

Tuesday Morning Session, December 6, 1977

The Tuesday morning session convened at 8:30 a.m. with Dr. Everett Emino serving as moderator.

EVERGREEN HERBACEOUS PERENNIALS

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The majority of cultivated herbaceous perennials are characterized by foliage and stems which die to the ground at the end of the growing season. However there are some species of herbaceous perennials with evergreen foliage. Such plants, representing many different plant families, are found in many of the world's temperate floras. Generally they have creeping underground rhizomes, stolons or somewhat enlarged rootstocks which provide a source of water and food storage during the winter. Many of the small, low-growing genera such as *Cop-tis*, *Mitchella*, and *Pyrola* are found in northern latitudes where the snow cover affords winter protection for the evergreen leaves.

Evergreen herbaceous perennials lack secondary stem tissue and thus can be distinguished from suffruticose evergreen perennials such as *Epigaea repens* and *Daphne cneorum* which have persistent woody stems. Several other well-known evergreen perennials are classed as subshrubs, or suffrutescent perennials, whose stems are woody at the base. This group includes *Iberis sempervirens*, *Pachysandra terminalis*, *Potentilla tridentata*, and *Vinca minor*.

Since with only a few exceptions, all of the evergreen herbaceous perennials are propagated by division it seemed appropriate to discuss them in groups according to landscape use or growth habit. All of the plants discussed are cold-hardy outdoors through Plant Hardiness Zone 7.

PLANTS OF MAJOR LANDSCAPE VALUE

Asarum (Aristolochiaceae) — the evergreen species of wild ginger are excellent plants for use in shady areas. Some species such as *A. europaeum* are satisfactory groundcovers spreading rather rapidly, while others such as *A. shuttleworthii* remain in discrete clumps. *A. arifolium*, *A. shuttleworthii*, and *A. virginicum* — all native to the southwest U.S. — have variable often strikingly mottled leaves. There are also many ornamental

Japanese species, varieties and cultivars which are not cultivated in this country and deserve to be better known. All are readily propagated by division of the rhizome. Self-sown seedlings are sometimes found around established plantings. Seed usually takes 2 years to germinate.

Bergenia (Saxifragaceae) — *Bergenias* have long been valued for their handsome large leathery leaves and their ability to grow in dry shaded areas. Although *B. ciliata* has densely hairy leaves, the other species commonly cultivated such as *B. cordifolia*, *B. crassifolia*, and *B. × schmidtii* have glabrous foliage. Cultivars developed in Europe with very showy red, pink or white flowers included 'Ballawley', 'Evening Glow', and 'Silver Light'. All are propagated by division of the thick rhizome or by seed, although some *Bergenias* do not flower freely and seldom produce seed.

Festuca ovina var. *glauca* (Gramineae) — the Blue fescue is a distinctive landscape plant because of its fine-textured blue-gray leaves produced in neat mounds. It is easily propagated by division of the crown or by separation of the basal offsets.

Helebores (Ranunculaceae) — the hellebores are noted for their large compound leaves and for their flowers in late winter to early spring. The commonly grown species are *H. niger*, the Christmas rose, and *H. orientalis*, the lenten rose. The former has white to pinkish flowers while the latter has greenish to purple or creamy flowers. Other evergreen species worthy of cultivation include *H. foetidus* and *H. lividus* subsp. *corsicus*, both of which grow to 2 feet. All have a thick rootstock which may be divided in the autumn with care in handling the very brittle roots. The most effective method of increase is from seed sown after 6 weeks of stratification. Established plantings of *H. orientalis* will freely self-sow in shaded moist sites, producing an interesting array of flower colors.

Liriope (Liliaceae) — *Liriope* and *Ophiopogon* are often difficult to distinguish unless flowers are present. *Ophiopogon* has drooping flowers in short arching racemes while *Liriope* has sessile erect flowers on upright spikes. *L. muscari* has showy purple flowers in September and deep somewhat tuberous roots. As the plants remain in distinct clumps they are often used as edging material. 'Variegata' and 'Monroe White' are excellent cultivars. *L. spicata* which spreads rapidly by stolons is widely used in the southern US. as a groundcover. Some of its roots are swollen and the flowers are often hidden by the foliage. Since all Lilyturfs are easily propagated by division, seed is rarely used.

