals whitish underneath and coloured above.

At present the Carnation is divided into several sections, of which the following are names and descriptions. Bizarres are distinguished by white petals marked lengthwise with two colours, or shades. These are scarlet, crimson, and pink-and-purple respectively, and all Bizarres are included under one or other of these designations. It has been customary of late years to disparage the artificiality of these flowers, but, especially the scarlet and the pink-and-purple, Bizarres are really beautiful. Flakes differ from Bizarres in having only one colour disposed on a white ground. The colours are scarlet, rose, and purple, and by these names all Flakes are defined. Of late years Sels and Fancies have nearly ousted the above types from gardens, or it might more truly be said, they have forced their way into gardens where formerly Carnations were hardly to be found. Sels have long been cultivated and very much appreciated on the Continent, more especially in France, and thirty years ago, and even more recently, a varied collection of Sels could be procured only from across the Channel. Now, however, English varieties are equally popular with exhibitor and gardener, and all colours it is possible for the Carnation to assume are common. "Self" is equivalent to the French "Uni," one colour or shade only in one flower. "Fancies" include a large variety of flowers, with markings and colours of the most diverse kinds, and as a section it may be said to include all those varieties that cannot be classed in the other section, or with Picotees. Some of the sorts are no doubt bizarre and uninteresting, but





CARNATION—BOOKHAM CLOVE

Small decorative patterns of dots and lines at the top left corner.

others are distinguished by markings and colours that render them fascinatingly lovely. There being no limit to the colours, we find the ground or body colour of all shades, from white and yellow to scarlet, and the markings are disposed without any of the regularity the florist expects in Shows and Picotees. In this section the old Flames (*French*, *Flamand*) are now included, these possessing a red ground barred with a darker colour. The Picotee, as already noted, is simply a form of Carnation. It has now quite lost the distinctive markings that gives it its name—all Picotees, whether white or yellow grounds, having the whole of the petal except a clearly defined coloured margin pure white or pure yellow, any spots or bars being considered a serious drawback. White Ground Picotees are classed as red-edged, purple-edged, and rose- and scarlet-edged according to the colour with which the petals are margined. These, again, are called light, heavy, or intermediate, according to the width of the margin. Yellow Ground Picotees have been so recently brought into line with the others that there has not been time to subdivide them into classes; but the type is now as rigidly and sharply defined as in the White Ground section. "Border" applied to Carnations generally refers to any variety that succeeds well in the open, and which is possessed of certain properties that render it suitable for garden decoration.

Tree, Perpetual or Winter-Flowering Carnations were originally a French strain first cultivated fifty years ago. They are now, however, wonderfully improved on the original type, and included in them are varieties belonging to other sections. Moreover, Italy, Spain, Germany, France and Flanders possess each a strain of Tree Carnations peculiar to itself, and from among these a few varieties have been secured that run alongside later English-raised forms. America, too, possesses a distinct strain, and the best of these are making a rapid conquest in this country.

In addition there are strains of what may be termed Annual Carnations. Such is the French Grenadin, truly a biennial, both single and double, with small flowers of a sweet scent, and extraordinarily floriferous. Marguerites, which sown in spring flower the same year. The flowers are of moderate size, fringed, and very sweet. Allied to these are those termed Riviera Carnations, a form cultivated by cottagers along the Mediterranean, but which has not yet made progress in this country; and last, though not least, the Malmaison section, which is treated of separately (*v.* Chapter V.).

### III

## THE CARNATION AS A GARDEN PLANT

ALL kinds of Carnations and Picotees are amenable to garden cultivation ; even the Souvenir de la Malmaison existing for years in the open air in quite cold districts. In the north of England, and in Scotland, it has long been the practice to cultivate even the more refined forms, such as Flakes, Bizarres, and Picotees, in the open garden for exhibition purposes ; but in treating of the Carnation as a garden plant, I shall keep in mind more particularly its value as a garden flower. Broadly, there are two courses open, either to cultivate solely in the open, or to preserve plants under glass protection during winter and to plant in spring. Of the two the former yields much the better results, the vigour of the plant being enhanced and its floriferousness vastly increased. But it is essential that layers (*v.* Chapter X.) be put down at the earliest moment, the middle of July being quite late enough, so that nicely rooted plants may be ready for planting any time from the end of August till the middle of September. These rapidly become established at root, and though little top-growth follows, which, indeed, is not wanted, a Carnation that is overtaken by winter having a firm grip of the soil is proof against upheaval by frost and is little affected by the cutting winds of March. Following that, the plant is in a position to respond at once to the revivifying influences of genial weather, and at every joint young shoots are

produced, which develop into flower-stems, so that instead of the usual one or two stemmed plant, we secure one with eight to a dozen flower-stems. The inexperienced, however, must be warned against permitting early layered plants to stand too long after root action has fairly been accomplished. The result is widely dispersed roots, which have to be broken when lifted for transplanting, so giving one of those cheeks to growth which is invariably inimical to the well-being of the Carnation.

The position selected for the beds is of much importance. Let it be as elevated as possible, dry underneath, and open to sun and air. It will be found better rather to have the beds in open vegetable quarters than in borders confined by low trees. As to soil, the plant is not inadaptable, and it succeeds in all kinds, so long as that which is too heavy is lightened to meet its requirements. Manure, as a rule, ought not to be applied to soil for the Carnation itself, any stimulant of that nature being better introduced for a previous crop. At the same time, that is not always convenient, and therefore to meet its wants the manure employed should be thoroughly decayed, broken up finely, and as evenly and regularly mixed as possible with the soil in course of digging. Fresh earth is, of course, always valuable, and in the case of very heavy soils, leaf-mould and sand freely incorporated with the upper six inches is of much value. Generally, too, a bed raised a few inches above the level of the surrounding soil is better than one on the flat, and in forming the bed, let it be somewhat convex. The Carnation likes a rather firm-rooting medium, and therefore previous to planting, and while the soil is dry, have it firmly compressed by trampling.

It often happens that plants cannot be put into the positions chosen for them until spring, and in such cases they must be wintered under glass, either in cold frames or in pits. Under these conditions it is commonly advised



*Photo by*

*Henry Irving*

A CARNATION WALK IN MR. MARTIN SMITH'S GARDEN

*(By courtesy of Messrs. Cassell)*

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to plant a pair of Carnations in a three-inch pot, but considering it is frequently impossible to plant out until April, when growth has some time commenced, it is apparent that pots of the above dimensions are deficient in capacity. Other good growers select four-inch pots, placing one, two, and three layers in these, and the results are invariably more favourable. The very best results, however, are secured by selecting very strong layers which, potted early in September singly in five-inch pots, are little inferior to plants set out in early autumn. The winter treatment of plants in pots calls for a low temperature, abundant ventilation, and no applied moisture, either at root or in the atmosphere. If rust or spot appears, it is essential that the parts affected be removed as soon as noticed, and forthwith destroyed, and flowers of sulphur distributed over the plants and their surroundings. With the advent of spring, the soil in the pots will require moistening from time to time, but refrain from applying water freely. Abundance of air is also essential, and green fly must be watched for and destroyed. It is usually April before transplanting to the open can be effected, and it may be remarked that the soil for these may be, to some extent, more enriched than for layers rooted in autumn. Let the soil, however, be made quite firm, and in planting, do not sink the plant any lower than it stood in the pot, deep planting being always resented, more or less, by the Carnation. There are various ways of arranging the plants, the simplest being in rows with the plants singly at a foot to fifteen inches apart. When the plants are not very large they are sometimes arranged in threes, planted a few inches apart, with fifteen-inch intervals between the triplets. Wintered in pots one has to treat them according to the number in each. The early summer treatment of each set is identical: repeated stirring of the surface-soil, applications of soot and pigeon-manure, or superphosphate

of lime, and the removal of the weaker growths when these are produced too abundantly on vigorous plants, embrace the main points. By-and-by stakes, either of bamboo or the coil-iron stake, so popular of late years, must be placed one or more to each plant before the flower-stem has grown many inches. Sometimes it is necessary to apply water in May, for it is a curious feature of the Carnation that though it abhors moisture during the winter-season it, on the other hand, languishes if it is not applied in dry weather during summer. If water is repeatedly called for, it ought not to be given pure, but superphosphate, or some other stimulating material added. During genial summer weather, the flower-stems make rapid progress and the little buds not infrequently become infested with green fly. A little tobacco-powder dusted over these effects a speedy clearance, which is important, not so much on account of the harm the insects effect, but because, if permitted to remain, tomtits are almost sure to discover them, and while dining *al fresco* break over the stems to the great loss of flowers by-and-by. Ordinary garden Carnations are generally not disbudded, but when the more refined types are thus cultivated, *e.g.* Bizarres, Flakes, and Picotees, disbudding is essential, and also, it must be said, a previous thinning of the flower-stems. Disbudding is a more difficult-looking business than it really is, particularly if the buds are removed while still small, when a nimble-fingered operator will disbud a very large collection in the course of a few hours. The method consists in grasping each bud to be removed between finger and thumb, then give it a quick upward jerk, when it comes easily out of its socket without in any way damaging those left. Three buds left to expand on each stem is the greatest number permitted by growers of exhibition flowers, but that number may well be exceeded where the terrors of the exhibition table do not loom in the near future.

Hitherto, these remarks have been confined to Carnations cultivated by themselves for bloom, but as garden flowers they are also no mean objects from a decorative point of view, and the requirements of the present day demand that a carpeting of some brighter material than their own grass or foliage be provided. As a rule, Carnations arranged in this way cannot be planted till late spring, and it may be said, once for all, that weakly plants, either constitutionally so, or those starved in too small pots before planting-out, can never give satisfaction. Whether in beds by themselves, or in borders of mixed flowers, at least, twenty-five plants of a sort should be employed, a greater number being, of course, preferable. It will be found a great mistake to set the plants too close together; from eighteen inches to two feet apart being not unsuitable distances. The varieties that conform to this style are necessarily limited in number, first because we must have effective colours, and also because the plants must possess as nearly as may be a stiff upright habit of growth, while being at the same time abundantly floriferous. A new variety, however promising it may be, should not, therefore, until proved, be employed for decorative effects.

The plants commonly used as a carpet to Carnations are various kinds of Violas. Personally, I dislike these for this purpose, because they are never quite satisfactory, and so dispense with them altogether. Moreover, the list of suitable plants is so large that there is no excuse for employing any but the very best. Verbenas in purple, white, and scarlet, and the lovely pink variety, Ellen Willmott, cannot, perhaps, be surpassed for the purpose in view, each plant carpeting a large surface. The flowers remain bright until the end of the season, and the colours go well with Carnations. *Verbena venosa* and the old *V. Melindres splendens* are also suitable. Another charming plant will be found in *Cuphea*

*strigillosa*, the varieties of *Brachycome iberidifolia* are also satisfactory, and may be employed either mixed or in colours, white being very pretty. Sweet Alyssum is fairly satisfactory, though not nearly so much so as its variegated form. *Gazania splendens*, dark-flowered Heliotrope; *Erigeron mucronatum*, and Madame Crouse Geraniums, afford other selections. It needs hardly be remarked that layers must not be expected from Carnations arranged in this manner, and they must not be planted where either hares or rabbits can reach them. Varieties suitable for grouping include, Mephisto, deep crimson; Comet, crimson; Hon. Adele Hamilton, clear pink; Hildegarde and Trojan, white; Sir R. Waldie Griffiths, deep apricot; Asphodel rose; Loveliness, light salmon-rose; Barras, scarlet; Dundas Scarlet, pure scarlet; Jeannie Deans and Cecilia, yellow; Chloris and Henry Falkland, yellow grounds; Raby Castle, salmon. A new variety, in colouring like Mrs. R. Hole, but of improved habit and apparently of better constitution, will be found in Francis Samuelson.



Photo by

ONE OF MR. MARTIN SMITH'S CARNATION HOUSES

(By courtesy of Messrs. Cassell)

Henry Irving

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## IV

### THE CARNATION IN POTS FOR DECORATION

CARNATIONS and Picotees are extensively cultivated in pots for two purposes. The florist finds the plant in many respects more conformable to the particular kind of cultivation necessary to the production of exhibition blooms when cultivated in pots, though, as already stated, in the northern parts of the kingdom, culture in the open garden is largely conducted in the case even of these. Not so long ago only show Carnations and Picotees were cultivated in this way; but, during the past few years, classes for selfs and fancies and for the novel yellow-ground Picotees having been provided at exhibitions, these also have been included among the florist's treasures and catered for as pot plants. The other purpose for which they are produced in pots is for conservatory furnishing, and for the production of flowers for cutting during the summer months, gardeners, as a rule, confining themselves to a few reliable varieties, but occasionally a varied collection is cultivated. The essentials as to cultural routine in both cases are very much the same. Propagation is almost wholly by means of layers, which are generally "put down" in the pots in which the plants are growing. Not infrequently as a result of the close shading, to which the plants have been subjected on account of the flowers, the shoots become etiolated, and by no means of a satisfactory type. Withered foliage has first of all to be cleared away, the growing points dusted

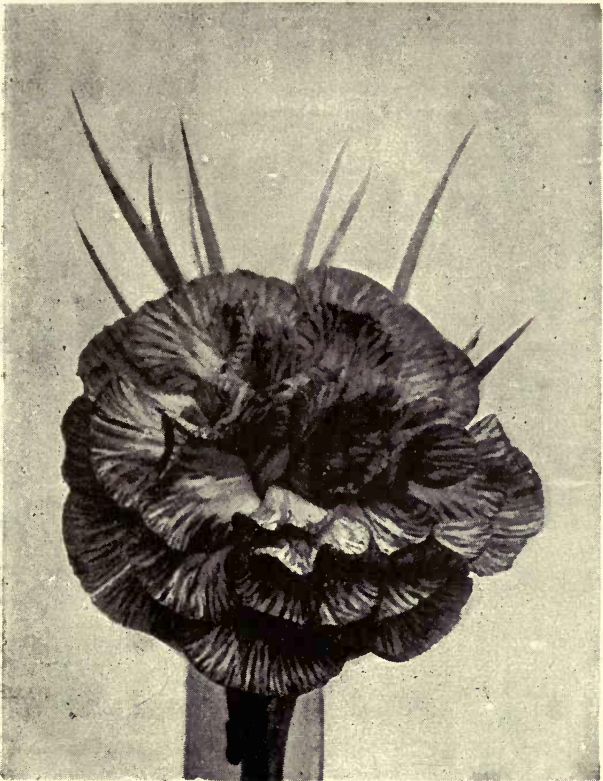
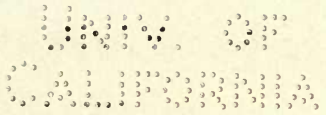
with tobacco-powder to destroy any green fly lurking on the young foliage, and if rust shows, the tips of the leaves cut off. The soil next the inside of the flower-pot is then stirred with a pointed stick, a little sandy compost added, the tongues (*v.* Chapter X.) made, the stems twisted to enable the layer to be brought down, and each neatly arranged so as the whole forms a circle just inside the rim of the pot. A practice common among gardeners is to layer the shoots in the open. For this purpose a piece of vacant ground on a warm border is chosen, each plant to be propagated is then turned out of its pot and plunged sufficiently deep in the soil to bring the shoots to its level. It facilitates operations when the layers are made previous to plunging the balls in the soil. A compost of sandy peat, or sandy leaf-mould should be at hand, and a little of this mixed with the soil to hasten root action. Layers treated in this manner produce healthier and more sturdy plants than those operated in pots and kept under glass to form roots. The latter practice, however, can be commended when the layers are made as soon as the shoots are fit, these yielding quite a different class of plants to those left till the blooming season is over. It not infrequently occurs, too, that splendid material for pot-culture is secured from layers produced from healthy plants grown in beds or borders in the open. In any case the inexperienced must bear in mind that a strong, healthy layer, to start operations with, is worth any extra care expended to secure it.

