

THE BULLETIN OF THE  
**HARDY PLANT**

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# FOXGLOVES

The foxglove bells, with lolling tongue,  
Will not reveal what peals were rung  
In Faery, in Faery  
A thousand ages gone.  
All the golden clappers hang  
As if but now the changes rang,  
Only, from the mottled throat  
Never any echoes float.  
Quite forgotten in the wood  
Pale, crowded steeples rise  
All the time they have stood  
None has heard their melodies  
Deep, deep in wizardry  
All the foxgloves belfries stand.

Should they startle o'er the land  
None would know what bells they be!  
Never any wind can ring them,  
Nor the great black bees that swing them  
Every crimson bell, down-slanted  
Is so utterly enchanted.

Mary Webb

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THE BULLETIN this year is somewhat forward-looking, reporting work in progress on both lobelias and epilobiums. When the time comes that these plants are available for our gardens our pride will know no measure in having watched the progress of their breeding.

Some members give generously of their time to the interests of the Society and one such is Kenneth Beckett. He has written a near complete account of the genus trillium, which we present as a check list. He would be glad to hear from anyone who has a collection of these plants, or any further knowledge.

If, to the amateur, this edition of the BULLETIN seems to be too specialised, he should curb his impatience because there is much to come from the Editor's desk within the next few weeks in celebration of our Tenth Anniversary. The year 1967 will bring a special publication as well as a Bulletin and the Committee is also planning a full programme of events.

Let it be another year of growth for the Society.

**Kay N. Sanecki**  
*Hon. Editor*

**COVER**

The yellow-flowered *Trillium luteum* makes a striking portrait from the camera of Donald F. Merrett. The boldly blotched leaves fold away from the flower hiding much of the stem.

# A BRIEF SURVEY OF THE GENUS TRILLIUM

by KENNETH A. BECKETT

*Deputy Editor of Gardeners Chronicle*

Few genera have a more appropriate name, for trillium is derived from *trilix*, meaning triple, and as anyone who has even cursorily examined a trillium will know, the trimery of its parts is the most outstanding feature.

The wood lilies, as species of trillium are popularly known, are primarily North American in origin, with some species in east Asia extending from the Himalayas to Japan and Kamchatka. Approximately 40 species names are recognised by some authorities, but it is doubtful if as many as half of these merit separate specific rank. Probably little more than a dozen are in cultivation in Great Britain. (If there are keen trillium enthusiasts with more, I should like to hear from them.)

Practically all are natives of woodland or other moist shady habitats. In cultivation similar situations should be found. Ideally, light woodland with a moist, but not waterlogged, soil, rich in humus should be chosen. A north facing border, preferably sheltered from the north-east, or the north side of a shrub or shrub border is equally good. On the other hand, a number of species will flourish in the open border provided that there is shelter from wind and the soil is always adequately moist.

Propagation is usually by division of the rootstock, which in mature specimens is a cluster of rhizomes. In some species the rhizomes are fleshy and tuber-like, in others they are more slender, with an accompanying growth of fibrous roots. It is stated that division should be done during the dormant season, late summer to autumn being ideal. From personal experience I have found that they also move very satisfactorily just as they finish flowering; rather like snowdrops. The operation must of course be done with care, and the divisions must not be allowed to dry out under any circumstances. Seed may be sown and if one is patient it is the best way to increase one's stock numerically. However, even when the seeds are sown as soon as ripe, germination usually takes 18 months and the subsequent seedlings take up to five and more years before they flower.

Unlike many of the genera of *Liliaceae*, for example, liliium, tulipa, scilla and convallaria, which have petaloid sepals, those of trillium are clearly differentiated and are generally green and smaller than the petals. Indeed, so distinct and clearly definable is the genus trillium, in this and other characteristics, that some authorities place it in a family of its own—*Trilliaceae*—along with its only other near ally, *Paris*. *Trillium* may be roughly divided into two main groups; one where the flower sits stemless at the junction of the three leaves—as typified by *T. sessile*, and the other where the flower is borne on a peduncle from the same junction, as in *T. grandiflorum*. It will be easier, however, for the purposes of this survey to discuss the names in the literature alphabetically.



*Trillium sessile* is the type for quite a large group of these plants. Stout of growth and fragrant it makes a good woodland plant in light shade.

Photo. A. T. Johnson.  
by courtesy of Graham S. Thomas.

*T. album* Small, comes from North Carolina, Georgia and Tennessee. It is little more than a white-flowered form of *erectum* and need not concern us further.

*T. X amabile* Miyabe and Tatew., is an alleged hybrid between the Japanese *smallii* and *kamtschaticum*, with larger flowers than either and well developed, ovate orbicular, purple petals. It is known only from the island of Hokkaido.

*T. catesbeii* Elliott is similar to *cernuum* in appearance, but the petals are undulate, arching and much longer than the sepals. Dr. Rendle considers this plant to be a distinct form of *stylosum*, which in turn is only a variant of *cernuum*. It is now rare in the wild and may even be extinct.

*T. cernuum* Linn. has the delightful vernacular name of "bashful Benjamin". It has a wide distribution in the U.S.A. and Canada, being found in the woods of Newfoundland west to Manitoba and south to Minnesota and North Carolina. This is a species with a more or less fibrous root system surrounding the ascending rhizomes. The leaves, which can range up to 6 in. long, are rhombic-ovate, tapered to a point and narrowed to a short petiole. They are set on a stem approximately 5 to 8 ins tall. The flower is white or pink and borne at the end of a short peduncle so strongly nutant as to all but hide it beneath the foliage—hence the common name. The pink form is designated *T. c. tangerae*. A broadly ovate, dark-red berry follows the sweetly-scented flower. It is easily grown in a peaty soil.

*T. chloropetalum* Howell, is, in the strictest sense, the large western form of *sessile* with greenish-yellow petals. It was at one time considered to be a form of *giganteum*, which in turn is only the large western form of *sessile* with the usual maroon-purple flowers. When it was realised that the western form varied in the colour of its flowers and that therefore only one name was needed to represent it, *chloropetalum*, being the oldest was given priority over *giganteum*. It is a variable plant, but easily distinguished from *sessile* by its more robust habit, attaining a foot or more at flowering time, and brownish-purple mottled, broadly ovate leaves, approximately 6 in. long. The flowers can be as much as twice the size of *sessile*, ranging to 3 in. long and varying in colour from maroon through red, pink to greenish-white and yellow. It occurs in the wild from Washington State down into California. Cultivation is easy and it will flourish in the open border.

*T. crassifolium* Piper, is no more than a dwarf form of *ovatum* with curiously thickened leaves.

*T. declinatum* Gleason, is a white-flowered species which would seem to have close affinities with *grandiflorum*. It is not in cultivation in this country as far as can be ascertained. C. H. Grey maintains that this native of Ohio, south Michigan and Missouri will thrive in full sun in a moist position.

*T. decumbens* Harbison, was found in 1901 in the Sand Mountains of north-east Alabama. From Greys description it appears to be an aberrant form of *sessile*. The stems are almost prostrate and densely pubescent; flowers brownish-purple. Not in cultivation.

*T. discolor* Wray, is undoubtedly a form of *sessile* and has, in fact, been known as *sessile* var. *wrayi*. However, it is convenient to discuss this somewhat puzzling entity under the above heading. Grey's description suggests that it is a distinct form of *sessile* with more handsomely marked foliage and sulphur-yellow flowers. *The R.H.S. Dictionary* states that the flowers are "dark purple varying to green"; Farrer comments "greenish". Who is right, I wonder? A plant of this name was shown by the firm of Veitch in 1890 and received an Award of Merit. Certainly the yellow-flowered plant of Grey would seem to be worth obtaining.

*T. erectum* Linn. (syn. *rhomboideum* and *acuminatum*) has some quaint vernacular names: stinking Benjamin, birthroot and squawroot being a few of them. It is not uncommon in the eastern United States and Canada, extending as far south as Pennsylvania to Tennessee. From a stoutish rhizome a number of sturdy stems arise, topped by prominently nerved, broadly rhombic-ovate, acuminate leaves. The peduncle is usually straight, up to 4 in. long, but often less and topped by an inch long flower that may be crimson or dark purple. *T. e. cahnae* has purple and white flowers, *viridiflorum*, greenish, *luteum*, clear yellow and *albiflorum*, white. Generally speaking the scent is rather unpleasant, but in *blandum*, with fuller, creamy-white flowers, it is described as "not ill-scented". As with some other species polymery occurs and a form designated *polymerum* has its parts in multiples of four or more.