Ophiopogon (Liliaceae) — Often known as mondo-grass, *Ophiopogon* is also widely grown in the southern U.S. as a

groundcover. *O. jaburan* has long grass-like leaves and non-tuberous roots. *O. japonicus*, dwarf mondo, has short leaves, tuberous roots, and spreads by stolons forming a dense mat. *O. planiscapus* includes the distinctive cultivar 'Nigrescens' which has nearly black leaves and also spreads by slender stolons. About 25% of the seedlings of this cultivar will also have the dark leaves. Propagation of all *Ophiopogon* species is easily accomplished by division.

PLANTS OF LESSER LANDSCAPE VALUE

Aspidistra elatior (Liliaceae) — Although best known as an indoor plant this Japanese native will grow outdoors in sheltered sites in Zone 7. It is often used in Japanese gardens as a specimen or in mass plantings in dense shade. Propagation is by division in early spring.

Equisetum hyemale (Equisetaceae) — Common scouring rush has dense clusters of evergreen tubular stems growing 4 or 5 feet which arise from a widely branching rootstock. It has long been valued as an accent plant in Japanese gardens. Because of its unique architectural character, it deserves to be considered for wider use as a specimen plant in moist areas. It is easily propagated by division.

Galax urceolata (Diapensiaceae) — Galax is noted for its glossy foliage which turns bronze-red in the winter. The leaves were formerly collected in large numbers for use in the florist trade. Plants are collected in the mountains of Virginia and North Carolina to Georgia. Here it grows as a woodland groundcover in dense masses from scaly rhizomes. Propagation is ordinarily by division of the matted rootstocks. Seed sown outdoors in the fall will germinate the following spring.

Lamiastrum galeobdolon 'Variegatum' (Labiatae) — Variegated golden archangel is a fast growing groundcover spreading by long prostrate stems which root readily at the nodes. It thrives in shady dry areas. The yellow flowers and silver-mottled leaves which are essentially evergreen through Zone 7 are highly ornamental. It is easily propagated by division, by layers, and by stem cuttings taken during the growing season.

Pachysandra (Buxaceae) — Although the widely cultivated *P. terminalis* is a suffrutescent perennial, two of the four other species are evergreen herbaceous plants. *P. procumbens*, Alleghany pachysandra, has dully mottled leaves and spreads slowly by rhizomes as a groundcover. *P. axillaris*, an Asiatic species seldom cultivated, has somewhat rugose leaves. Both species may be propagated by division or by stem cuttings taken during the growing season.

Rohdea japonica (Liliaceae) — The many cultivars of this plant are highly valued by Japanese collectors for their great diversity of foliage patterns and shapes. The leathery elongated leaves arise from a compressed basal stem. Clusters of red berries add further ornamental interest. Plants have successfully overwintered outdoors in the Washington, D.C. area. Propagation is by division of offsets from established plants or by seed.

Shortia (Diapensiaceae) — Shortias, with their glossy leaves and attractive flowers, are valued as small specimen plants in the woodland garden where they may slowly spread to form colonies. Both our native *S. galacifolia* and the Japanese *S. uniflora* have white flowers, while the Japanese alpine *S. soldanelloides* has pink flowers with fringed corolla lobes. The slender creeping rhizome with clusters of leaves may be divided for propagation. Seed is seldom produced.

Miscellaneous — In addition, a few herbaceous perennials may be considered evergreen, at least during mild winters. Plants such as *Armeria*, some *Sedum* species, and some *Dianthus* species and cultivars would fall into this category.

SMALL NATIVE PLANTS OCCASIONALLY CULTIVATED

Chimaphila (Pyrolaceae) — The common species of pipsissewa in eastern U.S. are *C. maculata* with gray-mottled leaves and *C. umbellata* with lustrous bright green leaves. Short stems arise from slender creeping underground rhizomes. The rhizome may be divided into sections, each with a stem and leaves. Plants are difficult to cultivate however, perhaps because of a mycorrhizal requirement.

Coptis (Ranunculaceae) — The goldthreads have small dark glossy leaves arising from a slender yellow rhizome. *C. groenlandica* is hardy in Zone 2. It may be propagated by seed sown in the fall, or by division of the rhizome into sections with a stem and leaves. *C. trifolia* seed will germinate readily in a moist medium.