It will be more convenient to treat of the Carnation for ordinary greenhouse decoration previous to enlarging on the florist sections. A good selection for this purpose will include: Cecilia, a grand yellow; Barras, scarlet; Lady Hermione, rose; Agnes Sorrel, maroon; Sir Bevys, crimson maroon; Benbow, buff; Ensign, blush; Herbert J. Cutbush, glowing scarlet; Lady Mimi, deep pink; Anne Boleyn, salmon; Loveliness, salmon-pink; Hildegarde, white; Mephisto, small bloom, deep crimson;



Miss Ellen Terry, very large white ; Lady Nina Balfour, blush ; while Duchess of Fife is usually grown on account of its lovely pink-tinted flowers. The above are self flowers. Of fancies, mostly yellow grounds, Amphion, Lord Justice, Hidalgo, Charles Martel, Falca, Eldorado, Paladin, Ormonde, Brodick, Dalgetty, a white ground ; Galileo Goldylock, Guinevere, and Duchess of Roxburghe, form a reliable selection. At one time I cultivated the above class of Carnations solely in six-inch pots, one plant in each. The newer sorts, however, grow more vigorously than old varieties, as, for example, is the case with Cecilia, and for single plants seven-inch pots are most generally employed, while, for larger and more imposing specimens, two are grown in eight-inch and three plants in eight- or nine-inch pots. Starting with the well-rooted layer, which should be ready to transfer to pots during the first ten days in September, the stronger growing sorts, *e.g.* Cecilia, Barras, Hildegarde, and Loveliness, will require pots five inches in diameter, while those of the type of Hidalgo, and Mephisto will succeed better in those four inches in diameter. The pots, as in every instance, must be efficiently drained, nothing being better for this purpose than potsherds, broken into very fine pieces, to be placed above a flat potsherd laid over the hole for drainage. The soil may be good fibrous loam with a third of leaf-mould, and one-sixth of sand added, and in potting be careful not to lower the stem of the plant, while the soil must be made moderately firm. Strong plants should be steadied by means of a short stick placed to each, and instead of standing the pots in the open air, I greatly prefer to place them at once in a position where they can be protected from heavy rains, and consequently treated as to water at root in the most careful manner. The plants must, indeed, be supplied with water in quantity only sufficient to keep them in a healthy condition without stimulating growth, while during

the winter season the supply must be stopped altogether. This does not cause a cessation of root action, nor, indeed, of a certain amount of activity in the plant itself, for examination shows that new roots are being produced all the winter long, and to the experienced eye the stem of the plant at the same time increases in bulk. With the advent of February, preparation must be made to afford the plants more room at root. Seven-inch pots for those to be grown singly, and larger ones, as above noted, for those to be grown in triplets, and in twos, being clean washed and drained in the manner indicated for the layers. Potting soil, as a rule, is prepared in advance, the material, if it can be procured, being coarsely broken rotted turves, with leaf-soil, a little thoroughly decayed manure, some artificial manure, and sand to render the whole open. A compost that suits Geraniums, Fuchsias, and the general type of soft-wooded plants may indeed be safely employed for Carnations of the class under review. In repotting be careful not to break the ball or meddle with the roots, and ram the soil somewhat firmly home. Be also exceedingly careful for a while in the application of water, so as not to over-moisten the new compost; but once root-action has begun freely, and especially if the weather is warm, water must not be stinted. If there is a freely ventilated cold pit in which to grow the plants they will succeed perfectly; next to that a cold frame must be made the most of, but as the reason for growing the plants in this way is to secure an earlier bloom, anything that retards growth is regrettable. Staking the advancing flower-stems, applying manure as required, with attention to the early destruction of insect pests, are the chief items the cultivator has to see to. Once the buds begin to open a light shading is necessary, and superfluous buds should be removed at an early stage of growth. Lovely blooms, bright in colour and of large size, are secured under the treatment just noted.



FANCY CARNATION—REGENT



## THE CARNATION FOR EXHIBITION

Large numbers of Carnations and Picotees are cultivated in pots, as already stated, solely to produce flowers for the exhibition table—the cultivator having these under control in a degree that he does not attain with those planted in the garden. The treatment generally is as recorded for those cultivated for decorative purposes, with the difference that the florist true and simple does not cultivate for quantity, but for those qualities that many generations of past florists have stereotyped past change. There is always an abiding distinction between a gardener and a florist, inasmuch as while the former with a due amount of care and knowledge produces a crop of bloom, the latter has to exercise a rare amount of judgment to secure the end he has in view, for unlike the mere gardener who cultivates to produce flowers and plenty of them, the florist, taking the petal as the unit of perfection, devotes his energies to produce a few blooms composed of petals as near as possible to the standard of perfection. There is, indeed, as much difference between the two cultivators as there is between the fisherman who drags the river with his net and hauls out all and sundry of the finny tribe, and the follower of Izaak Walton, who, using his bait as though he loved him, stalks his fish, and hooks and lands it. The one has the greater pleasure, the other the greater spoil, and so whosoever desires to become a cultivator of the show Carnation and Picotee, must be content to act the part of the man who woos Nature by other than forceful means. From these remarks it will be apparent that while absolutely healthy and robust plants are essential, the treatment must in some respects vary considerably. The florist treats his plants during winter in exactly the same manner as described, but he is invariably most particular as to the composition of his potting soil, and as to the time the plants are set

into their flowering-pots, which are, as a rule, eight or nine inches in diameter, and contain each three plants. After the potting operation has been completed, and weather favourable, the pots are placed in the open on a hard bottom of cinders, and left there till the advancing buds invite removal under cover, where the flowers can be protected from the vicissitudes of weather and the burning sun. The chief routine treatment during summer consists in the application of water, staking, tying, insect destruction, and the removal of buds from the stems. Some growers leave only one bud on each plant, thus securing only three blooms to each pot; but this frequently tends to coarseness and to burst calyces, and I believe the tendency among cultivators at present is to allow three blooms to each plant. It is the practice, too, with some growers to slip a gutta-percha ring halfway down the still unopened bud, or to tie a strand of raffia round it, and as the bloom expands, the calyx is split and turned back to the tie, and the petals in like manner carefully manipulated, so that a much larger bloom than Nature unaided could furnish is secured. "Run" and badly placed or superabundant petals are removed, and by this simple method of dressing the cultivator sees, developing under his eye, blooms with few or any of the disqualifying marks that annoy. If, however, the blooms are intended for competition, a different kind of dressing must be employed. As already noted, the petal is the unit. It ought to be flat, or the outer edge alone somewhat turned up, and the tyro will be surprised to find how many varieties, otherwise beautiful, do not conform to this simple test. The markings, whether a flake or a bizarre Carnation, a white ground or a yellow ground Picotee, must conform as nearly as possible to requirements. Purity of ground-colour is essential, and a self-coloured petal, or a bizarre with flakes must be removed, as well as all misshapen, curled, or narrow petals, and as far as possible those



MR. MARTIN SMITH'S TWENTY-FOUR FANCY CARNATIONS, EXHIBITED AT THE NATIONAL CARNATION SHOW, 1902

*(By courtesy of Messrs. Cassell)*

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alone left that are perfect in the section to which they belong. Once this has been effected the petals fall to be arranged so as to produce a "bloom." The calyx if it has not been already split halfway down must now be manipulated, at the same time, with a pair of tweezers, folding the split parts back. A large circular card is then provided, and the stem of the flower thrust through a hole sufficiently large not to press in the calyx, and under this a smaller card having three half-inch cuts through its centre is pressed tightly underneath it, the cut portions fitting tightly and holding it in position. The operator, then, with a pair of ivory tweezers arranges the outer row of petals on the upper card, being careful, however, not to overdo size, a second row follows, and so on till the centre is reached, three or four neatly arranged petals finishing off the bloom. "Dressing" is difficult, but any one bearing in mind that every petal of which the flower is composed should be so arranged as to expose its particular beauties, the bloom, as a whole, being a composition of neatly arranged petals, every one as perfect as possible, he will be certain to improve the bloom. Much care is, however, needed in handling the petals not to rub or in any way to damage them. Equally difficult with the dressing of the flower is its arrangement in the show-board. To the experienced it is simplicity itself to distribute the blooms effectively, yet perhaps in no instance does the beginner place his blooms before the judges to the best advantage. It occurs with all kinds of flowers, and at the beginning of his career as an exhibitor, instead of trusting to his own judgment, he ought to secure the services of some one experienced in staging to set up his blooms. The rule that long experience has proved best is to arrange the largest blooms in the backmost, and the smallest in the front row, the very finest specimens always at the left-hand side of the board. Invariably name the blooms.

The practice of showing Carnations in vases is now becoming general, and the need of tact and judgment is just as essential with these as in the case of single blooms shown on boards. It is a rule that dressing must not be conspicuously apparent or, indeed, apparent at all; but the fact remains that the exhibitor who prepares his blooms, other things being equal, is the one who will secure the prize. Without the aid of cards it is possible to add somewhat to the dimensions of any Carnation by a careful arrangement of the petals, and its beauty as a flower is invariably enhanced by the removal of imperfect petals. A most important point is a selection of varieties suitable for exhibiting in this way. Those only that stand boldly up should be chosen, and those that droop rigidly excluded. Sometimes, too, foliage is overdone. Anything that detracts the attention of the judges from the flowers is to be deprecated, and superabundant foliage undoubtedly has that effect. A little is indeed useful in helping to preserve blooms in an upright position, but beyond a little the exhibitor should not go. It is generally impossible to secure several blooms of a sort of equally good quality, but much may be effected in staging to show up the better blooms. Before closing this portion of the subject it may be said that directly a bloom is cut the stem should be placed in water, and left so for an hour or two before it is subjected to manipulation.

The undernoted selection of varieties in the several sections will be of use to the beginner in exhibiting, who will do well to rather cultivate a number of plants of reliable sorts than to grow a greater number composed largely of second-class flowers.



CARNATION — HORSA

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## SELECTION OF SHOW CARNATIONS AND PICOTEEES

**BIZARRES.**—Scarlet : R. Houlgrave, Admiral Curzon, Robert Lord, George. Crimson : Master Fred, J. S. Hedderly, Lord Salisbury, J. D. Hextall. Pink and Purple : William Skirving, Sarah Payne, Edith Annie, Arline.

**FLAKES.**—Scarlet : John Wormald, Sportsman, Guardsman, Miss C. Graham. Rose : Merton, Thalia, Rob Roy, Mrs. Rowan. Purple : Gordon Lewis, G. Melville, Martin Rowan, C. Henwood.

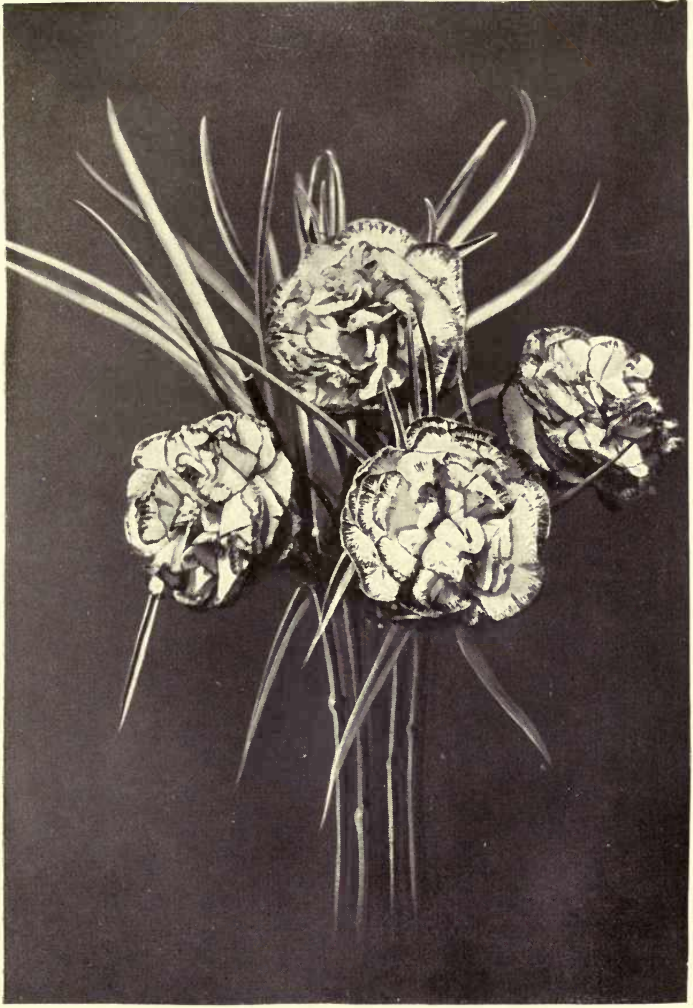
**WHITE-GROUND PICOTEEES.**—Red edge : Ganymede, Brunette, Isabel Lakin, Thomas William, Mrs. Gorton, Grace Darling. Purple edge : Muriel, Mrs. Openshaw, Amy Robsart, Somerhill, Lavinia, Pride of Leyton. Rose and scarlet edge : Mrs. Payne, Little Phil, Mrs. Beswick, Lady Louise, N. H. Johnston, Liddington's Favourite, Fortrose, Clio, Nellie.