*T. flexipes* Raf. would appear to be close to *cernuum*, and is distinguished by its courser growth, sessile leaves and much larger white flowers. *T. f. walpolei* is similar, but with maroon or purple flowers. Almost certainly it is not in cultivation.



*Trillium grandiflorum*, probably the most commonly grown species in the British Isles, has good green leaves, strongly veined, and shining white flowers.

Photo. J. E. Downward.

*T. govanianum* Royle, is interesting from a taxonomic point of view, in that it may well represent a link between *Trillium* and *Paris*. Although the leaves and perianth parts are in the usual multiples of three and not the four and more of *Paris*, there is still a strong resemblance in the erect flowers with long, narrow, purple petals and comparatively long spreading stigmas. It is a small species, rarely exceeding 4 to 6 ins. high in its native Himalayas. The slender, rigid stems and 3 in.-long, ovate, shortly petiolate leaves are a bright green and distinctive. This little species is more quaint than showy and of no great garden worth, and is probably not in cultivation.

*T. grandiflorum* Salisb. is the plant most people visualise when the names trillium, wood lily or wake robin are mentioned. It is an extraordinarily variable species in its native North America. Indeed, in the past many of its forms were given separate specific rank. In cultivation in this country it is usually represented by a vigorous form with broadly ovate, lustrous-green leaves with strongly impressed veins, and glistening white flowers. The latter may be as much as 3 in. long, with wavy-margined, obovate petals and set upon sturdy peduncles somewhat inclined at the top. This robust species is a good garden plant and will tolerate drier conditions than some of the others. It is the only species grown at all widely in this country.

The following names represent forms of mutants of *T. grandiflorum*, or entities closely allied: *T. g. chandleri*, is a mutant without leaves, their place being taken by enlarged sepals; *gleasoni*, is a large-growing form, with broadly rhombic-ovate, sessile leaves borne on stems that may reach 2 ft. in height; *elongatum* has lance-elliptic leaves and very narrow petals; *lirioides*,

has ovate leaves on definite petioles; *T. g. parvum*, as its name suggests, is smaller in all its parts, and has flowers that soon turn pink, fading purplish-pink. Along with *chandleri*, the remainder are teratological forms: *polymerum*, has its parts in multiples of four, five or more and *dimerum*, in twos. A number of double-flowered forms are known, and at least one or two are in cultivation. One such form gained an Award of Merit at the R.H.S. Chelsea Flower Show this year (1966), when shown by Major and Mrs. Knox-Findlay, Keillour Castle, Perthshire. *T. g. petalosum* covers the extreme double form in which ovary and stamens are petaloid.

*T. hugeri* Small, (syn. *cuneatum* Raf.), is of the *sessile* group, from North Carolina south to Florida. It would seem to be a distinct form of *T. sessile*, with scarcely mottled leaves and shorter petals. According to Grey, the flowers have a musk scent.

*T. kamtschaticum* Pall., is also *pallasii* Hulten (and *obovatum sensu auct.* Japon., non Pursh). This species comes from Kamchatka and north Korea, where it occurs in birch woods. It grows to 20 in. high with 4 to 5 in. long, rounded, acuminate leaves. As the synonymy suggests, this species can be thought of as a western extension of *T. ovatum* across to north-east Asia. It would appear not to have been in cultivation in Great Britain.

*T. ludovicianum* Harbison, is also of the *sessile* group and should be thought of as a form of that species.

*T. luteum* (Muhl.) Harbison, again is of the *sessile* group, but very distinct. The sessile, strongly purple-mottled leaves are ovate and borne on stout glabrous stems. The flower is large for the group, with petals  $2\frac{1}{2}$  in. long. In the best forms the lemon-scented flowers are buttercup yellow, but more greenish-yellow forms are not uncommon. This desirable plant is not difficult to grow and should still be in cultivation in Great Britain. Although distinct in appearance it is obviously so close to *sessile* as to be considered merely a variety of it. In the wild it is only found in the Cherokee Indian Reserve of North Carolina.

*T. morii* Hayata, was collected in the island of Formosa in 1910 and differs from *kamtschaticum* in minor characteristics only.

*T. nivale* Riddell, is a charming little species from Ohio to Wisconsin and may be thought of as a tiny *grandiflorum*. Overall size rarely exceeds 6 in. high and the petioled, ovate-obtuse leaves range from  $\frac{3}{4}$  to 2 in. long. The short peduncle is topped by an inch-long blossom of white, with oblong petals striped pink at the base. It is almost certainly in cultivation in this country.

*T. ovatum* Pursh., is also *obovatum* of Hooker—but not of Pursh., which is synonymous with *erectum*. It represents *grandiflorum* on the western side of the U.S.A. and is obviously closely akin. The main distinguishing characters are narrow leaves and petals and the rapidity with which the petals turn pink after anthesis. *T. o. stenosepalum* is a minor variant, with a more slender habit and purplish stems. *T. scouleri*. Rydberg and *venosum* Gates are probably synonymous with it.

*T. petiolatum* Pursh., is another sessile-flowered wood lily, but amazingly distinct by reason of its cordate, long-petioled leaves. It has been found in Idaho, east Oregon and Washington States.



*T. pusillum* Michaux, includes *ozarkanum* of Palmer and Steyermark. It is a slender species, with narrowly oblong, sessile leaves, on stems that may be as little as 4 or as much as 12 in. high. The lanceolate petals are usually less than 1 in. long, white, soon turning pink and aging purple. Like *catesbeii*, this species has affinities with *cernuum*.

*T. rectistamineum* (Gates) St. John, appears to be an ally of *sessile* from Georgia and Florida. Mottled, deltoid leaves and erect purple flowers with reflexed sepals are its main characteristics. Not in cultivation.

*T. recurvatum* Beck., from Greys description sounds very much like *petiolatum*, but with ovate-acute, long-petioled leaves—often mottled grey or whitish—and flowers with incurved, concave, maroon petals. A native of moist woods in Ohio, Mississippi and Arkansas.

*T. rivale* S. Watson, is a real little rock garden gem among the trilliums, occurring in the wild on stream banks in the mountains of Oregon. The ovate acute, subcordate, petioled leaves often almost hug the ground, but may be on stems 6 or more inches high in shady places. They rarely exceed 2 in. long and subtend the relatively long peduncle with its inclined tip and terminal white flower. Individual petals are triangular-ovate-cordate, glistening white, often splashed and spotted pale purple; (rose-carmine according to Grey). This species is akin to *nivale* of southeast U.S.A. and resembles it in many respects. It should be in cultivation in Great Britain and presents no cultivation difficulties.



Above: *Trillium cernuum* photographed by J. E. Downward and below *T. undulatum* photographed by the author in its natural habitat in Maine, U.S.A.



*T. rugelii* Rendle, comes from the mountains of North Carolina and Georgia, and would seem to be of the *grandiflorum* group. It is of similar size, with broadly rhombic, strongly three-nerved leaves. The flowers are small for the size of the plant, somewhat nodding, the petals and sepals of equal length. Not in cultivation.

*T. sessile* Linn., has been frequently mentioned in this survey as the type for a number of allied or otherwise similar entities. It is a sturdy species, with dark green, thickish stems and sessile, ovate, or nearly orbicular, dark green leaves frequently mottled pale green or whitish. The sweetly-scented, erect stemless flowers sit tight in the centre of each leaf whorl. They may be maroon purple or greenish-yellow. The petals stand erect like rabbits' ears at anthesis, gently splaying out soon after. They vary from narrowly oblong to oblanceolate, acute or sub-obtuse, up to 1½ in. long. The sepals are a little shorter and spreading. In its native eastern U.S.A. it is sometimes known as toadshade. *T. sessile viridiflorum* Beyer, is the name given to distinguish the yellowish flowered forms.

*T. simile* Gleason, may be dismissed as akin to *rugelii*, but with petals a little longer than the sepals.

*T. smallii* Maxim., is a Japanese species from moist woods and wet meadows. It is a pity the earlier synonym of *apetalon* Makino could not be retained for it adequately described the most distinctive characteristic of this species, namely its lack of petals. The stems may reach 8 or 9 in. but are usually less, with sessile, broadly rhombic-ovate prominently nerved leaves. The purple-brown flower sits on an arching peduncle which may be nutant at anthesis. It consists of three, thick-textured, ovate oblong sepals, each about ¾ in. long. Occasionally, petals are present, but if so they are very small. Although it has no great garden value it may well be in cultivation. It certainly is in Great Britain, because I brought back a couple of plants from Japan this spring.