**YELLOW-GROUND PICOTEEES.**—Childe Harold, Gertrude, Abbot, Alcinous, Countess of Strathmore, Gronow, Countess of Verulam, Kate Coventry, St. Just, Lady St. Oswald, Rabelais. (For Fancies and Selfs, *v.* Chapter IV.)

## V

### “MALMAISONS”

THE popularity of what are now termed Malmaisons, and more especially of the queen of the section, the pink-coloured *Souvenir de la Malmaison*, sometimes called *Princess of Wales* and also *Lord Rothschild*, is little short of marvellous. This is the more striking because the *Malmaison* is admittedly one of the most difficult of plants to cultivate successfully during a series of years, its erratic behaviour proving a source of the greatest worry to gardeners and of distress to garden-owners. It is an admitted fact, too, that numbers of efficient gardeners literally fail with the plants, and it has been remarked that the cultivator who thoroughly understands the ways of the *Malmaison* is yet to appear. Those who are unacquainted with the flower will naturally want to know why a section that brings so much trouble to the cultivator, and about which there constantly remains a kind of uncertainty as to what it may do next, should still continue the object of solicitude and care. The reason is that the three varieties of the true *Souvenir de la Malmaison* surpass all other Carnations, not alone in the size, but also in the superbly fascinating form of the flower. Joined to that no variety is quite so strongly fragrant of the delightful clove perfume. The colour of the pink form, moreover, and particularly when it assumes its deepest rose tint, is unsurpassed in its loveliness. Nothing is more remarkable in connection



PICOTEE—LADY SOPHIE





with present day gardening than the fact of one, two, three, and more structures in private gardens being devoted solely to the cultivation of this one plant, sometimes solely to the one variety—the Pink Malmaison.

There long remained the utmost uncertainty accompanied by the vaguest guesses as to where and when the original *Souvenir de la Malmaison* with its blush-coloured flower originated. It is now clear that it is not nearly so old a plant as some have conceived, it having been raised from seed by M. Laine, a Frenchman, in 1857. Mr. David Thomson cultivated the plant at Archerfield in 1864, having received the stock from Mr. William Young of Edinburgh. I have been at some trouble trying to secure trustworthy evidence as to the time when and the place where each of the sports originated, and I think I may safely aver that “Lady Middleton” appeared at Luffness in East Lothian in the year 1870, and the Pink Malmaison a few years later (1875) in a garden near Musselburgh. It is a curious trait in connection with this trio derived from a common stock that the last-named is accounted the easiest to cultivate and Lady Middleton the most capricious.

Of late years a large number of new Malmaisons, the result of successful cross-fertilization, has been produced, at first by Mr. Martin R. Smith, who latterly has been joined by others, by whom the varieties have been greatly improved. The earliest attempt at increasing varieties appears to have been made in Belgium, but the flowers were of no great beauty, though in Madame Arthur Warocqué, a scarlet form, there was a decided advance. But it appears that the increase of new varieties of Malmaisons has received a great impetus on the Continent during the past few years, where, as well as in England, there is now a large number of varieties in cultivation.

It will, perhaps, appear strange to growers of the

present day to be told that Malmaisons at first were propagated solely from cuttings, that the young plants were pinched to induce a bushy growth, and that specimen plants were produced without permitting the production of flowers until they had attained the proportions desired. I remember the first plant of Malmaison of my acquaintance was a large specimen in full flower, with the shoots and flower-stems tied to a globe-shaped wire frame! The plant is of course really a tree carnation, and there was less difficulty in training it to that form than at first sight might appear. By degrees the practice of layering superseded propagation by means of cuttings, though the older race of cultivators retained the belief that plants were less healthy produced in that way.

Malmaisons from layers are treated somewhat differently from other carnations. The general practice is to set apart frame-space sufficient to hold the number of plants to be manipulated. The plants are then turned out of their pots, the ball sunk into the soil, and the shoots pegged into some material that will produce roots rapidly. Shortly after the emission of roots, the layer is severed from the parent plant, permitted to make a nice ball of roots, and then transferred singly to flower-pots of four or five inches diameter. My own practice during the past few years varies somewhat from the above method. Acting on the well-recognized principle that any check to a Malmaison is by any means to be avoided or at least minimized, I have layered the shoots into three-inch pots, in this way securing the young plants against any check at this stage. There is a little more labour involved in carrying out this method, but the results, I think, amply compensate. Another system that appears to me worth adopting in the north, where growers are seriously handicapped in getting layers down sufficiently early in the year, is that long customary among cultivators of ordinary Carnations in pots, who root the

layers in the latter. By this means Malmaison shoots can be layered some weeks before the plants are in flower, and be rooted and potted off before it is possible to have them even layered by the present system. It is quite possible, of course, to layer shoots at any season of the year, but what is referred to at present is the mass of summer flowering plants from which the succeeding year's stock must necessarily be produced. (For Propagation, *v.* Chapter X.)

It will, perhaps, be most convenient to make the stage when the layer is ready to be potted up, the starting-point from which to detail the necessary cultural remarks. First, as to soil. Experience proves that the Malmaison is not at all exacting as to soil. At the same time, a fibrous loam, particularly a loam that is naturally friable when the fibrous portion has decayed, is best suited to its requirements. The compost must by all means be what gardeners term open, and sand, to render it so beyond suspicion, must be added when necessary. A portion of really good peat is in some cases advantageous, and some growers like leaf-mould, a material I have generally eschewed. As to manure, I cannot advise its employment. If, however, considered essential, I would use either dry cow-dung, rubbed down to a very fine condition, or manure that had lain so long as to become rotted almost to a mould, also rubbed down or passed through a quarter-inch sieve. In selecting pots, it should be remembered that the Malmaison succeeds most satisfactorily when not straitened for room at root. True, it is possible to produce nice stuff in pots comparatively small, but if those of respectively five, six, and seven inches diameter are selected, it is found that the strongest plants in the end are those in the largest size. In potting up layers, four- or five-inch pots are suitable, which ought to be drained efficiently by means of very finely broken potsherds. Compress the soil moderately firmly, and be

watchful that little of the stem of the plant is buried. During the autumn months it is customary to let potted layers stand in the open, but it is an expedient of doubtful benefit, and, as a rule, the plants ought to be cultivated entirely under glass protection, though affording the plants at all times abundance of fresh air. Very careful watering is essential, because the object is to induce a firm, consolidated growth that will render the plants immune to disease. If previous to, or by the beginning of, October it is observed that the plants are becoming root-bound, they ought to be transferred to larger pots—those in four-inch to six-inch, and those in five-inch to seven-inch ones. In this instance compress the soil very firmly, and maintain caution in the application of water, till in November, December, and part of January, if the condition of thorough coolness with dryness can be secured, the plants will be better kept dry at root. Growth will recommence at the period last named; but up till the beginning of April great carefulness in watering must be observed. Late layers wintered in small pots will require repotting early in February, and in the same month plants to produce bloom during the next winter and spring should be selected and potted in nine-inch pots, employing a rough compost, and ramming it hard in. By April the treatment of all these plants will be identical; water will be required in greater abundance, with the occasional addition of some manurial agent—soot, pigeon-manure, cow-dung, and various chemical agents being employed to stimulate the plants. While the stems are “spindling” until the flowers are expanded, the winter treatment, as regards water, must be reversed, and the plants at this stage on no account permitted to become dry at root, or the atmosphere parched. It is essential, too, to break the direct rays of the sun off the foliage from the end of March onwards, increasing the density of the shade when the buds have become sufficiently

large for the colour to be affected, flowers of deep colour being impossible unless the shade is thick enough to intercept every ray of sun. The cultivator has to make up his mind early in the year whether the stem shall carry one bloom only, or perhaps four or five, which will be found an ample crop, and, acting on this determination, reduce the buds to any of these numbers directly they are large enough to manipulate. Large blooms five and a half to six and a half inches across, borne on long stems, are most often secured by the “one plant, one bloom” system. It is also beneficial to reduce the young shoots to five or six on each plant, though, in the case of plants being grown to produce bloom in winter and spring, no shoots, unless those that are weakly, should be removed. Moreover, the latter ought to have stakes inserted just inside the pots, one for each shoot to be tied to. If there is no other affection or affliction, there will certainly be aphid, unless unremitting attention is bestowed in preventing its appearance. This and other matters of a kindred nature is treated of in Chapter XI.

We shall now follow the fortunes of those plants that were potted into nine-inch pots, the young shoots of which have been tied to stakes, and which, after being cleaned and the old flower-stems removed, require the attention of the cultivator to induce the production of bloom during the off-season. If properly managed, the more forward of these will produce flowering-stems during autumn, but the larger proportion in spring. Up till October the whole should be stood in a structure where abundance of air circulates about the plants. From September shading should be discontinued, while as regards the application of water the soil must be preserved in a healthily moist condition, but never either quite dry or, on the other hand, saturated. From November till March those in a

quiescent condition will require very little water at root, but those it is intended to flower must be placed in a light structure in a temperature of fifty to fifty-five degrees, and watered as required. The flowers produced during this period are not, as a rule, so expansive as summer blooms, but they are generally deeper in colour, and are never unwelcome. Mostly, too, the plants should be thrown away after this forcing treatment. Not infrequently, however, the growths which break freely from the stems of these strike root with little loss if inserted as cuttings in sandy soil, and kept in a warm temperature till the emission of roots. The less forward plants of the batch under review, kept perfectly cool during winter and spring, produce a succession to the forced flowers by merely subjecting them to greenhouse treatment. Large specimens of Malmaisons are rapidly produced by re-potting plants as required, preserving them meanwhile insect free, and all withered or diseased foliage removed. Some cultivators prefer old plants to those that are younger, but the general apprehension is that yearling and two-year-old plants are at once the easiest to control and to manage, while from these the very choicest blooms are secured.

The true *Souvenir de la Malmaison* succeeds well planted in borders of prepared soil, and if a plant has space to grow it will increase to the size of a bush, and produce abundance of blooms. I have repeatedly cultivated young plants in this manner, but destroying them once the crop of flowers was gathered. In 1903, I had a very fine lot of bloom on single stems, that is, one flower to each plant. The best method to secure bloom of this kind is to plant out healthy young stuff either in autumn or spring, in friable soil, in a light, thoroughly ventilated pit. The plants need not be more than seven and a half inches apart each way, but under this system it is indispensable that not one growth more than the flowering-stem is permitted

to push, and every bud, with the exception of the centre one, removed as it appears. The plants require no attention during winter, but when in growth a fair supply of water applied to the soil is essential, sticks for support must be supplied, and attention to aphid attack and disbudding, as already noted, comprises the treatment.

To condense in a few words the essentials of Malmaison culture. Be careful at all times against subjecting the plants to a check, no matter how slight. Over-watering in winter, and, equally, insufficient water in summer, neglect to protect the foliage from sun; aphid, or any other parasitic attack left unattended to for even a short time, each and all having a more or less enervating influence on the plant, the results of which no one can estimate or foresee. Every means too must be taken to build up a hard, firm growth to pass through the winter free from infection or disease, and never on any account should stock be propagated from a plant that is known to be diseased or infected by eelworm. Change of stock it may be said is helpful in securing vigour, as it is in the case of other Carnations.

Malmaisons and also Carnations or various sections are successfully cultivated in glass structures, varying in many essential points, but the best type of house is undoubtedly a span-roof, fifteen to eighteen feet across, with six-foot sides, and fitted with ventilating appliances that will admit an abundance of fresh air at any season. Piping sufficient to dry up damp and to exclude frost is also necessary. The inside arrangements should include a broad central stage and a side one extending all round the structure, and also a roomy pathway. There are several methods of shading, the worst, that of obscuring the glass permanently with some liquid composition. Tiffany is often employed, but the best system is one of lath-rollers that while intercepting the sun's rays at the

same time admits a large percentage of light. It is, however, rather expensive to inaugurate.

Appended are the names of a few varieties of Malmaisons, which, on the authority of Mr. J. H. Cutbush, Barnet, intending cultivators may be assured are the cream of the section. The three original forms of Souvenir de la Malmaison must, of course, be included. Baldwin, dark pink, large; King Oscar, crimson; Lord Welby; Mercia, salmon; Mrs. Martin Smith, rosy-pink, enormous blooms; Mrs. Torrens, large salmon-pink; Mrs. Trelawney, dark salmon; Thora, fine white; Sault, light; Lady Ulrica, deep rose. In addition note may be made of the Queen, which approaches the apricot tint of Mrs. R. Hole, and Duchess of Westminster, an early flowering kind, of great beauty, with true Malmaison foliage, and which may prove exceedingly useful for winter flowering.



## VI

### TREE CARNATIONS

THE so-called Tree Carnation can be traced back beyond a hundred years, but it does not appear that it underwent improvement until the year 1840, when a French gardener, named Dalmais, raised new varieties; and once a break was made, by 1846 many sorts were catalogued. These, however, appear to have been tall-growing plants of straggly habit, and therefore of no great value; but about 1850, M. Alagetiere, another Frenchman, originated a strain possessed of stiffer stems, which proved a vast improvement. Dwarf forms among these are the progenitors of the splendid varieties that are every year being increased, not only in England, but also in other countries, though it would appear that the United States and Great Britain are in these to have a fight for supremacy. The long stems, one of the chief characteristics of American sorts, are being added by English raisers to the finer formed flowers of this country. Small flowers are being eliminated; and latterly, by judicious intercrossing with the larger self Carnations, the long desiderated question of size has been fairly met.

Tree, or, as they are being more generally called, Perpetual Carnations, are quite hardy, and during the summer months the plants may safely be grown in the open air, as is the practice on the Continent and America. In Great Britain, or at least the less favoured portions as to climate, it is, however, perhaps best to cultivate the plants

wholly under glass. Under the protection of a thoroughly ventilated pit, the shoots, while they do not become etiolated, are without a doubt kept free from such diseases as spot and rust, the only drawback being the repeated assaults of green fly, which must be determinedly met and repulsed. Another reason why Tree Carnations are best grown wholly in glass structures is the very important one that the plants bloom with more regularity during winter than those not so favoured, and which sometimes fail to bloom until the winter and early spring has passed away. Named varieties are almost wholly propagated during the three first months of the year by means of cuttings, later than which the plants have too little time to grow into a serviceable size. Under favourable conditions the cuttings produce roots with much facility and with few losses, the most important factor governing the success of the operation undoubtedly being the condition of the cuttings themselves; those, the shoots of plants grown in too high a temperature and insufficiently ventilated, or any infected by eelworm or rust being almost certain to fail. On the other hand, shoots from plants grown in light airy positions, and in a temperature of about fifty-five degrees, possess the conditions that render rapid root emission certain. The cuttings ought not to be large, as a fact rather small cuttings are most generally satisfactory. Dibbled thickly close to the inside rim of four- or five-inch pots in a compost of equal parts loam, fine peat, and sand, the pots plunged in a mild bottom-heat, with an atmospheric temperature not exceeding sixty-five degrees, roots ought to be freely emitted in three weeks, after which bottom-heat becomes prejudicial, and the pots should therefore be placed near the glass for a little time till a small tuft of roots has been formed. At this stage the young plants must be transplanted, either singly into small pots, or they may be "boxed off," that is, a number planted out

into ordinary wooden cutting-trays, in which they sooner gain strength than in pots. Where no efficient means of producing bottom-heat exists, an ordinary dung-heated frame may be employed, but the utmost caution must be exercised not to overdo the heat, nor ever to saturate the cuttings in the steam that is seldom absent from the confined dimensions of this type of propagating structure. Cuttings root readily also if inserted in a shallow layer of sandy compost placed in a cutting-box or tray, fitted with a pane of glass as a cover, and placed above the heating-apparatus of any forcing-house in operation. Where any of these methods is impossible, the Continental practice of striking cuttings or layering in late summer, will be found an efficient means of producing stock. By the latter method the young plants ought to be ready to place in three-inch pots in September, those that require stopping having the growing point extracted at as early a moment as convenient. The young plants winter well with Malmaisons and other sections, treating them in the same manner till the warmer weather of returning spring induces growth, when they will require transplanting into larger pots and shortly be in a condition to be grown in the same manner as spring-rooted plants. Reverting to these, as soon as possible after recovering from the effects of propagation and transplanting, a course of greenhouse treatment must be substituted for that of the hothouse, and by April the young plants will thrive best in a pit, where fresh air always plays about them. Much the same system as regards repotting and general treatment should be pursued as in the case of other soft-wooded greenhouse plants, that is, they ought to be repotted previous to the plants being possibly checked in growth, the shoots must be stopped once or twice in order to induce a bushy habit; but stopping cannot be pursued beyond May or June without endangering the winter's bloom. Nice blooming plants, with five to

eight flowering-stems each, are produced in pots six inches in diameter; but extra strong plants afforded a further shift into eight-inch pots produces a more than relative amount of bloom. Ordinary turfy loam, lightened with the addition of leaf-mould, a small proportion of sifted cow-dung, and sand to render the compost open beyond question, forms a suitable rooting medium. It is a mistake to try to force plants into bloom. The proper method is to time the plants so that buds are well forward previous to the advent of winter, when a slight accession of heat will bring them on without enervating the plants, finally leaving them diseased and worthless.

The number of varieties in cultivation is quite perplexing, especially if one grows Continental forms, some of which are quite lovely, though it must be confessed the flowers as a rule are rough and unkempt, as are American sorts when compared with English varieties. Still it is apparent that the Americans are more and more attracting the attention of cultivators, and in a select dozen such as the undernoted they cannot be overlooked. A first-rate twelve will include America, one of the best sorts at present to be had. It is of strong growth, with cerise flowers; Duchess of Portland; La Villette, yellow ground with crimson stripes, and a sweet perfume; Melba, fine pink, with long stiff stems, blooms very fragrant; Mrs. Leopold Rothschild (Madame Therese Franco), a very free and lovely variety; Mrs. Lawson (Mrs. Thomas W. Lawson), the long-stemmed, deep pink American variety that is now grown everywhere; Mrs. S. J. Brooks, a strong clove-scented pure white form; Mr. Edward Smith; Prosperity, one of the finest, rosy; Royalty, very fine, with long stems; Winter Beauty, said to be an improved Winter Cheer, which, however, cannot be left out. In addition, Yule Tide, Deutche Brant, General Gomez, Uriah Pike, and William Robinson, are sorts that may well be grown too.

## ANNUAL PINKS

*Dianthus chinensis*, the Indian or China Pink, introduced in 1713, is now treated as an annual, though an earlier race of horticulturists cultivated it as a biennial, and sowed the seeds in June and transplanted the seedlings when fit to handle into prepared beds, while to strengthen the young plants still further flower-stems that pushed the same year were rigorously suppressed. Cultivated in that way very large plants that flowered in much profusion were produced. Latterly, however, the Indian Pink, in all its numerous varieties, has been grown as an annual. The period during which the seeds may be sown with every certainty of the plants flowering the same year extends from February, in which month it is the general practice to raise plants under glass, until the beginning of April, when the seeds are sown in the ground where the plants are to flower. This species succeeds best when given a fairly fertile soil, the addition of some year-old manure, well-rotted, effecting a vigorous and floriferous growth.

The varieties at present in cultivation are very numerous, there being many subsections, in each of which a wide range of colours exists. The most remarkable step in advance occurred about the year 1860, when the Japanese variety, *D. Heddeewigi*, was introduced from St. Peterburgh, a Mr. Heddeewig of that city having obtained seeds from Japan a few years previously. The flowers are very large, with a range of colour embracing white to darkest crimson in both single and double forms. In addition to what may be termed the type there is another called *D. H. laciniatus*, the flowers of which possess deeply fringed petals, some very charming colours having been produced of late years in this section. Yet another break in which the petals are edged with white is that called *D. H. diadematus*, so that in the

Heddewigi section alone there are many dozens of single and double varieties of which it may be said with truth that all possess qualities rendering them worthy cultivation.

Of what may be termed the ordinary Indian Pink there exists several subsections, each containing many varieties both single and double, but none so showy as the Heddewigi class. The double forms, especially the white, are, however, of distinct value, and a clustered double called *D. c. plenissimus* is a very desirable form. *D. c. nanus* comprises a large number of varieties that do not exceed six inches in height, and in *D. c. diadematus* we have a counterpart of the cut-leaved *D. Heddewigi diadematus*, but much smaller in all its parts.

A most distinct large flowering form is that called *D. c. imperialis*, but this belongs to the hybrid section, being the result of a supposed cross between *D. chinensis* and a Sweet William. The Indian Pink is indeed remarkable for the beautiful hybrids that have resulted from crosses with other species, the very first recorded hybrid, Fairchild's Sweet William, which Bradley termed a mule and now always called a Mule Pink, having appeared about 1715-16, the other parent having been a Sweet William. It is also a parent of the gloriously brilliant *D. Atkinsoni*, as well as of others, references to which will be found in the chapter in which hybrids are discussed. All the Indian Pinks are of much value in the flower garden, employed either in massing or as floral carpets to plants of a stately growth. They form thick masses of foliage and flowers, and continue in bloom until stopped by frost. A selection is also suitable for providing material for cutting, the double white, Salmon Queen, Eastern Queen, and the Heddewigi section generally being invaluable in autumn. For this purpose the plants should be set in beds allowing each a space of about fifteen inches, and there every freedom may be

used in cutting without risk of spoiling flower-beds. As well as for furnishing vases the flowers with buds are charming in bouquets or rough posies.

“MARGARET” OR “MARGUERITES”

These are a sweetly scented strain with flowers mostly double, the petals of which are deeply crenated. Seeds sown in spring under glass protection and grown on without check produce nice plants that flower the same autumn, and continue well into winter, providing a succession of sweet flowers. They have indeed been found to flower under favourable conditions six months in succession. It is a not uncommon practice to plant out the seedlings in May, lifting and repotting them in October, a method that while it saves much labour during summer at the same time suits the plants.

## VII

### HISTORY OF THE PINK

THAT it would be rash to conclude the word "Pink," as applied to a flower, is derived from a colour is clear from the fact that no authority has ever assumed this to be the case. Dr. Prior thought it to be a derivative from "Pinksten" (Pentecost), meaning fifty days after, from the season one species flowers. Older authorities have traced the word to a Dutch source, "an eye," and when an eye is mentioned by old writers, it must be understood the very centre of the flower is not always referred to, but rather a ring of another colour encircling the central spot. Pink has yet other meanings, one of which Parkinson has in his mind in describing a "Nectorin with a pincking blossome," the petals in this sort being mere strips, such as one sees in the deeply incised petals of *Dianthus plumarius*, and even more pronouncedly in those of *D. superbus*, so that, without having recourse to the rather far-fetched theory of Dr. Prior, one may choose either of the other meanings—a word indicative of a colour circle near the centre of the flower, or one descriptive of deeply fringed petals. One thing is absolutely without doubt, that up to the end of the sixteenth century the Pink was invariably a single flower, the larger single Carnations, for instance, on account of not being double, coming under that designation. In Tusser's list of flowers, first published in 1573, "Pinks of all sorts" occur, and in Lyte's "Niewe Herball" of 1578, a fairly lucid





*Photo by*

WILD CARNATIONS AND PINKS

*D. T. Fish*



description of garden Pinks is given, the figure accompanying the text being a cut of *Dianthus superbus*. "The Pynkes and small feathered Gillofers are like to the double or cloave Gillofers in leaves, stalkes, and floures, saving they be single and a great deale smaller. The leaves be long and narrow, almost like grasse, the smal stemmes are slender and knottie, upon which growe the sweete smelling floures, like to the Gillofers aforesayde, saving eache floure is single with five or sixe small leaves, deepe and finely snipt, or frenged like to small feathers of white, redde, and carnation colour." Elsewhere, Lyte remarks there were "divers sortes great and small," and as diverse in colours as Carnations, adding they were "called in Englishe by divers names, as Pynkes, Soppes in Wine, feathered Gillofers and small Honesties." Gerard is the earliest authority to introduce us to double Pinks, obviously forms of *D. plumarius*, of which when Parkinson wrote there were two or three. If we are to credit Rea, Pinks were of little esteem, and were grown in gardens mostly as edgings to flower-beds, and sometimes used in posies along with damask roses. Writers on gardening in the early part of the eighteenth century, include Pinks among other flowers esteemed in gardens. It is at this period the Pheasant-eyed Pink first appears. A "gardener," writing in 1732, notes the Pink as "a very sweet and fine Flower, having a great many Varieties, some single, mark'd finely with Red in the Middle, call'd *Pheasant-ey'd* Pink, one sort as large as a Carnation, and double, with the *Pheasant-eye* in the Middle." The same authority mentions "a striped Sort, call'd the Old Man's-head Pink, which blows all the Winter, if it be shelter'd in a Green-house." Miller adds other names to those noted above, and other writers add to the varieties, showing how much this sweet flower was esteemed in the early Georgian era. Among the varieties named by Miller, is one called Dobson's, which shortly after

we find superseded by a New Dobson's, commended as the prettiest of the whole tribe, and a sort to use for raising new kinds. The colouring of this variety was distinct from all others, the centre being deep chocolate with an edging of white, the nearest approach of any known old variety to what are called the Black and White Pinks. A break from these, not impossibly from the New Dobson's, occurred about 1770, when James Major, gardener to the Duchess of Lancaster, secured a seedling with markings to the edgings of the petals of the same colour as the centre. This was named after his mistress, and so highly was it esteemed, that plants of it were sold to the value of £80. Seed saved from the Duchess produced Lady Stoverdale, long considered a very fine form of what is termed the Laced Pink, the present-day type of the Pink of the florist. The muslin weavers of Paisley, in Renfrewshire, as a class, were greatly devoted to floriculture, and one or more of their number, about 1785, having secured seeds of Pinks from London, the plants from which produced among others some Laced Pinks, the culture of this flower was entered on with such enthusiasm, and attended with so great success, that varieties were shortly distributed over the country equal and even superior to others. These were known as Scotch Pinks, and though that name has somehow become attached to "Black and White" varieties, or those without a lacing, it is clear that the weavers themselves considered their laced productions the more meritorious. During the first half of last century, the cultivation of Pinks had undoubtedly reached its greatest perfection, since when they have gradually declined in favour, and it is doubtful if the delightful Black and White section, also called Plain Pinks, is now even in existence. Laced Pinks were divided into three sections, being according to the depth of colour in the markings called dark-laced or red-laced. The

markings on these were on a white ground, but there was another section called Rose Pinks, in which the ground colour was rose, with the petals marked and laced with a darker shade. Of the last-named section is Anne Boleyn, a variety raised about seventy years ago, and figured in *The Florist's Magazine*, 1835-36. It is still cultivated alike for its beauty as a flower and for its pleasant perfume.