*T. stamineum* Harbison, is another of the *sessile* tribe, with mottled leaves and foetid-smelling, dark purple flowers.

*T. stylosum* Nuttall, (syn. *T. nervosum* Elliott,) comes from Carolina and Tennessee, south to Georgia and Alabama. It is doubtless a pink-flowered form of *cernuum*, with possibly narrower, more ovate leaves. It may be synonymous with *T. c. tangerae*.

*T. tschonoskii* Maxim., is a white-flowered species from Japan and Korea, where it is found in shady places in the mountains. It ranges in height from 6 to 18 in., with rhombic, orbicular leaves, prominently five-nerved. The nodding flower is set upon a slender peduncle. Both sepals and petals are approximately 1 in. long, the petals sometimes a little longer and more broadly ovate. Possibly in cultivation. *T. t. violaceum* has pale rose-purple petals.

*T. underwoodii* Small, is a good form of our old friend *sessile*, with musk-scented, purple flowers up to 3½ in. long. The typical foliage is mottled in various shades of green. A native of Florida, Alabama and North Carolina.

*T. undulatum* Willd., is the painted-lady or painted wood lily, of woodland throughout the north-east quarter of U.S.A. It will tolerate drier conditions than most trillium species—I have found it in quite dryish conifer woods in Maine—though it grows more vigorously with adequate moisture. It is a

slender, elegant plant, with distinctly petioled, broadly lanceolate leaves that taper to a fine point and are often wavy-margined. A short peduncle carries the 1½ in.-wide blossom, each white, wavy-margined petal prettily marked with a basal horse-shoe of carmine-purple rays. This is followed by a conspicuous ovoid red berry. There are a number of forms, mainly of aberrant mutant types. *T. u. polymerum*, has its parts in multiples of fours to eights, (there is a dimerous form recorded); *cleavelandicum* has the sepals enlarged to almost leaf size and the leaves in whorls of three to six; *striatum* bears white-striped sepals.

*T. vaseyi* Harbison, from woods high in the Alleghany mountains is almost certainly a variant, and probably merely a synonym of *erectum*. From Greys' description, one would gather that it has smaller, less attractive flowers.

*T. viride* Beck (syn. *viridescens* Nutt.) is similar to *sessile viridiflorum*, with narrower green petals often exceeding 3 in. long. The leaves too are narrower, tapering to a fine point.



## LOBELIA CARDINALIS AND HYBRIDS

H. C. PUGSLEY

**T**HE bold striking colours and handsome foliage of these plants have caused gardeners to take an interest in growing them for many years. As far back as 1777 the first hybrid between *L. syphilitica* and *L. cardinalis* was raised. Since that time crosses between these two species have been made by numerous hybridizers. In some areas in North America the two species grow together or closely adjacent, but even so, few plants of a hybrid nature have ever been recorded.

I began experimenting with these plants in 1951 with the idea of increasing the range of colours, and if possible the winter hardiness when grown in the open in this country. A good form of *L. cardinalis* cv. 'The Bishop' was used with *L. syphilitica* blue. This produced F<sub>1</sub> plants with pale green leaves and almost sterile petunia purple flowers, which last well owing to sterility. They were very strong growing, and proved hardy in the open ground for a considerable number of years. To obtain an F<sub>2</sub> generation was a little difficult, but this was done by pollinating flowers of the F<sub>1</sub> hybrid back with *L. cardinalis*. This F<sub>2</sub> generation was grown in quantity, some 200 plants in all, and as was to be expected, produced plants with flowers in many colours, and some with more flowers in the raceme, colours included magenta, Turkey red, dianthus purple, ruby red, rose madder, lavender violet, flax blue, gentian blue,

imperial purple, etc. The flowers were, however, usually smaller than *L. cardinalis*, and a few may have been tetraploid forms. The leaves were either green, purple or intermediate between the two. Purple-leaved forms are recessive to the green-leaved plants. The wild forms of *L. cardinalis*, including the Mexican strain (the so-called *L. fulgens*) and *L. syphilitica* are all diploid  $2n=14$  but *L. X vedrariensis*  $2n=28$ , an  $F_1$  hybrid between *L. syphilitica* blue and *L. cardinalis* 'Queen Victoria' with violet purple flowers, was made into a tetraploid after treatment with colchicine by Dr. Mare Simonet about 1945; this plant is therefore fully fertile, and as the chromosome number was doubled, it breeds true. *Lobelia X vedrariensis* is the most winter-hardy lobelia that I grow here in Derby.

W. M. Bowden of Ottawa, Canada, has done a great deal of research work on *Lobelia X* 'Speciosa Sweet' the correct name for all *L. cardinalis X L. syphilitica* hybrids, and has now reached the conclusion that *L. cardinalis* was evolved from a syphilitica-like ancestor. He also found that the large flowered, dark-leaved *cardinalis* forms lacked hardiness in winter, and this he concludes is inherited from the cold-susceptible Mexican strains (often called *L. fulgens*) but now reduced to subspecific rank under *L. cardinalis* by Dr. Rogers McVaugh. W. M. Bowden is at present working on lobelia tetraploid hybrids  $2n=28$  with very large flowers in many flowered racemes and in numerous colours; these set seed when selfed or crossed, and it is hoped to produce a really hardy strain from these plants; so many good hybrids when grown on for three or four years eventually lose vigour. I am certain that many of the older varieties of lobelia are infected with virus, and this makes it more important that good new varieties are raised.  $F_1$  hybrid vigour, so characteristic of some of the crosses I have made with these plants, is soon lost in the  $F_2$  generation. I have found among my own  $F_2$  seedlings dark red leaf colour and large flowers are linked with cold susceptibility, and W. M. Bowden working in Ottawa finds this difficulty in the way of progress.

As regards cultivation in this country, seeds should be sown on the soil surface in pots during January in heat, when strong flowering plants can be obtained by autumn. They need to be planted either in full sun or slight shade but in positions where the soil will remain moist during the growing period, so humus should be added to the soil. If covered over with peat they will often pass the winter safely, otherwise lift and store in a cold frame.

I am hopeful that in the future a strain of hardy fertile large-flowered hybrids in mixed colours will be produced, and in raising the plants from seeds the vigour may be maintained year after year. If a particular colour is required the plants can readily be increased by cuttings taken in the autumn and potted separately when they should be kept just growing in a greenhouse or heated frame during the winter. It is asking for failure to do this over a period of many years when the hybrid vigour will be lost, neither is it wise to leave the clumps in one position for years without division, although I have had plants remain outside for up to five years without attention.

#### REFERENCE

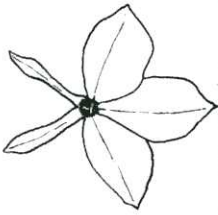
Bowden, W. M. *Cytogenetics of Lobelia X Speciosa Sweet* 1964. (Canadian Journal of Genetics and Cytology Vol. 6 No. 2 1964).



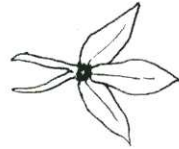
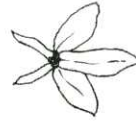
*Lobelia syphilitica* ♀

×

*Lobelia cardinalis* The Bishop ♂



F<sup>1</sup> all purple.



Violet.

Salmon pink.

Ruby red.

F<sup>2</sup> wide range of form and colour. (Three typical examples shown)

H.C.P.

# HARDY PERENNIALS IN THE NORTH

## Some Plant Personalities from Harlow Car

GEOFFREY SMITH

A great deal of ingenuity and thought, plus a sound knowledge of plants, is required to achieve a perfectly balanced herbaceous border. To create a picture using herbaceous perennials only, the colours subtly blending or contrasting as the occasion warrants, preserving at the same time an essential air of complete informality must be every gardener's dream.

Personally, I feel it wrong to divide the garden into herbaceous borders, shrub avenues, and rock outcrops, for inevitably the sense of continuity is completely lost, and with it the comforting harmony so essential in a well-planned garden. One of the loveliest picture borders here is of a pale blue delphinium against the delicate pink of the shrub *Rose alba* 'Celestial'. The beauty of the summer would have been dimmed a little had the delphinium been rigorously restricted to the confines of the herbaceous border.

A garden composed entirely of shrubs does not show any dramatic change between season and season. Once planted the pattern is a repetition, beautiful undoubtedly, but with herbaceous plants added to provide contrast and emphasis, interest is renewed each year. To make the most of a small garden the whole vast storehouse of shrubs, herbaceous plants, and bulbs must be plundered, for only then can true satisfaction be achieved.