About 1850, "Lord Lyons," the forerunner of what has proved a most useful section, called Border, and also Forcing Pinks was secured by a gardener of Bury St. Edmunds, named James Clarke, the parents being a seedling derived from a Laced Pink and Anne Boleyn.<sup>1</sup> Lord Lyons has not yet been surpassed in its colour, purple, but the range of colours has been greatly extended, latterly, sorts with picotee edges having been produced. Even more popular and more useful than these are the White Cutting Pinks, the first of which was Mrs. Sinkins, derived from a cross between a Clove Carnation and a Pink, and than these no Pinks are so largely cultivated at the present time.

Before concluding this chapter, it may be remarked that Loudon, as well as some other early authorities, considered the Pink not solely an improved cultural form or *Dianthus plumarius*, as is, perhaps, too rashly assumed in these days, but that *D. deltoides* and varieties of the Carnation at one time or other contributed to its production. A careful examination of the case leaves one satisfied that Loudon's conception is largely consistent with fact. Carnations, undoubtedly, as in the case of some present-day varieties, have played a part in their production, the Old Man's-head, for instance, by several old writers having been assumed to be more closely allied to a Carnation than to a Pink, and I think it not unlikely that the Rose laced forms, of which Anne Boleyn alone remains to us, were partly derived from that sort. Nor is it unlikely that *D. superbus* is unrepresented.

## CULTIVATION OF THE PINK

In treating of the cultivation of the Pink, it will be convenient to divide it into sections, the first of which shall be devoted to the florist's type.

I have been unable to gain any information as to Plain or Black and White Pinks being still in existence. To many who know these it must be a matter of much regret that a flower so attractively marked and withal so sweet should have been permitted to become a castaway. The plants conformed to the treatment that suited Laced Pinks, and if grown for exhibition, it was usual to be very particular in protecting the blooms from weather of all sorts, and this, generally, by means of glass blurred. Named varieties of these, and of Laced Pinks, were wont to be propagated almost solely by means of "pipings," which a past generation considered gave the best results, the month of June being the most suitable time to propagate these. They are also increased by means of ordinary cuttings, and occasionally by layers (*v.* Chapter X.). As the Pink makes its annual growth earlier than the Carnation, so it can be propagated correspondingly sooner, and in order to gain strong plants, early propagation becomes a point of some importance. The plant, being absolutely hardy and less affected by the vicissitudes of winter than the Carnation, is invariably planted where it is to flower, the month of September, from a long experience confirmed by all cultivators, being eminently suitable. Plants not transplanted till later or left till spring do not produce the marking called the "lacing" in such perfection as do those set at the earliest possible moment. Nay, so fastidious is the Pink as to this matter, that those spring-planted very frequently refuse to furnish a lacing at all! Though the Pink will thrive in any ordinarily fertile soil, it prefers that which has been thoroughly cultivated and pulverized, and with which a

two- or three-inch dressing of decayed manure has been incorporated, applying a portion of the less rough to the layer of soil in juxtaposition with the roots. To strengthen newly rooted plants previous to setting in beds it is the practice to establish them first in nursery beds. Where these can be composed solely of fresh material it will be found of much advantage. Loam one part, with leaf-mould and finely triturated cow-dung in equal proportion forming the other part, makes an ideal compost. Place this not more than three inches thick on a firm bottom of coal cinders, compressing it meanwhile moderately firmly, and set the young Pinks in this, at four inches apart each way. When ready to transplant, every plant ought to lift with a closely netted ball of roots. A foot apart will be space sufficient for each in the flowering quarters, and in planting care must be taken not to lower the plant into the soil, but rather to have it elevated, but to an almost imperceptible extent, above the surface. If treated as thus advised, beyond stirring the surface of the soil, previous to winter setting in, nothing further will be required till spring, when, on evidence of growth commencing, a slight dressing of sifted pigeon-manure, or, if that is impossible, some other manurial agent should be sprinkled evenly over the surface of the soil. Soot forms a suitable fertilizer too, and may be applied later as an additional stimulant. For exhibition purposes from one to five stems are left on each plant, and these are disbudded in due time, never more than three buds being left to expand. The older florists were particularly careful to tie the calyx of each bloom with a piece of matting in order to preserve it intact, and as it was a cause for disqualification to exhibit a bloom in this condition, it not infrequently occurred that in the excitement of staging a tie was overlooked, and the expectant victor became a disqualified delinquent. Some good exhibition flowers are unfortunately produced by weakly constituted

plants, and, if the Pink is given a place as a garden flower, which it is well fitted to fill, these should be shunned. Mrs. Waite and Victory are sorts that are very free and of vigorous habit, and for this purpose these, it may be said, do not require to be propagated annually. Some of the best exhibition varieties are, Boiard, Mrs. Dark, Modesty, Device, Harry Hooper, Zoë, Empress of India, Godfrey, Minerva, Amy, Reliance, The Rector, and Princess Louise.

What have been termed Garden or Forcing Pinks comprise another section. The oldest, and still one of the best varieties, is Anne Boleyn, which is best propagated by layering. Next in age is Lord Lyons, and in various shades of colouring such as Ascot, Paddington, and Ernest Ladhams may be mentioned. These are increased with facility by cuttings, and a rough-and-ready way of securing large clumps consists in pulling an overgrown plant into good-sized pieces, when, if operated on in September, the pieces will certainly produce roots, and grow. As forcing plants, the practice is to grow them on in the open like violets, and in autumn to lift with balls of soil attached, and to plant in pots five or six inches diameter. The best place to stand the plants at this stage is in a protected position out-of-doors. Lifted in the end of September, or early in October, they are ready to place in a pit early in November, where they come on slowly, and with the aid of just a little heat in January soon produce flowers. What may be called the White Flowered section, including Mrs. Sinkins, Her Majesty, Albino, and Snowflake, is also amenable to forcing treatment as above. Their weak point is the hardy nature of the plants, which resent the amount of heat a too enthusiastic attendant would like to supply them with.

As edging plants to divisions in gardens or by the sides of walks this class of Pinks is invaluable, and for this



purpose the old *fimbriata* and *fimbriata alba* (the White Shock) must not be overlooked. It is advisable, too, that those who are called upon to produce much material for cut flowers should devote space to a selection of these. Mrs. Sinkins and the newer forms being annually produced possess a distinctly perpetual habit, and flower from June to October, so that at any moment we may have in our hands a new plant of incalculable value for garden decoration all through the summer and autumn months. Because established plants flower more profusely than young ones, it would be a mistake to replace beds still floriferous by those filled with yearlings. As a fact, they partake greatly of the nature of perennials, and, as an instance, I have a clump of Her Majesty that is at least ten years old. It must be added that Pinks of all kinds are easy to produce from seeds, the management of the flowers as to seed-production being the same as detailed for Carnations. They do well sown in the open ground, though the protection of a frame will, as a rule, yield more certain results.

## VIII

### MULES OR HYBRIDS

DIANTHUS, as a genus, is remarkable for the facility one species crosses with another, thus producing hybrids or mules. Every hybrid is of course not a mule in the sense of being sterile. If that were so, it would be an impossibility to secure seeds off Pinks, which undoubtedly have had an admixture of more than one species in the various sections, nor can we certainly admit that the Carnations of to-day are the result of breeding from one only species. While the heading of this chapter is "Mules," it therefore must not be understood that all the plants mentioned are necessarily incapable of seed production. Napoleon III., for instance, certainly produces seeds on the Continent, and it is invariably called a Mule Pink. The name dates from the beginning of the eighteenth century, and was the happy inspiration of the botanist Bradley to indicate a new type of plant, the parents of which were stated to be a Carnation and a Sweet William, that was produced in Fairchild's Nursery at Hoxton. It has, however, been shown that pollen of the latter is impotent applied to a Carnation, or in other words, the two do not "cross," and judging from the fact that *Dianthus chinensis*, a species noteworthy for the facility it crosses with other species, had been introduced shortly previous to the appearance of the new hybrid, and that such hybrids were common afterwards, it may, I think, be safely assumed that a mistake had been made, and

the Indian Pink, instead of the Carnation, was one of the parents. At the time this plant appeared as a chance seedling, Bradley was deep in the then novel discovery of plant fertilization, and he at once pounced upon the novelty as a splendid illustration of the correctness of his theories. Otherwise the history, or perhaps any knowledge of the hybrid, might have been lost, as no doubt any crosses that may have been effected in earlier years were. This plant was known for a long time both as Fairchild's Sweet William and the Mule Pink. In *A Monthly Calender*, 1738, "several Varieties" are noted, but the authority is perhaps not reliable; but in the year 1770, a Scottish nurseryman indicates as a companion to Fairchild's mule a fine red double Sweet William, of the former of which, he says, it is a variety. "Of late years there has been a variety obtained from seed with a Sweet William leaf, upon which it has got the name of Sweet William Indian Pink." It reproduced itself freely from seed. Another old plant was reintroduced, about forty years ago, to general cultivation by the late Thomas S. Ware, of Tottenham, by the name of *Dianthus barbatus magnificus*, and became generally known as Ware's Sweet William. This plant has been cultivated in Scotland for a very long period, one of its names being Murray's Sweet William. The plant is sterile, and though the foliage is distinctly of the Sweet William type, the habit is not the same. It grows to a height of six to nine inches, and produces a large number of stems, which form broad heads of deep crimson sweet-scented double flowers. In some soils it is perennial, though at any time it is apt to dry up and die during summer, hence it is advisable to propagate young stock annually. September is the most suitable time to undertake this operation, the base of the leaf growths being then covered with air-roots, and all that is necessary to ensure success is to take up a few plants, pull them in pieces, and dibble or line these into

a bit of newly dug ground, at a few inches apart. As the work proceeds, compress the soil firmly. In spring the then well-rooted plants are in fit condition to lift, and to plant where wanted to bloom. But they may be transplanted at any time, even when in full bloom, without affecting the plants injuriously. This is undoubtedly one of the gems among hardy border plants, and deserves extended cultivation. A recently introduced kind, called Prince of Wales, has close affinities to the above.

The following are mostly of recent introduction, some of which are best propagated by means of layers, though the majority strike root freely from cuttings or side growths slipped off.

*Dianthus Abbotsfordianus* is a double-flowered mule, with rosy-purple flowers. Raised in Scotland.

*D. Alice Lee* is a very pretty double white form, with foliage not unlike a Pink. It is of much value as a low-growing border plant, or for planting in the rockery.

*Dianthus Atkinsoni*.—This is one of the most gloriously beautiful of the Mule Pinks, and is supposed to have been the offspring of *D. chinensis*. It was raised about the year 1845 by Mrs. Atkinson, of Bacton Hall, Norfolk. The flowers are blood-red, one and a half to two and a half inches across, borne on slender stems over a foot high. It has never been known to produce seeds, and flowers so profusely that, like *D. Napoleon III.*, it is difficult to perpetuate, or in many soils to preserve, as after flowering the plant is apt to die. Cuttings strike root freely if inserted among sandy soil in pots in autumn, and kept in a cold frame until rooted. It is, however, not always possible to secure cuttings unless one or more plants have the flowering stems removed as they shoot up, when an abundant crop of young growths will follow, and these must be utilized as cuttings. The plant otherwise is not difficult to cultivate.

*D. compactus*.—A good form; pale rose with crimson.

*D. Courtoisi*.—The result of a cross between *D. barbatus* and *D. superbus*, with brilliant flowers; makes an excellent rock plant, and is a good doer.

*D. Highclere* produces single scarlet-crimson flowers. A good border flower.

*D. imperialis*.—A supposed mule between a Sweet William and *D. chinensis*, is generally treated as an annual, along with Indian Pinks. It is a very fine thing, though it is very variable, and many varieties are in cultivation.

*D. Lady Campbell* is a clear pink colour, and well worth cultivating.

*D. Lady Dixon*.—Said to be a cross between a Sweet William and a Clove Carnation; is a very desirable plant. It was first exhibited in London in 1901, and received an award from the Royal Horticultural Society. The flowers are red-crimson in colour.

*D. Lucy Ireland* is a double crimson variety.

*D. Marie Paré* has been extensively cultivated for many years. The flowers are a pure white, of much beauty, and the plant should find a place in all good gardens.

*D. Crimson Bedder* is a perfectly distinct form, established plants forming cushiony clumps which produce during summer an abundance of dark-coloured double flowers. This variety is eminently suited for an edging plant. It is not known whence it originated, or the parents, but in some respects it approaches *D. deltoides*, and is propagated in the same manner—by division.

*D. dentatus hybridus* is a double-flowered form of no great beauty.

*D. Diana*.—Pale rosy-purple double flowers.

*D. Fettes Mount* is a charming free-flowering variety of a rosy colour, the flowers being most abundantly produced. The foliage is apt to suffer from "spot." It is perhaps best increased by means of layers in July

and these, when well rooted, should be planted out about the middle of September. It was originated by Mr. Potts, who also gave to garden lovers the hybrid *Montbretia Pottsi*.

*D. Grievei*.—Like the above, this also hails from Scotland, having been raised by Mr. James Grieve, and is a hybrid, with a Sweet William and a single Laced Pink as parents. The flowers vary from white to rose, and the foliage is that of a Sweet William.

*D. floribundus* is a bright floriferous variety.

*D. Lindsayi* was raised by Mr. Lindsay, late of the Botanic Garden, Edinburgh, the parents being a Sweet William and *D. alpinus*. It has now become exceedingly scarce.

*D. Miss Bateson*.—Very pale rose.

*D. Michael Foster* is an exceedingly showy double variety, and valuable for border decoration. The plant is free, and easy to cultivate. Assumed *D. alpinus* × *D. superbus*.

*D. moschatus* is a Continental kind, of a distinct shade of rosy-lilac, the flowers being exceedingly fragrant.

*D. multiflorus*.—Of this there are two forms in cultivation—the one scarlet, the other rosy-pink.

*D. Napoleon III*.—This is undoubtedly a gem of the first water. The flowers are dark crimson, not large, but produced most profusely on wiry stems, which are about nine inches in length. The foliage is small and neat. Where a number of plants are grouped together, the effect when in flower is exceedingly brilliant and effective. As a pot plant, too, Napoleon III. is of much value. It is, however, unfortunately a difficult plant to preserve unless special means are taken to continue a supply of young plants, it being so floriferous as to flower itself to death. The same method must be pursued as in the case of *D. Atkinsoni*, namely, to set apart a few plants, preventing these from flowering, when abundance of shoots will be

produced; these strike root freely, treated in the same way as advised in the case of that hybrid. Rust sometimes attacks the tips of the leaves, which it is advisable should be cut off when first observed, in order to prevent infection to others. Otherwise, the plant presents no difficulties in its cultivation.

*D. Quelteri* is another dark-crimson form.

*D. Rose Perpetual* is supposed to be a plumarius hybrid. The plant is valuable in flowering continuously far into autumn.

*D. Rosetta* produces a neat flower of a pinky shade.

*D. Spencer Bickham* resulted, about 1900, from a cross between *D. cæsius* and *D. deltoides*. The flowers are deep rosy-crimson, and the plant growing only five inches in height is well suited to the rockery.

*D. striatiflorus* produces striped flowers, and is a variety that has been in gardens during many years. It is, perhaps, more bizarre than beautiful.

*D. superbus*, though bearing the name of a species, has nothing in common with that plant. This is a dark-crimson double-flowered mule, exceedingly fragrant, and possessed of a perpetual habit, and a plant altogether worthy attention.

*D. superbus garnerianus*.—This has already been noted in the chapter on Species. It is commonly called *D. s. Gardneri*.

## IX

### THE SWEET WILLIAM

COBBETT somewhere made a remark to the effect that a bed of Sweet Williams was the most beautiful thing that one can behold of the flower kind. Though few will subscribe to a like enthusiasm, all lovers of simple flowers find with him a great attraction in even the commonest forms of Sweet William, its delightful perfume alone being all-powerful in gaining admirers. While all the old authorities rightly considered the plant to be nearly related to the Carnation and to the Pink, they by no means confined the name to *Dianthus barbatus*. That exuberantly humorous writer, Bulleyne, for instance, in "The Boke of Simples," defines the Wallflower as a Sweet William, while among Wild Williams are included *Silene muscipula*, *Lychnis Flos-Cuculi*, and *Dianthus prolifer*.

It has never been satisfactorily settled what "William" means—whether the name of a saint, or, as Dr. Prior with some hesitation proposed, a derivative of the French *Œillet*. Unfortunately for the latter view, Sweet William is not found in sixteenth-century French as "*Œillet*," but as "*Armoire*," though, later, *Œillet d'Espagne* appears. Co-existent with this plant is the "John," or "Sweet John," which modern authorities identify as *Dianthus Carthusianorum*, but which all the old gardeners, including the astute Philip Miller, considered only a variety of *D. barbatus*. But Sweet William,



pretty as it is as a name, and appropriate as it is applied to a flower in itself so sweet, is by no means the only appellative belonging to the plant, which was called also Tuft Gilliflower, London Tufts, and the altogether incomprehensible designation, Tolmeniers, each of these representing a self-coloured variety of the Sweet William. One, with spotted flowers, was called London Pride, a name transferred, according to John Ray, the botanist, to *Saxifraga umbrosa*.

The earliest form of double Sweet Williams was double in the sense of possessing two rows of petals to each flower, and of these, if we are to credit Samuel Gilbert, the florist, the double Sweet Johns were alone worthy esteem. The first variety possessed of a distinct eye is noted by Parkinson in 1629, and this was dubbed by Rea, on account of its rich colouring, "The Velvet Sweet William." A peculiar feature of these early forms was the tall habit possessed by the plants. How delightful if we had a few such to-day!

Closely following the advent of the eighteenth century, a remarkable impetus to gardening is observable in all its branches, and, about the year 1715, appeared the first recorded hybrid with a Sweet William as one of the parents, to which the name Fairchild's Sweet William was given, but better known as a Mule Pink. Flowers wholly double were also originated about this period, and were extensively cultivated in gardens, as well as in pots to adorn "chimneys," or fireplaces, and apartments generally. There were also varieties with striped flowers, and the inevitable "Painted Lady," which was a double form, having a dark centre and a white edge to the petals. In MacDonal's "Gardener's Dictionary" (1807) the above and many other kinds are said to be varieties of the "Sweet John," and in the same work a plate of a beautiful auricula-eyed Sweet William, by Sydenham Edwards, is evidence of the advanced condition of the Sweet William

a century ago. The latter were called Variegated Sweet Williams, and as such can be traced well back into the eighteenth century. But the Sweet William has always been so common a flower that writers have taken for granted that nothing novel could be said about it, and consequently we are left very much in the dark concerning its progress. In Scotland it has long been held in great esteem, and fifty years ago or less a number of double varieties were cultivated, all of which are now non-existent, with perhaps the exception of that sort known in England as Ware's Sweet William.

The Sweet William being a biennial, and under some conditions a perennial, seedlings do not flower till the second year. Seeds are sown in the open garden in May or June, and when sufficiently large to transplant are either transferred to the position selected for them to fill, or are bedded in nursery lines till required. The plant appreciates a fertile open soil, in which large heads of flowers are freely produced, remaining in beauty for about three months. If seeds are required they will be found in quantity in the dried seed capsules. In order to perpetuate any particularly fine variety, seeds cannot, however, be relied on, and as of late years some distinct double varieties have been obtained, it may be noted that the basal shoots of the Sweet William produce towards autumn abundance of roots. In dry or warm positions this propensity should be taken advantage of by applying a light covering of soil and leaf-mould, of which the stem roots will shortly take possession, following which let them be separated from the parent and planted where required. In the case of cool soils the above precaution will generally be unnecessary, plenty of adventitious roots appearing without any extraneous aid. It must be noted, too, that the plant, if grown under suitable conditions, exists for many years, becomes a perennial in fact. It possesses, moreover, the happy quality of not



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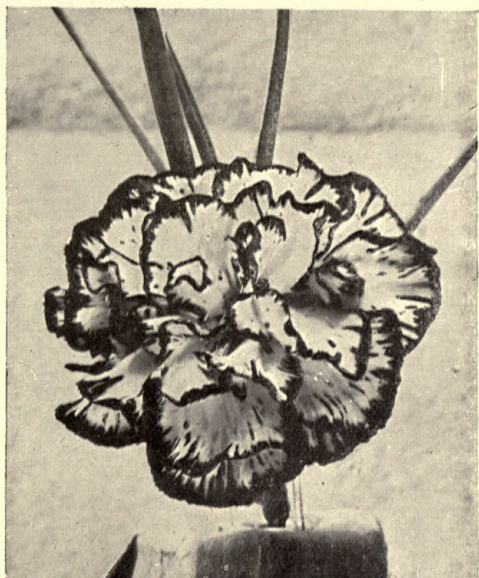
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taking much amiss ; transplantation at any season, even when in full flower, requiring, however, a sufficient supply of water at root till re-established.

### THE CARNATION AS A MARKET FLOWER

A short notice of the place this family occupies as a market plant may be considered necessary. For up-to-date information I appealed to Mr. George Monro, junior, who kindly furnished the following details, which afford a glimpse of the remarkably limited number that are thought worth the market-grower's attention. The colours, it will be seen, are distinct, and of their kind as perfect as may be had, though the form of the flowers are not such as appeal to the florist. During the outdoor season the Carnations chiefly brought to market are Raby Castle, Mrs. Reynolds Hole, Uriah Pike, and Duchess of Fife, of the latter of which I can vouch for its fine quality as offered in the streets of London. A few years ago I passed in Gracechurch Street a street merchant, whose stock-in-trade consisted solely of a large bunch of lovely pink Carnations, which I thought was the Duchess, but to make sure I put to him the question, "What are these?" Business, alas! had dulled his other senses, and his reply, "A penny each, sir!" contributed nothing to its identification. Germania is also produced in great quantities during summer, but are grown in glasshouses. During the London season the pink Souvenir de la Malmaison (Princess of Wales) is very popular. Guernsey used to be a great growing centre for these; but I believe the plants there have become badly affected with disease, and the supply has accordingly diminished to a great extent. The greatest proportion of this variety is said to be sent to London from private gardens, and the best samples are derived from Scottish growers. During winter and spring

the supply is derived chiefly from the neighbourhood of Hampton-on-Thames, the sorts cultivated in greatest quantities being Duchess of Fife, Winter Cheer, "Franco" (Mrs. Leopold Rothschild), White Clove, Mrs. Moore, General Buller, and Germania. American varieties seem to be gaining in the regard of purchasers, and Mrs. T. Lawson is now cultivated largely, while it is clear that Royalty, Prosperity and others will soon be equally so. Of pinks, Her Majesty is the favourite, and Mrs. Sinkins next.



PICOTEE - ARGOSY





## X

### PROPAGATION BY SEED

THE wild flower designated *Dianthus Caryophyllus* is the assumed parent of the long line of Carnations, Picotees, and Clove Gilliflowers, an intense obscurity as already mentioned resting on their early history ; but it is not a little remarkable that all along from the time we have any definite knowledge of them, sorts of the finer section, alike on the Continent and in England, have been cultivated in pots, vases, or tubs, and protected from inclement weather in winter, while alongside these, plants of a hardier—not by any means always a more robust strain—have been left to take care of themselves, exposed in the open garden to every change of the elements. Theoretically, all Carnations are hardy, but it is an incontrovertible fact that a necessity exists, and has always existed, for treating a certain number as not altogether hardy. Yet, as seedlings, all thrive in the open, though once reproduction by other means has been effected a proportion betray a constitution demanding protection and care. The plant under some conditions is by no means short-lived, and I have indeed had seedlings that throve during a number of years, the plants extending meanwhile into large clumps. The most perfectly adapted, as also the most natural method of propagation would accordingly appear to be by means of seeds, which, moreover, possesses other commendable points, being at once the most facile, cheap, and rapid method of creating a stock of plants that in

their turn exhibit a profuse floriferousness immensely ahead of those produced any other way. To the ordinary flower-lover, whose tastes are simple, the diversity in colour and form, and the exquisite single varieties never absent from a batch of seedlings, indicates this as, to him, the most interesting phase of Carnation culture he can pursue. The seeds sold in England are generally the production of German florists, the produce varying very much in quality. High-class seeds are naturally expensive. Even on the Continent it is the practice to cultivate seed-bearing plants in pots, and in this country it is practically impossible to produce seeds under any other conditions. Moreover, fertilization and other processes such as harvesting and cleaning are all effected by hand. Cheap Carnation seeds should therefore be eschewed, for while expensive seeds may prove unsatisfactory, it is certain that cheap ones will be so.

Up till a quite recent period the quality of seedlings was largely a question of chance, the fertilization of flowers being effected entirely by insect agency. Now, however, in all parts of the country enthusiasts carry out the process on lines more or less scientific, and that none may despair of succeeding it is a fact worth noting that some of the more popular and long-standing varieties have resulted from the labour of unknown workers.

The Carnation is bisexual, or possesses in each flower an ovary with styles and stigmatic processes, and fertilizing pollen-bearers or anthers. If the petals of a bloom are carefully removed, there will be found springing from the apex of the ovary or seed-capsule, two, and not unseldom three, styles, which in some varieties are bent, curled, and twisted in a curious manner, those in dark-coloured varieties being generally coloured. When in a condition to receive the pollen the whole surface of the style is erupted, rough in appearance, and covered with a clammy exudation that catches and retains any



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pollen that falls upon its surface. The part the would-be raiser of seedling Carnations has to play is to watch for this condition, and the development of the anthers, ten of which will be found, hidden not infrequently by the petals. When ripe the anther-cases burst and set free the pollen, which in the Carnation is in the form of a fine dust. It attaches itself to anything by which it is touched, a fine camel-hair pencil being usually employed to convey it from the anthers to the styles of the flower selected to bear seed. But the filaments carrying their anthers may be wholly removed and the pollen distributed without employing any intermediary agent. The pollen, it may be added, retains its potency for some time after removal, and may be preserved dry to apply to the flowers of any variety not yet expanded when the pollen selected for cross-fertilization is ready. Some varieties are more fertile than others, and occasionally sorts are discovered that refuse to be fertilized. But in every case experience shows that the Carnation must be treated with much consideration in order to induce the production of perfect seeds. The plants, as a primary means, must be placed in a dry, airy position in a glass structure. It will be advantageous also to remove a few petals of those flowers in which the anthers are debarred from air and light, the old florists making a practice of selecting for seeding purposes those flowers only that had few petals. Once fertilization is completed the petals shortly wither, and when this does not occur it is advisable to repeat the process, thereafter removing all the petals. It has, too, been long the custom to slice away a portion of the calyx as a precaution against moisture lodging round the base of the seed-capsule and causing it to rot. The greatest care in the cultivation of the plants must constantly be exercised till the seeds attain maturity, this being indicated by the splitting of the apex of the capsule when they are ready for removal, drying them thoroughly,

and preserving the seeds intact till required for sowing the following spring. In selecting flowers the more successful raisers do not favour the largest blooms, but prefer side ones of perfect form. Those produced on drooping stems should be rejected, and plants alone of erect growth and of robust though not over-vigorous habit chosen for seed-bearers.