Even more frustrated are the people who sigh for the tropical warmth of the south, when they would be better counting the blessings of a northern garden with the attendant joys of meconopsis, gentian, and the host of plants which revel in the moist coolness of Yorkshire, yet are but a fleeting travesty of their true selves in hotter, drier areas.

One of the earliest plants to show colour in the borders here as winter gives way to spring is *Euphorbia epithymoides*; the brilliant yellow bracts which surround the flowers fresh against the young green of the leaves. A pleasant mound of a plant which retains the beauty of leaf throughout the summer. Unlike some of the genus whose ground-hogging qualities make them veritable Prussians of the garden, *E. epithymoides* makes no outrageous territorial claims. *E. griffithii* does not show the same consideration, but is such an attractive picture in May that where a corner can be spared, it will amply repay the planter with a massed display of glowing orange copper bracts. In shade it will grow up to 3 ft. high, but in dry soil and full exposure only 18 in. to 2 ft. I like to grow it in association with the glaucous grey of *Juniperus X media pfitzeriana*. The corner so furnished requires little further embellishment, the euphorbia provides interest from May until early August.

Plants which have a wealth of legend grown up around them always make a particular appeal; the wind flower of early spring is well endowed in this respect. The beauty now is tinged with sadness, the anemos wind has been changed by soulless botanists for *pulsatilla*, a name of unknown origin and no beauty. One could well believe the tears of Venus from which the first anemone sprang would flow even faster than they did for the dead Adonis, were she aware of the change. Glorious in flower, with silvered leaves, possessed of the delicacy of lace, these would be surely enough to ensure for *Pulsatilla vulgaris*, the Pasque flower, a firm place in our affections, but then in July–August the silvery tasselled seed heads bring an added lustre to a plant which is altogether beautiful. Deep, humus rich soil, well-drained yet moisture retentive, and a position in full sun is little enough reward for the joy these plants bring to the garden. In the type species the flowers are deep violet, but colour forms include 'Mrs. Van der Elst' pink, 'Red Clock' rich red, 'Budapest' soft blue, and 'Caucasica' soft primrose yellow, which does remarkably well here.

The aconites have for many years been poisoned in the English garden by their own venomous reputation. True the roots do contain a deadly poison, but few gardeners are given to devouring the roots of herbaceous plants, so the cultivator runs little risk of a premature departure from this world, and need not deny to the garden a race of plants possessed of many sterling qualities. Indeed, in the rough and tumble of the open garden the aconite is better able to take care of itself than the closely related delphinium, tolerating a moist soil and shade with complete equanimity. *Aconitum napellus* 'Bressingham Spire' is a sturdy cultivar in flower for several weeks, the main spike of violet blue flowers if carefully cut back, is followed by a second crop of short side spikes. The growth is neat and erect up to 3 ft. on a moderately rich soil, the season July to September.

Where shelter can be provided the form of *Aconitum wilsonii* known as 'Barkers Variety' is well worth inclusion. The bright blue flowers on 4 ft. stems open with the *auratum* and 'Bright Star' lilies. Grow them all together against a background of *Prunus sargentii* and other shrubs notable for autumn colour, then nowhere will there be a moment of regret for departing summer.

Asters bring to mind the legions of Michaelmas daisies which look so lovely massed in the border when lit by September sunshine. Of all the many beauties arrayed to tempt the affection it is to a species I would grant pride of place. *Aster thomsonii*, in contradiction to the experience of others, flowers in this garden from early July to late October; a perfect treasure of a plant. The flowers are a good lilac blue, brighter than the description indicates, carried just above the grey-green foliage on 18 in. stems. In the borders it has to contend, unassisted, with a heavy, badly drained clay, in my own garden it has a choice position against a south-facing wall. A beautiful hybrid between this and *A. amellus* is *A.* 'Frikartii' 2½ ft., with light blue flowers, relieved by a yellow central disk.

Gardens on a heavy clay usually boast a moist corner in partial shade, which for some reason the owners look on as a liability rather than an asset.

There are so many lovely herbs, which though capable of standing a full exposure remain fresh and unblemished for a longer period with a little overhead shade. *Senecio przewaskii* is an unfailing drought-indicator in the dry open border; growth is stunted, the leaves hang limp, and the whole appearance is depressing in the extreme. Given a moist soil it reaches up to a graceful 5 ft., the spider-like orange flowers looking strangely lovely against the purple stems. The leaves when fully developed are deeply divided, green underlaid with purple near the veins. One plant can establish a theme, or more correctly suggest an association and if this is carried through, the completed landscape has a comforting aspect, a harmony which somehow never materialises in a haphazard design.

*Senecio przewaskii* enjoys the company of the hosta, the deeper coloured but lighter plumed astilbe, meconopsis, kirengeshoma, and the willow gentian. Strangely enough, the candelabra primula looked stumpy in the rather elegant company, and lovely though they are, had to be moved to the more congenial surroundings of the fern and bamboo bed.

The hostas present a slightly bewildered air, and have my unstinted sympathy. To suffer so many changes of name, and even now experts disagree on which species shall be applied to which plant. I very quietly address them still as funkia, and am quite decided on the specific character of our plants, only using the more recent appellation of hosta when wishing to impress a respected visitor. In fact, it is immaterial by what name they are known, these plants possess a beauty of leaf which transcends such trivialities as mere botanical detail. All species grown here have this attractive foliage, some spear-shaped, some almost round. Pride of place must go to *H. fortunei* with glaucous leaves 18 to 24 in. in height, the mauve flowers open in July. Another very handsome species with blue-green rather deeply-veined leaves is *H. sieboldii glauca*, or as some experts have it *H. glauca*, again the flowers are mauve. Finally, *H. albo marginata* which like so many of the really outstanding plants in the herbaceous border, came from Mr. Alan Bloom. This a compact mound of a plant, the almost pea-green leaves edged with a cream-white band.

Astilbes, as mentioned previously, must possess a light elegant plume, or like the primula grow better with the ferns as company. *A. davidii* a late flowering species with slender spikes on wiry 4 ft. stems in August is quite suitable, as are 'Gloria', soft pink, and 'Ostrich Plume', rose pink at 3 ft.

The meconopsis species enjoy the moist humus-rich soil and light shade. Both *M. betonicifolia* and the albino form flourish in company with the senecio. The blue and white is in cool contrast to the hotter colours around. *M. grandis* must be included, but never so the larger blue flowers can be seen at the same time as those of *M. betonicifolia* for there is no love lost between the two, and certainly nothing is gained by comparison. Other meconopsis grow there, biennial, unfortunately, but the stock maintains itself by self-sown seedlings.

*Kirengeshoma palmata*, a most lovely plant grows in several parts of the garden. As befits this treasure, care is taken to provide a humus-rich, moistur retaining soil, with just sufficient broken shade. I am not sure whether a plant growing through a glaucous leaved conifer, or those in the senecio bed are the



best situated. In late August the deeply divided, five-lobed leaves are topped by arching 4 ft. stems bedecked with waxy flowers of soft yellow.

For some years I tried to find a willow gentian, sufficiently late flowering to act as company for the kirengeshoma, and at last succeeded after collecting something like eight different forms. This particular plant came from Holden Clough, is only 18 in. high, and has pleasing clean blue flowers.

Iris complete the picture—forms of *I. sibirica*, *I. chrysographes* and *I. forrestii*. It is extremely hard to make any choice of a single species from so vast a genus. So to reverse the usual procedure, and say, in this garden the tall bearded iris are almost the ugliest plants I ever wish to see.

*Chelone obliqua* somehow manages to give the impression just by its name of not being hardy, and for two years deluded me into treating it with a tenderness almost amounting to reverence. Only after a large group of erigeron and some *Saxifraga fortunei* had been smothered to death was its status reduced to that of a normal hardy perennial. Now with room to expand this unusual and attractive plant, rather like an ambitious antirrhinum, with flowers of deep rose on 30 in. stems, attracts a great deal of attention in July–August, and positively revels in it.

Coreopsis species have a prim elegance which is disarmingly appealing. The two which do well at Harlow Car are the cultivars ‘Grandiflora’ and ‘Golden Shower’; were it not for the fact that both came from reliable sources I would swear them identical. The upright, deep green bushes, rather sparsely clad in tiny, narrow leaves, are gay with golden flowers from late June until early September. The height varies according to the moisture content of the soil; on the drier alluvial sand only 18 in., on the moister clay 24–30 in. The plant does dislike a dry plot.

I would grow *Sedum spectabile* ‘Meteor’ and the *S. telephium* X ‘Autumn Joy’ just to sit and watch the butterflies which cluster on the flowers in September. The autumn brings a keener sense of enjoyment to the gardener, the sunlight brings out subtle tones of colour which are not apparent in the height of summer. *S. spectabile* ‘Meteor’ has glaucous-green fleshy leaves which make a perfect back cloth to the deep pink flowers which rise above them on 12 in. stems. *Sedum* ‘Autumn Joy’ is taller and tends to outgrow the strength of the stems in a wet season, up to 24 in. in height, but the beautiful salmon pink flowers which take on a warm glowing russet with age, are beyond price as September gives way to October.

Paeonies are too numerous to mention in detail. My favourite is the earliest to flower, and though the beauty is fleeting the grey-green leaves are in themselves ornamental. *P. mlokosewitschi* flowers in late May, each pale yellow bloom single and well-formed on 18 in. stems. Each year I raise more plants from seed, and one which flowered last year was a stronger, deeper yellow.

In any garden with a reasonable selection of plants it is easy to start writing, but extremely difficult to stop. Over the years plants become invested with personalities, and are looked for as old friends whose presence would be sorely missed. Those mentioned are only a few from those which grow here at Harlow Car. I have not space to mention more, but hope readers will forgive me even though I am certain the plants will not.

# HARDY FERN VARIETIES

by J. W. DYCE

*Hon. Secretary of the British Pteridological Society.*

The British ferns have contributed a multitude of worthwhile plants for the garden yet they are sadly neglected, and ferns seen in gardens are mostly the normal wild forms. I am not decrying the British fern species which are all lovely plants and play a large part in beautifying the countryside, but these plants have given us a wealth of varieties, some of them the most entrancing plants. I make no apology for stating at the outset that very few of the best of these can be obtained commercially, and are to be found only in private collections. It is a sad fact that the well-known collectors of a generation ago neglected to take proper precautions to ensure the safety of the many unique plants entrusted to their care, with the result that today we are left with only a remnant of the fern riches amassed during the latter half of the last century. It is worth while going to some trouble to build up interesting collections and to acquire plants which are not listed in trade catalogues. All the good varieties mentioned below can be obtained commercially.

Without doubt some of the finest hardy ferns in cultivation derive from our native species, *Polystichum aculeatum* and *P. setiferum*, the shield ferns. The latter in particular has been more than generous in the number and beauty of its variations, and some can be acquired easily from commercial growers. Among these I would mention *P. setiferum acutilobum*, a section with divided pinnules, the divisions narrow and sharply pointed, giving the plants a lightness and grace which delights the eye. In the past there was a host of named specimens but they are all very much alike, and it is possible that some are still grown today although the names are lost. The *acutilobe* section with very few exceptions is prolific, and some specimens have a most remarkable growth of bulbils up the main stems, in some cases even extending along the stems of the pinnae. A further development of the acutilobe character is the *P. setiferum divisilobum* section with the pinnules more fully developed and splitting up into a mass of fine segments, and in the *P. setiferum plumoso-divisilobum* types this pinnule development and division has been carried even further with pinnae and pinnules overlapping to give the fronds the appearance of great plumes. Again a great number of named varieties has been lost to cultivation, but under the section names given above all these *Polystichums* can be obtained from at least one or two nurseries, as well as *P. aculeatum pulcherrimum* Bevis, a most remarkable and unique wild find of about 90 years ago. This fern has the dark green glossy appearance of the parent species but the pinnules are more acute, and both they and the pinnae are sickle-shaped and incurving to give a fine delicate imbricate appearance to the fronds and pinnae tips.

Among the ferns which it will be most difficult to acquire commercially are the progeny of the last-named fern. It can be considered a barren form, but on very rare occasions a few spore heaps have been found, and some of



*Thelypteris phegopteris*, the beech fern is a native plant, found growing among shaded rocks and in dampish woods in Scotland, Wales and parts of northern England.

Photo. J. W. Dyce.

the resultant plants are the most astonishing ferns ever produced. Known as *P. aculeatum gracillimum* (progeny of Bevis), many of them are to be found in private collections, and can best be described in the words of C. T. Druery, a most prolific writer on ferns in the early years of this century and the first editor of the *British Fern Gazette*,—"Several are of wonderful delicacy of cutting, the parental half-inch pinnules being extended sometimes to nearly 3 inches and of almost hairlike tenuity with splayed tassel-like terminals, imparting by their weight a peculiarly beautiful pendulous character to the fronds". Such a description implies tenderness, and the finest of the section certainly cannot stand up to outdoor conditions. Some of the not so finely developed specimens are quite hardy like the parent, and I have one in the garden which comes through the most severe winter unscathed, retaining its lovely fronds, still fresh and green, well into the spring.

One other species vies with the shield ferns in the multiplicity of its varieties, *Athyrium filix-femina*, the lady fern. The most common variation is cresting, both of the apices and the tips of the pinnae, and in certain parts of the country, particularly in the Lake District, such kinds are quite common in the wild. In my opinion the soft graceful lines of the lady fern fronds do not lend themselves too kindly to the heavy adornment of large crests, and as with the shield ferns the best varieties are those with further development and division of the pinnules. Many very fine forms have been bred in this section, well-named *plumosum*, and some obtainable commercially are well-worth acquiring. Still further breeding has developed the *A. filix-femina cristatum* and *percristatum*, and all such plants are exquisite in the soft delicacy of their finely divided fronds. One remarkable lady fern, a wild find of over

100 years ago, is still with us growing as strongly as ever, along with its progeny which come true from spores. This is *A. filix-femina victoriae*, with narrow tasselled pinnae growing in pairs at right-angles to each other, forming a lattice up each side of the main stem.

The male ferns, or buckler ferns, have also given many varieties. These are stronger growing and their upright habit makes them ideal for the back of the fern border. They have not the soft gracefulness of the shield and lady ferns, and in strong contrast to them, pinnule division is practically unknown, variation taking the form of cresting, both of the frond apices and the pinnae tips. This family with its hard vigorous appearance can carry this kind of abnormality very successfully, and some of the varieties are very handsome. Among the many outstanding ones obtainable are *Dryopteris borrieri cristata*, known as the King of the male ferns, a large symmetrically crested form, *D. borrieri grandiceps* Askew, heavily tasselled with large terminal crests, *D. filix-mas grandiceps* Willd with neatly crested fronds terminating in large branching crests, *D. filix-mas incisum*, strong-growing with deeply cut pinnules, branching crests, *D. filix-mas inisum*, strong-growing with deeply cut pinnules, and *D. filix-mas polydactyla* Dadds, bold and beautifully crested. Some smaller kinds with crisped and congested pinnules, in addition to cresting, are listed and a very fine one is *D. filix-mas crispa-cristata*. One species must be mentioned, *D. aemula*—it has no varieties and needs none, for this beautiful fern with its triangular parsley-like crisped fronds about a foot high, is one of our most lovely but more uncommon native ferns, and never fails to excite me with its beauty whenever I see it in the wild.

Other species merit attention in their own right as worth-while acquisitions for the garden. *Blechnum spicant*, the hard fern, is an evergreen, and a lime-hater, with once-divided fronds of two kinds, the barren ones growing outwards and drooping, and the fertile ones darker in colour, standing stiffly upright. There are, or were, some good varieties with divided pinnae, but I doubt if any can be obtained now. *Osmunda regalis*, the royal fern, our largest fern and truly royal, will make a large and impressive clump in some damp spot where it can show to advantage; it likes to have its feet in water, so the bank of a pond or stream is the ideal place. The one variety, *cristata*, probably not so strong-growing as the species, has crested pinnae and pinnules. Two very fine small species, *Thelypteris phegopteris*, the beech fern, and *Gymnocarpium dryopteris*, the oak fern, must not be overlooked. These creeping ferns make delightful plants for the front of the border, particularly on a slope or among open stone-work. The oak fern has one variety, *plumosum*, which when well grown is a most desirable treasure.

*Phyllitis scolopendrium*, the hartstongue fern, is another species which has been generous in the giving of varieties. The best are undoubtedly the *crispums*, a section in which the long strap fronds are densely frilled, reminiscent of the Elizabethan neck ruffles, some in addition being deeply cut and/or beautifully fimbriated or fringed. Some good crested forms of the hartstongue fern, *cristatum*, can be got, and indeed this variation is fairly common in the wild but apt to be rather inconstant. A good *cristatum* can be collected, planted in the garden, and the following year it will develop quite normally without a trace of cresting; on the other hand one may be lucky enough to find a good constant variety.