Seeds are sown from February, and with every prospect of success during April and May, but late sowing is naturally productive of plants that are less floriferous than those obtained from seeds sown early. I prefer ordinary cutting boxes two feet by eighteen inches by four inches in depth, to pots in which the soil becomes dry more quickly, and requires watering more frequently, for seedling raising. Soil should be rather light; loam, the siftings of orchid peat, and sand to preserve it open, forming a good compost, leaf-mould being substituted for peat where the latter is not to be had. Compress the soil only to a slight extent, and in sowing allow each seed about a quarter of an inch space; the seeds may of course be sown more thickly, but there is always a danger of loss from thick sowing, while under ordinary circumstances the box space required is not so great as to induce one to save on that and court loss in the result. The seeds if covered one-eighth of an inch will germinate regularly. To this end it is an aid to cover the boxes with a sheet of glass, blurring it with whitewash to exclude light. Place the seed-receptacles in a structure where a temperature of fifty to sixty degrees is maintained, and if water is required, dip the box with its contents for a brief moment in a tank of water, when sufficient moisture will be extracted to moisten all the soil. When germination has been effected, remove the glass and give the seedlings access to light and air, and while still small transplant them into other boxes prepared with a compost of a like nature, setting the seedlings at an inch apart, and compressing the soil somewhat



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firmly in the process. Once root-action and growth has recommenced, remove to a frame, being careful at this stage in the application of water. When the plants are an inch to an inch and a half high, they ought to be transferred to the position selected for their growth out of doors, where, if they are to remain to flower, each should be accorded a space of eighteen inches each way; but if on the other hand these are to be transplanted to their flowering quarters at the end of summer, then half that distance apart will be ample. The method of treating Carnations in the garden will be found at pages 17 to 24, and to these the reader is referred for instruction as to cultivation of soil and other matters. Meanwhile we shall resume operations in early summer, when the spindling flower-stalks demand consideration. Frequently they are left trailing and twisting about until the buds show colour, then stakes are brought out, and an endeavour made to attach the draggled stems to these; but the attempt is never so successful as to hide the fact of their having been left a prey to forgetfulness. It is much better, and wastes less time, that always precious commodity in a garden, to attack the plants as soon as the stalks have grown a few inches; and having provided a sufficient quantity of short sticks, apply one to each stalk, giving it just one tie, and no further attention will be required. A more rapid, though less tidy, but withal a perfectly efficient method, consists in sticking a quantity of short brushwood among the plants, upon which the stems rest. When the flowers begin to expand, the hopes of the florist begin to rise, and no matter whether none of the varieties are quite so good as others in cultivation, there will be sure to be some that the raiser would like to perpetuate. A few layers should accordingly be prepared of these at the earliest moment, though I have known varieties bloom so late that it was impossible to root layers the same season; but cuttings may be taken quite late in the year,

and reference may be made below for remarks on these methods of propagation. Pinks are raised from seeds with much less trouble, and may be sown in the open air.

#### PROPAGATION BY CUTTINGS

Pinks are more generally increased by means of cuttings than are Carnations, though these too are not infrequently propagated by this means. Cuttings are of three kinds. There is the cutting that in gardening parlance is broken off with a heel. That is, the cutting is originally a short side-shoot, which the operator breaks off entire from the stem, bringing with it a piece of the latter, which is called the heel. This kind of cutting can be more certainly induced to emit roots if partly broken away from the stem a few days before it is wanted to insert in the rooting material. Side-shoots of Malmaisons are generally employed in this manner, but any section may be treated in the same way. Of Pinks, the garden varieties, Mrs. Sinkins, Her Majesty, and others root freely from cuttings of this kind, and many of the Mule Pinks and species are best propagated in this way. Another kind of cutting is produced by a lengthened shoot, severed under a joint, as usual in the case of cuttings generally. The two under leaves removed, this kind is ready for insertion. Sometimes, however, and this applies mainly to strong growths inserted late in the year, it is found beneficial to split the stem up, which, being kept open by some simple wedge, is inserted in that way; while yet another method consists in putting one half the cut stem in the soil, the other half being laid flat on its surface, the idea being to provide a large rooting surface.

Then there is that peculiar sort of cutting called a "piping," confined almost solely to Pinks of the laced section. A "piping" results when the growing point of a

shoot is pulled out of its socket. They are easily manipulated. Taking the shoot in the left hand, the operator with the other pulls out the "piping," which, it is most important, should not be long, but short and soft. That is largely essential to success. "Pipings" must on no account be allowed to "flag," old-fashioned gardeners making it a point to carry a vessel of water with them and dropped the "pipings" therein as they were taken. A choice position to insert these was near the base of a west aspected garden-wall, where after being inserted and watered they were left to themselves. "Pipings" strike roots very successfully also in ordinary cold frames, shaded and kept moist, or, where there are only a few, bell-glasses or handlights may be employed as protectors. These are efficiently shaded by dipping in water and sprinkling sand on the inside. When done with, another dip removes the sand.

With regard to striking Carnations, it depends greatly on the season of year propagation is effected. The methods adopted in the case of Tree-Carnations are treated under that section, but ordinary Carnations, during summer, may be rooted in much the same manner as Pinks. In autumn the cuttings should be inserted in light soil in flower-pots, cutting-boxes, or in cold frames in shallow beds, but in all cases success follows cool treatment, the soil being kept moist and the frames close, to preserve the cuttings from flagging.

Pinks of the plumarius section and Sweet Williams are perpetuated by a kind of cutting that has already emitted roots when propagation is effected in September or October. Nothing is more simple than this method. The plants to be propagated are lifted, and the shoots pulled apart, each with its "air" roots forming a little plant. These are "lined" into a prepared bed in some suitable place in the open garden, where during the winter the production of roots proceeds, and by spring

each plant is possessed of a nice ball of roots of its own, and is in capital condition to transplant elsewhere to flower.

#### PROPAGATION BY LAYERS

Carnations are very largely propagated by this method, and also Pinks of the Anne Boleyn class, as well as some of the Mule Pinks. The earliest mention of the practice occurs in Parkinson's "Paradisus," in what is the earliest treatise on Carnations extant, where, as "in-laying," the method is detailed with much lucidity. The value of layering consists in the rapidity and the certainty varieties can be increased without weakening the resulting plants, because the connection with the parent is not severed until the scion has roots of its own abundantly sufficient to provide for its wants. A layer may indeed be said to be a cutting supported by the parent plant up to the moment it is able to provide for itself. In making a layer, the operator does not cut the shoot quite through, but as near as may be about halfway, then turning the face of his knife upwards half an inch or three-quarters of an inch in length, more is inimical, splits the stalk in two. The tongue, as it is called, thus formed is gently bent outwards away from the stem, and being inserted to its own depth in the soil and kept in place by a "peg" the operation is completed. A few important points must, however, be noted. Layers invariably produce roots most quickly when the shoots are still soft, and while in this condition all parts of the operation can be best carried out. In firming the layer in the ground, some authorities advise the peg being placed about an inch from the tongue, but the proper position is to insert it exactly at the point the tongue parts from the stem, pushing it obliquely into the ground so as to keep the tongue from being moved. Clumsy operators destroy many layers by

breaking them off the stem when bending down the shoots. This can be certainly obviated by pressing short shoots back on the stem while the layer is being placed in position, and in the case of long shoots by twisting them quite round, when they may be safely placed in any position without breaking. In the case of shoots so elevated above the soil that they cannot be layered, a simple and efficient method consists in bringing the whole plant level with the ground, and restaking it so that the layers are not raised, but left close to the soil. As to soil for layers, in light fertile ground nothing whatever is required, though in that of a heavy nature a little leaf soil and sand placed where the roots will be formed is of value. Too commonly, material is placed about the stems of the plants and the layers inserted underneath this in the ordinary soil. Another point is that a short shoot is commonly to be preferred to a lengthy one for layering. Once roots have been emitted in sufficient quantity to steady the plant when the peg is withdrawn, the connection between the parent and the layer should be severed, making the cut quite close to the layer, where roots, in due time, will also be emitted. Metal layering pegs are now sold cheaply by horticultural sundriesmen, but in the country, where bracken abounds, nothing is better than the stems of this fern cut into short lengths, bent in the middle, and used in that way.

A simple form of layer is employed by market-growers in the case of Clove Carnations. This consists in making a notch in the stem, instead of a tongue, the cut portion being pressed down and pinned into the soil, when roots are duly emitted.

In Germany, root-grafting has been attempted as a means of strengthening the constitution of weakly varieties, the plant used to supply the root-stocks being *Saponaria officinalis*—the common soapwort. Grafting and budding,

curiously enough, are very old practices, and are referred to by Shakespeare in the *Winter's Tale*, while des Serres gives a detailed account of the method, and the reason of resorting to the practice. "Pour meslanger et changer les Œillets, l'on les ente en escusson; en fente aussi; en ceste façon, tresrarement: et en quelque maniere que ce soit, est necessaire d'y apporter de la curiosité, pour la foiblesse de la plante." And then he goes on to details; stating his belief that "Piquassats," flowers white with red spots, were produced in this manner.

## XI

### PESTS AND DISEASES

RABBITS and hares are very fond of Carnations. Efficient fencing is the only remedy, but as hares leap a fairly high fence, this characteristic of puss must not be forgotten. Rats, when abundant, prove destructive during winter, especially in the case of pot plants. A vole in one instance gave me some trouble before it was secured, and it was at last caught by means of a Malmaison leaf placed in one of those open traps which, on the release of a spring, execute the victim instantaneously.

Sparrows and finches, where they abound, do much harm to Carnations by "nibbling" the foliage in early summer. It is almost impossible to protect the plants by means of netting, which is however a help. In addition, repeated dustings of soot applied when the foliage is wet, or syringing with extract of quassia, is advantageous.

Pheasants are peculiarly destructive, and are fondest of the Carnation and Pink from autumn to early summer, when the only certain method of circumventing their unwelcome attentions, is to net closely.

Cuckoo spit is sometimes troublesome. This is the larva of an insect, *Aphrophora spumaria*, allied to green fly. It is so common everywhere, that every boy or girl is acquainted with the frothy-like envelope that hides and protects it. It destroys the stems of Carnations and

Pinks, and is itself destroyed by syringing with extract of quassia.

Earwigs in some seasons are terribly destructive. They effect their way to the base of the petals, which they cut through, and occasionally reduce flowers to the bare calyx and seed-pod. As they affect a dry hiding-place, bits of dry moss secreted in small flower-pots, or the hollow stems of umbelliferous plants, placed where they are observed, afford ready means of trapping them.

Eelworm.—In Scotland, eelworm attack is dreaded as much as *Helminthisporium* on Malmaisons is in England, where its most deadly ravages are chiefly felt in the cases of the Perpetual or Tree section. This destructive pest is introduced to the economy of the Carnation by the medium of the soil, and as the almost invisible worms exist solely on the tissues of the plant, and are protected by the epidermis of the leaves, once they have effected a lodgment it is impossible to reach them. Badly affected plants should in any case be destroyed, but those only slightly affected may, by careful treatment, permitting them to experience no check to growth, and propagating only the healthy tips of the shoots, be restored to a normal condition. In America, previous to using soil, it is superheated during thirty minutes by means of steam-heated pipes, a process that destroys all living organisms, vegetable as well as insect, without lowering its qualities as a rooting and feeding medium. Eelworm is *Tylenchus devastatrix*.

Eucharis mite has been found lurking in the lower parts of Carnation stems. I have had no experience of this, the *Rhizoglyphus echinopus*, except in connection with eucharis and amaryllis, when an emulsion of petroleum applied very hot has been effective for a time.

Green fly is particularly troublesome in the case of pot plants of all sections, though it is perhaps most destructive in the case of Malmaisons, rendering not only the foliage of these unsightly and diseased, but in bad



attacks permitted through neglect, destroying the flowers also. Winter-flowering Carnations are best kept free from green fly during the winter and spring months by occasionally fumigating with tobacco-paper, or by means of a vaporizer. The last-named is also suitable in the case of Malmaisons, though perhaps no more effective aphicide exists than ordinary tobacco-powder, dusted into the growing points of the shoots, preferably at short intervals, in order to prevent green fly gaining a footing; but if applied less regularly, no time should be lost, on the discovery of aphis, in using tobacco-powder. In foliage, even slightly affected, damage is clearly apparent, but in cases where aphis has been permitted to live and propagate, if only during a few days, much harm accrues, the particular affection resulting having been called Stigmanose. This pest is generally not much of an affliction to Border Carnations, on which, if it should appear, syringing with quassia extract will be found an efficient remedy. Tits are so fond of aphis that, in hunting for insects, they are apt to break the stems of plants, hence though the insect itself is not destructive, the birds undoubtedly are.

Humble Bees.—When these are numerous, the harm they do is very great. In making a way to the base of the bloom they twist and ravel the petals into all shapes, and always split the calyx, leaving the bloom a mere bunch of rags. They may be debarred from plants grown under glass by closing all apertures with hexagon netting.

Maggot is productive of much loss unless watchfully repressed. It is the larva of a fly—*Hylemia nigrescens*, and attacks young plants, which the fly seems to select in preference to older ones in which to deposit her eggs. The attack cannot be prevented, because it is unsuspected until the maggot has commenced operations under the epidermis of a leaf, whence it finds its way into a shoot,

thence to the stem of the plant, where it lives at the expense of its host. The maggot happily betrays its existence in the leaf by the mark it and all its kind leaves on the surface, and if caught at this stage, not much harm follows. Once in the stem, however, it is difficult to locate, and in any case the mischief it has effected is irremediable. Another fly (*Phyloma*, sp.) lays her eggs on Carnations, the larvæ feeding on the foliage and stems during winter, but this is a by no means common pest.

Red spider is sometimes troublesome. Treat as Thrips.

Slugs are mischievous in the case of Alpine species, the flowers of which they are exceedingly fond of. A standing army of thrushes and blackbirds works wonders, and as a local remedy, tobacco-powder dusted over the plants may be tried.

Thrips is troublesome mostly on light and dry soils, though in dry seasons it is apt to spread all over the country. It also attacks pot plants, mostly in those instances where the treatment is averse to the Carnation. In bad attacks of this very lively little insect, the flowers are so much damaged as to be worthless. Fumigating, or vaporizing with Cory and Co.'s lethorion cones, dusting the buds with tobacco-powder, and in the case of out-door plants syringing with quassia extract or with soap-suds to which a very little petroleum has been added, are each effective. Thrips, when they appear, admit of no parleying. It is known as *Heliothrips hæmorrhoidalis*.