*Osmunda regalis cristata*, the crested royal fern is covered with dense and downy hairs when young which fall off leaving the frond perfectly smooth.

Photo. J. W. Dyce.

Finally, *Polypodium vulgare*, another creeping fern, has produced some fine varieties with the narrow fronds greatly widened by development of the pinnae, which are long and wide and divided into many overlapping segments. There are many forms of this variation but only one that can be easily obtained, *P. vulgare cambricum*, with six to nine-inch fronds making it a fine plant for edging the border or for growing in stone-work.

For the benefit of many who may not keep up-to-date with, and are probably exasperated by, the changing of plant names, it should be said that fern nomenclature has altered a lot, and the names used in this article are the up-to-date ones. However, as most catalogues continue to use the older ones, a list of the changes affecting the ferns mentioned may not come amiss.

<i>Dryopteris</i>	formerly	<i>Lastrea</i>
<i>Dryopteris aemula</i>	„	<i>Lastrea aemula</i>
<i>Dryopteris borrieri</i>	„	{ <i>Lastrea paleacea</i>
		{ <i>Lastrea pseudo-mas</i>
<i>Gymnocarpium dryopteris</i>	„	{ <i>Dryopteris linnaeana</i>
		{ <i>Polypodium dryopteris</i>
		{ <i>Thelypteris dryopteris</i>
<i>Phyllitis scolopendrium</i>	„	<i>Scolopendrium vulgare</i>
<i>Polystichum setiferum</i>	„	<i>Polystichum angulare</i>
<i>Thelypteris phegopteris</i>	„	<i>Polypodium phegopteris</i>

# A REASSESSMENT OF THE WILLOW-HERBS

by A. P. HAMILTON and V. THAKUR

*Department of Botany, University of Durham*

The family *Onagraceae* contains many genera that have provided great beauty for our gardens. *Fuchsia*, *Oenothera*, *Godetia* and *Clarkia* are probably the best known. One genus, however, has provided almost nothing but trouble. This is, of course, *Epilobium*, the willow-herbs.

*Epilobium* is a fairly large genus containing about 160 species that are native of the temperate and arctic-alpine regions of both hemispheres. It exhibits a wide morphological range and many species are of considerable beauty. However, attempts to turn the willow-herbs into respectable garden plants have always failed. In the case of one species in particular, *E. nerterioides* A. Cunn., the attempts were disastrous. Because of its minute size (about 3 in. tall when flowering) and its dainty white flowers that contrast against the reddish-bronze foliage and stems, this little New Zealander has value in the rock-garden. It also has a very effective reproductive capacity! First recorded in the wild in 1904 by the Firth of Forth it now occurs in at least 300 localities throughout the British Isles, ranging from the Orkneys to Land's End and from Co. Kerry to Essex. A similar story of rapid spread can be told about the rosebay willow-herb or fireweed, *E. angustifolium* L., which conquered much new territory with the aid of the railways.

It is perhaps superfluous to say that the seeds of *Epilobium* are wind-dispersed. Probably every gardener, at one time or another, has had the problem of trying to cope with weeding out the willow-herbs before their long capsules dehisce, releasing clouds of fluffy seeds to the four winds. A very effective means of dispersal it is too, for not only does it ensure that the seeds blow to every part of the garden where they readily germinate, but they will also happily grow on walls and in gutters where they can rain seeds onto the luckless gardener below!

But there is another side to the coin. Many *Epilobium* species are of undoubted beauty and have found a welcome place in gardens—for a while. Of our eleven native species, two have horticultural potential and have been grown in the herbaceous border. One of these has the delightful name of the great hairy willow-herb, *E. hirsutum* L. Another name for it is codlins-and-cream, because the fragrance of the flowers is said to smell like stewed codlin apples, and the name apple pie can be found for it in some parts of the country. The "cream" presumably refers to the colour of the stigma. *E. hirsutum* grows by streamsides and in damp meadows and is common throughout most of the country except Scotland and the north-east. This species, with its long stems reaching five or six feet high and bearing purplish-rose flowers, is certainly suitable for damp spots in the wild garden.

*E. angustifolium* is obviously the other candidate for horticulture and it has deliberately been introduced into gardens many times especially around the turn of the century when a white was also grown.

In the 1930's renewed interest in the rosebay willow-herb arose and once more attempts to turn a beautiful wild flower into a garden plant were made. In 1934 and 1939 the R.H.S. gave Awards of Merit to two cultivars of this species. However, while their beauty was not questioned, their habits were, and these plants have been discontinued in commerce for some time now.

Of the 150 or so other species that are found outside the British Isles several have been grown by rock-gardeners. For instance, *E. fleischeri* Hochst., from the European Alps, *E. glabellum* Forst., from New Zealand and *E. obcordatum* A. Gray, from the mountains of Oregon and California.

Can anything be done to reduce or eliminate the phenomenal ability of *Epilobium* to colonize disturbed and bare ground? It now appears that it can—by hybridization. The willow-herbs hybridize freely, but generally only with those species in their own division of the genus. These hybrids are currently popular for research, primarily because they exhibit the curious phenomenon of cytoplasmic inheritance. During recent work on these hybrids at the University of Durham, one of us (V.T.) crossed *E. hirsutum* as the maternal parent with a dwarf yellow-flowered species from North America, *E. luteum* Pursh., that occurs over a wide area from Alaska to the Cascade Mountains in Oregon. This cross had been made many years earlier by Dr. P. Michaelis of the Max Planck Institute and the results were published in 1933. However, no notice appears to have been taken of the horticultural possibilities of the  $F_1$  hybrids and also the back-crosses that were made.

The first generation hybrids can be separated into two types. First, there are the extreme dwarfs that grow only to one or two inches high and are barely viable. The second group are those that normally grow 8 or 9 in. tall. It is this latter group that has provided some extremely decorative plants. These taller hybrids are virtually identical in appearance and are characterized by possessing vegetative characters generally like *E. hirsutum* except for the greatly diminished height. The flowers, on the other hand are morphologically closer to *E. luteum*, but in their colouring they have developed a shade that is unique. It is a dark purple that the R.H.S. Colour Chart describes as doge purple (732)—i.e. the colour of *Primula* 'Wanda', which is made even more striking by a long, pure white cruciform stigma that protrudes well out of the flower even up to two days before the flower completely opens. The flowers are larger than *E. hirsutum* and are borne in pairs; the first partner opening about a day ahead of the second. Like most of the willow-herbs these  $F_1$ s show closing movements of the flower in the evening. A noticeable improvement is in their perfume which is stronger and sweeter than in *E. hirsutum*. These plants seem to have all the advantages of both parental species and some of their own. However, the most useful character is their high infertility. Indeed, if self-pollinated their seed production is virtually nil; they are virtually self-sterile. The capsules simply turn a golden colour and drop off. This, of course, eliminates the main reason for the unpopularity of willow-herbs as garden plants.

It was felt that further crosses should be made with these two species, this time with the aim of producing worthwhile garden plants only. Back-crosses have been made, but those produced from *E. luteum* have all been unsatisfactory. The usual results are that the buds drop off and the plant never flowers. Some seedlings in this cross do flower, if it can be called flowering, and produce everything except petals! This behaviour Michaelis attributes to an unsatisfactory reaction between the different cell components contributed by the parents. For a detailed account of this phenomenon readers will find E. Caspari's paper helpful. Ironically, these apetalous plants are the most strongly-scented so far produced!

When the *E. hirsutum* X *E. luteum* hybrids were back-crossed with *E. hirsutum* a good range of segregates resulted covering various shades of pink and purple, and differing degrees of floral production and size of flower. Perhaps it should be stated at this juncture that all the crosses mentioned in this article are arranged in the order of the maternal parent first. One of the seedlings from the back-cross with *E. hirsutum* is quite exceptional. Essentially it is similar to the best of the F<sub>1</sub> hybrids but the colour is definitely more intense and the bud colouring is well within the range of colour described by most gardeners as "black". The white throat, that in the F<sub>1</sub>s is hardly noticeable, has increased to such an extent that it almost is the most striking feature. However, the character that puts this plant in a class of its own is the size of the flowers which average 1½ in. in diameter. This is partly accounted for by the flowers being flat rather than the open bell-shape of the F<sub>1</sub> plants. Another pleasant feature is the light covering of white "fur", a perfect foil to the dark purple flowers. Altogether there is a formidable set of desirable characteristics in one plant.

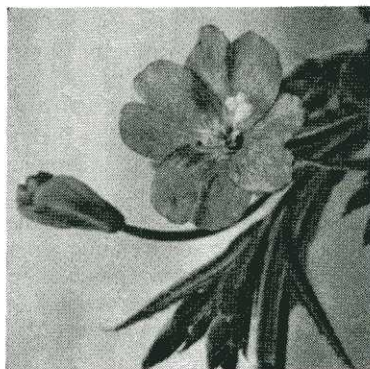
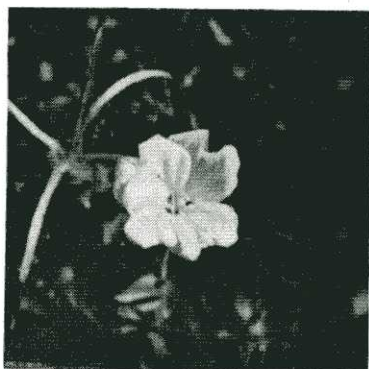
Looking through the seedling boxes this season two other crosses seem to offer possibilities for the rock-garden. One is derived from *E. lanceolatum* Sebastiani and Mauri, pollinated by *E. luteum*. Their seedlings carry attractive white hanging bell-shaped flowers and look more like *Linnaea borealis* L. than an *Epilobium*. They are very dwarf and reach to only 4 in. The other cross, *E. hirsutum* X *E. parviflorum* Schreber., is very decorative if one looks down on it, for it holds all its flowers up to the sky. The flowers are a clear pink and rather over ¼ in. in diameter. Perhaps their best feature is that their leaves are so covered in down that they appear grey-green and this acts as a perfect background to the bright pink flowers. The 6 in. plants that are completely regular in their appearance have obvious possibilities for the creation of uniform carpets of colour in the rock-garden.

A very considerable number of new crosses has been made during the 1966 season and if the new seedlings are as interesting as those so far raised there will be few dull moments next flowering season.

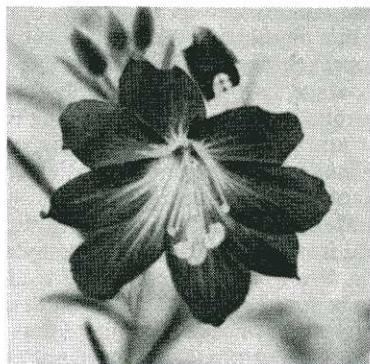
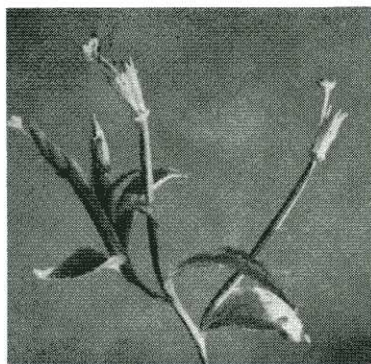
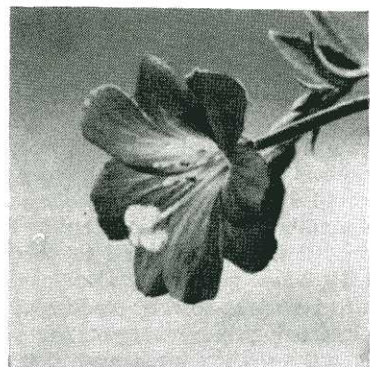
A few notes can be added here on the cultivation of these hybrids. We find they give their best performance in poor soil as they will produce excessive leaf in good garden conditions. In the alpine house best results are obtained when the plant is pot-bound. The ideal situation is certainly the rock-garden and the rockier the better. In the case of the very dwarf ones good places are the edge of paths and crazy-paving where they can run wild. The larger hybrids obviously have "filler" potential in the margins of borders that are



## *Epilobium species and their hybrids*



*Above left, E. luteum and, right, E. hirsutum the original parent plants. Right the F<sub>1</sub> Hybrid, which was then used as a parent plant giving results as shown below. Left, F<sub>1</sub> X E. luteum and, right, F<sub>1</sub> X E. hirsutum.*



disturbed infrequently, but more especially in shrubberies where shearing at appropriate moments will not only ensure an increase in floral production but also a dense canopy of shoots that will help to suppress weeds. One of their most attractive features is that, as they gradually exhaust the soil, so the ratio of flower production to leaves improves; a feature also shown by many *Tropaeolum* hybrids, the garden nasturtiums. Surely, these *Epilobium* hybrids are the ideal lazy-gardener's plant.

The new willow-herbs, like their parents, begin flowering in the second half of June, reach their peak in July and finish in August. They are readily propagated by stolons.

Since we published our first note on these plants Mrs. Sanecki has drawn our attention to some similar work that was done by H. C. Pugsley on the section *Chamaenerion* Tausch., the rosebay willow-herbs. Two species were used by Pugsley in his crosses (*E. angustifolium* and *E. latifolium* L.) and his interesting results were subsequently published in the BULLETIN of the Hardy Plant Society.

From his article it is clear that we were not the first to think of making willow-herbs acceptable garden plants by sterilizing them. However, while both Pugsley and ourselves had the same aim we have used different methods. Pugsley hoped that by crossing *E. latifolium* whose chromosome number is listed as  $2n=72$  with *E. angustifolium*,  $2n=36$ , the resulting triploids with number  $2n=54$  would be sterile because of the chromosomal imbalance at pollen and ovule formation. However, the plant of *E. latifolium* that was counted came from Iceland and appears to have been atypical as the chromosome numbers of all the other European *Epilobium* species that have been counted are all  $2n=36$ . The *E. latifolium* used by Pugsley came from the Rocky Mountains from seed collected by Will Ingwersen. When the  $F_1$  hybrids were counted they were found to be the usual  $2n=36$ . This suggests that the *E. latifolium* parent was also  $2n=36$ . A further point is that, in contrast to our plants, the rosebay seedlings were fertile. This result of Pugsley's work is interesting since it suggests that species in the section *Chamaenerion* do not show the sterility mechanism that we have encountered in our species that come from the section *Epilobium* (=Sect. *Lysimachion* Tausch.). It was, of course, this mechanism that we used for sterilizing our plants; a mechanism that is not based on imbalance of chromosome numbers but rather on some subtle physiology. We feel that our method has some advantage over Pugsley's approach because it does not close the door to further hybridisation at the  $F_1$  stage, as triploidy normally does. The presence of some residual fertility enables one to continue breeding for many generations. At the present state of knowledge it seems perfectly possible to keep adding to the hybrids *ad infinitum*. The range of variation that this should produce ought to provide plants for every taste.

Many thousands of willow-herbs have been raised at Durham since 1963 and it is clear that most of the hybrids of *Epilobium* species are highly infertile. We would suggest that if readers are tempted to hybridize the willow-herbs for themselves, they should note carefully just how sterile their seedlings are. Michaelis has found that some strains have quite a high degree of fertility. Fortunately we have not encountered these in the plants mentioned,

but it cannot be emphasized too strongly that if very fertile seedlings are produced it would be best to destroy them before they spread like wildfire. Pugsley's results could be explained by assuming he used fertile strains but more work is needed on the rosebays before firm statements can be made. A series of crosses has been carried out on them at Durham this season. It can be added here that all crosses between section *Chamaenerion* and the other willow-herbs have failed; a result which supports the existing taxonomic divisions of the genus.

This preliminary analysis that we make of the Durham work on *Epilobium* hybrids does suggest that willow-herbs, in general, can be tamed and made to produce worthwhile garden plants.

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*Reprints of the article are available from Dr. A. P. Hamilton, University of Durham.*



# HARDY HERBACEOUS PLANTS FOR TUBS AND CONTAINERS

LANNING ROPER

*Gardening Correspondent of The Sunday Times.*

As the size of the majority of gardens becomes increasingly restricted and life centres more and more around the terraces and paved living areas near the house, the desirability of containers for plants cannot be minimized. The overworked word "patio" is applied to these areas and includes courtyards, terraces and any semi-enclosed living space. The usual bulbs, wallflowers, hydrangeas, fuchsias and geraniums are excellent but all too familiar, and I have been experimenting with hardy plants that will give a good, lasting effect.

Obviously containers, whether wooden tubs or large flower pots of clay, stone, lead or composition, must be sufficiently large for ample root growth although there are plants such as hardy agapanthus ('Headbourne Hybrids') that flower well when pot-bound. Good drainage, a suitable compost, regular watering and feeding are all essential. It pays to take every precaution in preparation for planting. Do not skimp on good compost because of cost when filling the containers as on this success will depend in large measure.