Wireworm is a terribly destructive foe. It is the well-known larvæ of three species of beetle, *Agriotes lineatus*, *A. obscurus*, and *A. sputator*, that feed on the roots of plants, those of Carnations proving a favourite morsel. Repeated exposure of the soil by digging, and permitting no vegetation to grow on the ground for a period, is a measure that should be carefully carried out where

the soil is known to be infested. Sowing rape-dust on the surface is said to be a good remedy, but the best seems to be mustard-waste scattered among the plants, wireworm being supposed to cherish an aversion to mustard in any form, living or manufactured. Potting soil in which wireworm exists should be spread out thinly, and turned from time to time, exposed to frost in winter and drought in summer. The measures taken to destroy eelworm by extreme heat is equally applicable in the case of these, but cannot, of course, be effected in the case of beds in the open garden.

Anthraxnose is the American name for a parasitic disease of plants which was first noticed on Carnations in England in 1902. It is described in *The Gardener's Chronicle*, vol. xxxi., third series, p. 193. "The leaves are at first spotted with small purple roundish spots. These gradually enlarge and become confluent and indeterminate, and at length brownish in the centre. Meanwhile, the leaves become sickly and commence to die off at the tips." It has been named *Glæosporium Dianthi* (Cooke).

Bacteriosis is a name applied in America to a supposed disease which has since been found to be the result of aphid bite, and now called Stigmanose.

Gout is a disease long known to cultivators, the symptoms of which are a protuberant swelling at the base of the stem, followed in most cases by the death of the plant. It is now known to be an aggravated form of eelworm attack.

Ring fungus (*Helminthosporium echinulatum*), commonly known in England as "Rust." It is very destructive to Malmaisons, having been known in not a few instances to destroy collections in a comparatively short time. It is not at all troublesome in the North of England and in Scotland, and in cases where it

has been introduced on plants from the South, it seems to naturally disappear, and, in any case, by removing the affected parts of the foliage it is certain to be stamped out without further trouble. The appearance of this pest is so characteristic that there is no mistaking it for anything else. Its appearance is heralded by a blister-like spot, which is followed by a dark-brown snuff-like production, which is the fungus in its perfected condition. At this stage the spores spread over the foliage of other plants, and gain a footing so rapidly that it is impossible to check it with any degree of certainty, and in bad attacks it is generally conceded that the best plan is to burn the plants, and so get rid of all disease and start afresh with a clean batch. Removal of the portions of foliage affected and repeated washings with some anti-fungoid wash, with Bordeaux mixture, or, preferably, with ammoniacal copper carbonate solution sprayed, are means that may be taken to repress and prevent the spread of this disease. Sufficient of the last-named to make fifty gallons of spraying material is composed as follows:—To five ounces copper carbonate, add sufficient water to form a thick paste. Add three pints ammonia to dissolve the copper, and preserve the mixture in air-tight bottles. For spraying, add one part to a hundred parts of water. *The Gardener* gives this formula—

Water, 9 gallons.  
 Strong (26 degrees) Aqua Ammonia, 15 fluid ozs.  
 Copper Carbonate,  $1\frac{1}{4}$  oz.

The copper carbonate is first made into a thin paste by adding eight and three-quarter fluid ounces of water. The ammonia water is then slowly added, and when all the copper carbonate is dissolved a clear, deep blue solution is obtained, which does not become clouded when diluted to nine gallons.

Prevention is undoubtedly largely possible if the plants,





during the winter season, are grown cool, and perfectly dry, and at no time subjected to close forcing treatment.

Rust is general mainly on yellow sections of Carnations, rendering the foliage unsightly, and in all cases weakening the plants affected. When noticed, the tips of the leaves should be cut off along with just a little of the clean portion, and the foliage sprayed from time to time, choosing a dry day for the purpose. In America another parasite, *Darluca filma*, has lately been discovered growing on the rust plant—*Uromyces caryophyllum*—and acting as a destructive agent.

Spot is a fatal affection, not only to many Carnations, but to Dianthi species. It is called *Septoria (Uredo) Dianthi*, the ammoniated carbonate of copper solution already mentioned being a sure repressive remedy, though a continuance of dull, damp weather renders abortive all attempts to stop the disease. Spot is always troublesome in low-lying, damp localities, while it rarely appears where the air is dry, hard, and bracing, and the situation open and exposed.





## APPENDIX

### ON RAISING NEW CARNATIONS

BY MARTIN R. SMITH.

To buy seed of your nurseryman and to sow it is a very simple process, and may afford a fairly pleasing result ; but to raise a really good new variety from seed of your own hybridization is a delight not easily forgotten, and in the joy of the new carnation born into the world you forget all your past labours and disappointments.

I will begin, then, with the raising of the seed. The one essential is a greenhouse, for I cannot advise any one to attempt to raise seed from plants in the open border. The first point is the choice of the class of carnations you wish to propagate. Naturally you cannot gather seed from a house of mixed carnations and expect good results. There are Flakes and Bizarres, White and Yellow Ground Picotees, Fancies and Selfs, and I would counsel the beginner to confine himself at first to "Selfs." They are hardier as a rule, perhaps better seeders, and will give a more generally satisfactory result, for the points of excellence are fewer and of less intrinsic importance. A second-class Self may look splendid in the border, whereas a second-class Flake or Bizarre is not worth the trouble of layering.

In selecting the varieties to breed from, the main points to consider are size, petal, and calyx. Size is of primary importance, for a small Self is not worth wasting labour upon, and

there are any number of fine large Selfs now in the market. Not a less important point is "petal." The petal should be large, firm, flat, and smooth on the edge (not fimbriated). Avoid varieties with many small petals in the centre. It is certainly better to breed from a flower with too few petals than from one crowded in the centre.

The shape of the calyx is also of much importance. Select as parents varieties with a long bud, as opposed to the short, dumpy buds too often seen. These short buds always burst, and there is no greater disfigurement to a Self than a burst calyx. It is a fault also that is almost invariably transmitted to descendants. The bud should be somewhat of the shape of a Martini-Henry bullet—*i.e.* with a length of about three times its diameter.

As regards colour, you can have every latitude. A really good flower may be very valuable to breed from, even if it be somewhat poor or dull in colour. Some of the best Selfs I ever raised were from "Germania," the well-known yellow Self, crossed by a dull "brick-dust" coloured Self.

It will be found necessary to nail some light netting over the windows and ventilators of the greenhouse, as a house full of carnations in bloom will attract bees in hundreds, and they will fertilize hap-hazard a large proportion of the flowers they visit in their search for honey.

Do not disbud the plants you intend to use for propagating, and do not feed them artificially, for you do not require big flowers to breed from; on the contrary, a flower that has been pushed into size by disbudding and stimulating food will very rarely seed at all.

It may be necessary to feed a little as the seed is ripening, but even this should, if possible, be avoided.

Begin as soon as your plants show flower, for the early seed is always the best ripened.

Fertilization is effected by taking upon a small camel's-hair brush a little of the pollen from the stamens of one flower and brushing it very gently and lightly upon the pistils of another, and the two main points to be considered are, first, whether the pistils are sufficiently advanced to receive the pollen, and,

secondly, whether the pollen is in a condition to effect fertilization.

The pistils are, as a rule, not ready for fertilization until the flower has been fully out for a day or two. They will then have attained their full growth, and will be found covered with minute hairs, which retain and utilize the pollen. It is but waste of time to attempt to fertilize pistils that are not thus covered. The pistils remain sensitive to the pollen until the flower is past its best or has even begun to fade.

The pollen is ready for use the instant the pollen cells crowning the stamens open, and the sooner it is used the better. It is, however, above all things essential that it should be absolutely dry. It is of little or no use to attempt fertilization in damp weather or when the pollen comes from the stamens on to the brush "cloggy" or lumpy. It is at its best when it comes away in a fine, impalpable powder. The hotter and brighter the weather the more certain will be the fertilization of the flower, and it stands to reason therefore that no shading should be used, and that the middle of the day is the best time to select.

The pollen very rapidly deteriorates, and even by the second day will be often found to have turned yellow and to adhere to the brush in lumps. It is then useless for purposes of fertilization.

The maturity of the generative organs differs greatly in all varieties. In some—perhaps the majority—the male organs—the stamens—are ready first; in others the pistils or female organs. Again, in some few maturity is almost simultaneous, and from such varieties the hybridizer is apt, unless very careful, to collect and sow seed "self fertilized," with a very disappointing result to follow.

Mrs. Reynolds Hole is an instance of this tendency. It has a pendulous habit. The pistils ripen early, and the moment the pollen stamens open the pollen falls on the pistils and the mischief is done.

When the flower is crossed a small label should be attached to it, giving the date and the name of the pollen used. If the fertilization has been successful, it will be found on the second

morning—earlier if the weather is hot—that the flower has shut up or collapsed, and you may then mark the label (I snip off a corner of it) and consider the cross as “sure.”

In some varieties the evidence of fertilization is given by the pistils rotting away, the flower continuing fresh.

The seed will be fit to gather in six or seven weeks after fertilization, and each pod as taken from the plant should be placed in a small envelope and marked with the names of the parents. These envelopes should be kept in an airy, dry place until it is time, later in the autumn, when they are perfectly dry, to open them.

When the petals of the impregnated flower are quite dead, it is well to pull them out of the calyx, as they attract damp, and may lead to the rotting of the seed-pod. In gathering the seed a pod will occasionally appear rotten. Examine it before throwing it away, as it may contain one or two seeds as yet unaffected, and those will germinate.

The harvested seed may be taken from the pods during the winter months, and stored again in little envelopes endorsed with the names of the parents. It will keep thus indefinitely. I have sown seed three years old which germinated perfectly.

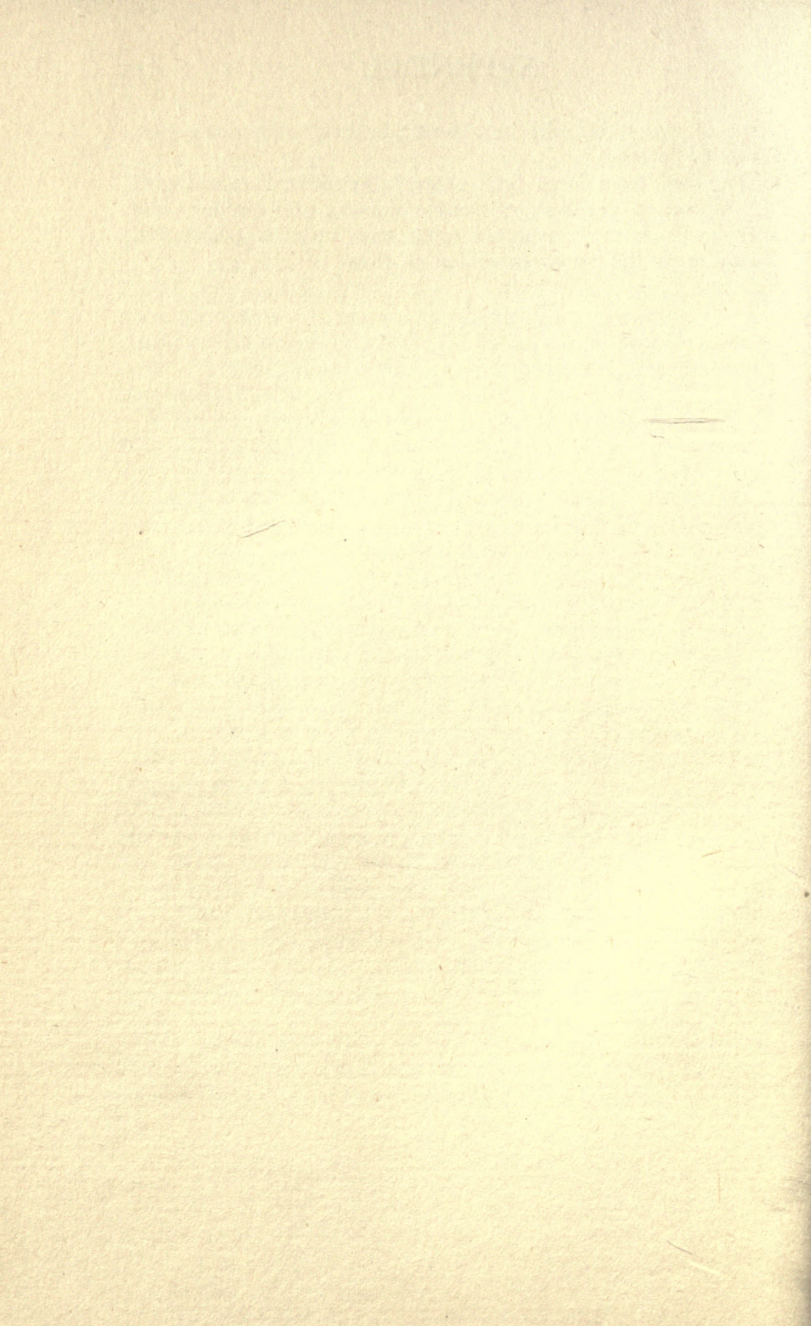
I sow my seed towards the end of February in shallow pans, and a very sandy soil. In about a month or five weeks they are ready to prick off into shallow wooden boxes, with a better soil, and here they may remain until they are planted out, say, towards the end of May.

The bed to receive them should be double-trenched, and contain in the bottom of it a liberal dressing of rich cow-dung, care being taken that the roots of the young plants do not come within four or five inches of it. As they grow and make their roots, these reach down into the cow-dung, and take from it the nutriment they require. The same dung, if put in contact with the roots when the young plants are placed in their flowering quarters, would kill the greater part of them.

The plants may then be left to take care of themselves through the autumn and coming winter. It is well to keep pinched back any premature growth. The following summer

many of the plants will be almost "bushes," and give a profusion of flowers.

The seed from large Sells properly hybridized should give 50, 60, or 70 per cent. of double flowers, and among these may be confidently expected some new varieties which will amply repay the labour expended on them.



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