The varieties of hardy plants to be used are my chief concern. *Bergenia*s come high on the list; for some reason these are used far more widely in France than here. The large heavy-textured leaves and the panicles of flowers are decorative both winter and summer. As *bergenias* are surface-rooting, they are particularly suitable for shallower pots than some others that I shall suggest. Good varieties include *B. cordifolia*, *stracheyi*, *ligulata* and *crassifolia*. I would avoid the hybrid 'Delbees' as the foliage is too large save for very large containers. *Bergenia*s are suitable for sun or shade and will in a year or two start to drape the sides of the pot.

Second on my list are the many hostas, unbeatable as foliage plants and ideal for the many shaded places. As they have a heavy root system, they want plenty of depth and lots of feeding. Copious watering is also essential as they are moisture-loving. In France and Italy the white-flowered *H. plantaginea* is widely grown; it is well worth trying in sheltered warm positions as it needs a long growing season to insure a bounty of the very large fragrant flowers in early autumn. Hostas should have plenty of humus such as leaf mould or granulated peat in the compost.

For large wooden tubs varieties of *Anchusa azurea* are very effective. They have long tap roots so do not grow them unless the tubs are deep. They will provide clouds of blue for many weeks, and, if cut back after flowering,

a secondary flush often follows. Use compact growing varieties such as 'Loddon Royalist' and 'Pride of Dover'. A sunny position is best and plants will have to be renewed every few years. If the tubs can be given some shelter in winter and kept fairly dry, the life of the plants will be prolonged. Bees and butterflies love anchusas and tubs of them on a sunny terrace near the house will give added pleasure. Tubs of regale lilies are lovely with the blue of the anchusas.

I am experimenting with hemerocallis in tubs as the graceful habit of the foliage is particularly pleasant and the flowers come at such a useful season in mid-summer. Moreover, the leaves appear so early in the year and are of such a vivid light green that they are already decorative at a time when so many other plants are still resting below ground. They are vigorous with a generous root system so depth of soil is again essential. They grow well in sun or semi-shade. Colours vary from cool greenish yellows, clear golds and pinks to reds, orange and scarlets.

The various mints are successful in tubs or pots which contain the rampant spreading stoloniferous roots. Cultivars such as *Mentha rotundifolia* 'Variegata', the sweetly scented variegated apple mint, is striking if planted in a black Verine or lead container and I have a weakness for the eau de Cologne mint (*M. citrata*).

A friend has established, very successfully, large clumps of acanthus, *A. spinosus* and *mollis* in concrete containers. These are beautiful in summer when the handsome lustrous dark green foliage arches over the sides and the sturdy flower spikes thrust up above them. Root stocks are in time formidable so deep soil, plenty of room and strong pots are essentials. Acanthus will grow in either sun or shade.

London pride (*Saxifraga umbrosa* x *spathulazis*), *Lamium maculatum*, *Vinca minor* and the silvery grey *Cerastium tomentosum* are effective to cover the sides of pots and tubs or as a low ground cover for tubs of lilies or with bulbs in spring coming through them.

One of my great successes is a simple black Verine tub planted with the striking white and green grass *Phalaris arundinacea* 'Picta', charmingly known as ribbon grass or gardener's garters. I like the bold pattern of its long narrow blades and the confinement of a tub suits it. In open ground phalaris can take over large areas all too quickly. In a tub it will not grow quite as tall as it does in the open ground.

There are so many other plants that I would like to mention but space prevents. Although the bleeding heart (*Dicentra spectabilis*) may die to the ground in mid-summer, the long arching stems of glaucous fern-like leaves hung with pink and white heart-shaped lockets are so beautiful in pots or tubs, that you should try to have one or two, even if it means replacing it with a pot of fuchsias or geraniums for summer.



# NOTES FROM THE PEN OF DAVID WHITE

*Helleborus niger*. This plant is best grown in a semi-shaded position where the ground is not too heavy and leaf mould and compost have been incorporated at planting time. An annual top dressing of peat is helpful.

Saving one's own seed, and taking not more than two pods from each plant is the most rewarding method of propagation. I have had flowers the first season after planting, but it is not usual. Sow the seed as soon as the pods are ripe in June in pans of John Innes No. 1 compost, spacing them out. After watering leave them in the open but cover them with a sheet of glass during the winter. The seeds will germinate in six months and when they have made two or three leaves plant them out where they are to remain, and see that they do not dry out in summer. Do not pot the seedlings. Seeds sown in a seed pan in June 1963 gave me much delight during February 1966

The cultivar, 'Potter's Wheel', is the largest I know. *H. orientalis* should be given much more room than *H. niger* as it makes enormous foliage, and the various colours of the flowers are attractive. The stems of either hellebore should be slit a little when put in water and placed in a cool room if they are to last long. *H. corsicus* with its jade green flowers can also be raised from seed and given the same treatment as *H. niger*.

*Iris japonica* (syn. *fimbriata*) requires quite different treatment from *I. germanica*. Full sun is best and the rhizomes should be planted deeply because they are apt to work themselves out of the ground. An annual top dressing of sifted loam is useful. The flowers are beautiful and can almost be mistaken for an orchid. The plant should be divided every second or third year after flowering. Like most good plants, they will flower for a considerable time among their vivid green leaves, if the dead heads are removed.

*Agapanthus mooreanus*. This plant is absolutely hardy and deciduous, even the severe winter of 1962-63 left it unaffected. It can be raised from seed sown in the spring and in 2-3 years time will flower. It should be kept in pots in the first season and then planted out in rich soil. *A.m. minimus* is a gem and also perfectly hardy. Other hardy species are *A. inapertus*, with drooping blue flowers and *A. africanus albus* with white flowers. Both are deciduous.

*Punica granatum*. The common pomegranate is quite hardy. My own plant was raised from the seed of a fruit and has survived several winters. It is deciduous and the fresh green foliage is refreshing in summer.

*Romneya coulteri*. This wonderful poppy-like plant is best near a wall and should be left undisturbed. It should never be cut back until the new growth is well developed in the spring. In severe winters a little protection is advisable.

*Ceratostigma willmottianum*. This is a wonderful spreading plant and gives sky blue flowers. The dwarf species *C. plumbaginoides* is useful in crazy paving where the azure flowers give a delightful display until the late summer when the leaves often turn red at the same time.

*Epimedium pinnatum colchicum* (syn. *elegans*). This is a most useful dwarf plant, providing cover and bearing dainty, yellow flowers and almost ever-green foliage which, when withered in severe winters, should be cut back to the crown and will develop quickly again, in the spring.

*Iris sibirica*. Here is a deciduous iris of easy culture with blue flowers. A cultivar 'Caesar' has dark violet flowers and another, 'Snow Queen' is white.

*Libertia formosa* is a handsome plant with iris-like foliage and ought to be better known. The white flowers are most attractive and if the seed is sown as soon as it is ripe the resultant seedlings will flower in 2-3 years' time. Always plant firmly and in semi-shade. Propagation is by division.

*Schizostylis coccinea* likes a sunny position and the most rewarding form is 'Mrs. Hegarty'. It increases quickly and in a good autumn like 1965 there will be a spike of the pink crocus-like small flowers to cut from September to November. They last well in water and the buds continue to open. These rhizomatous plants are best divided in the spring every second or third year.

*Sisyrinchium striatum*. Another iris-like plant which has its leaves in the shape of a fan and yellow flowers in profusion all up the stem. Do not plant it in a windy position because it is shallow rooted and the plants will easily blow over. It is very effective in shady corners.

*Liriope*. Both the green and the striped cultivars of *liriope* are perfectly hardy. The stiff spike of flowers is handsome but useless for cutting. In a narrow border they are useful, requiring little attention, and seldom need division.

*Campanula isophylla*. The blue and white cultivars of this plant are perfectly hardy, yet strange to say, as a rule it is confined to the greenhouse and used to graceful effect for hanging baskets.

*Campanula lactiflora*. An excellent plant both for the herbaceous border or the wild garden. Its long stems and milky blue flowers although somewhat variable in colour are best in the form *celtidifolia*; but if the plants are allowed to seed themselves some variation in colour is achieved.



The Editor wishes to thank all members who write with suggestions and ideas for the BULLETIN, and would like to hear from more members overseas. She also acknowledges much help and advice from several members in the preparation of the BULLETINS.

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