Goodyera (Orchidaceae) — Rattlesnake-plantains are sometimes used in terrariums or cultivated in the wildflower garden for their rosettes of attractive white-veined evergreen leaves. They grow from creeping rhizomes or stolons forming small colonies. The most ornamental species are *G. pubescens*, *G. repens* var. *ophiodes*, and *G. tessellata*. They do not lend themselves readily to asexual propagation, although offsets may be separated or the rhizomes divided. Plants for commerce have usually been collected in the wild.

Lycopodium (Lycopodiaceae) — Clubmosses are spore-bearing evergreen herbs representing about 450 species. Those native to North America are often found in the wild in immense

clonal colonies spreading by rhizomes. Although all are highly ornamental they are rarely cultivated because of the difficulty of successful transplanting due to their mycorrhizal requirements. *L. lucidulum*, shining clubmoss; *L. selago*, fir clubmoss; and *L. selago* var. *patens*, Lloyd's clubmoss, are sometimes cultivated. *L. lucidulum* has been successfully propagated by cuttings in a Nearing frame. These two species also produce gemmae, or plantlets, in the axils of the upper leaves which fall to the ground when fully developed.

Mitchella repens (Rubiaceae) — Partridge-berry is often grown in woodland gardens or in terrariums. Its red berries and small rounded leaves on trailing stems are of great winter interest. It is easily propagated by division of the stems which root at the nodes, or by stem cuttings taken during the summer. Seed take 2 years to germinate.

Pyrola (Pyrolaceae) — Most of the 12 or so species occur both in North America and Asia. They have lustrous rounded leaves arising from a scaly slender and rather brittle rhizome. White to pink flowers are borne on slender spikes well above the foliage. *P. elliptica* (shinleaf), *P. asarifolia*, and *P. rotundifolia* are sometimes transplanted or propagated by division of the rhizomes, but a probable mycorrhizal association precludes widespread success.

HARDY EVERGREEN FERNS (Polypodiaceae)

Although all may be grown from spores, traditionally the common American evergreen species have been collected from the wild to meet commercial demands. *Asplenium platyneuron*, ebony spleenwort, and *A. trichomanes*, maidenhair spleenwort, may be propagated by division of offsets. Spores often germinate readily in moist areas near established plants. Woodferns, *Dryopteris marginalis*, *D. austriaca* var. *intermedia*, and *D. austriaca* var. *spinulosa* may slowly increase to produce up to six crowns at the apex of the thickened rootstocks. These are difficult to divide, however. *Phyllitis scolopendrium*, hart's-tongue fern, eventually forms several crowns or offsets from short upright rootstocks which may be divided. Spores germinate readily in the greenhouse. *Polypodium vulgare*, common polypody, spreads by surface rhizomes which may be easily divided. Christmas fern, *Polystichum acrostichoides*, is probably the best of the evergreen ferns for landscape use. Although it may be found in extensive colonies in the wild, the rootstocks spread very slowly. Established clumps may be lifted and carefully divided in early spring. Other evergreen species include *P. aculeatum*, *P. lonchitis*, and *P. munitum*.

EDITOR'S NOTE: Dr. H.S. Bhella of the Regional Plant Introduction Station at Iowa State University, Ames, Iowa presented a talk on the propagation of eastern white pine, *Pinus strobus* and ribber birch, *Betula nigra*. Papers have already been presented in *The Plant Propagator*, 22(4):8-10 and 23(2):5-7, respectively, and are, therefore, not repeated here.

PROPAGATION OF SELECTED MALUS TAXA FROM SOFTWOOD CUTTINGS

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Abstract. Cuttings of *Malus* × *atrosanguinea*, *M. floribunda*, *M. 'Hopa'*, *M. hupehensis*, *M. 'Selkirk'* and *M. siebodii zumi* var. *calocarpa* were collected at two week intervals from May 14 to August 6, 1976. IBA, NAA or a combination were applied at concentrations of 2500, 10000, 20000 or 30000 ppm as a 5 sec dip. Control was a 50% alcohol solution. Parameters used to evaluate rooting included root number, root length, degree of callus formation and rooting percentage. May and early June cuttings rooted in the highest percentages. The 2500 and 10000 ppm IBA treatments proved most effective. The two highest hormonal concentrations resulted in phytotoxicity. *M. × atrosanguinea*, *M. floribunda*, and *M. × z.* var. *calocarpa* exhibited the best rooting followed by *M. 'Selkirk'*, *M. 'Hopa'* and *M. hupehensis*.

Crabapples are commonly propagated by four methods: root grafting; top working; spring budding with dormant buds; and summer budding (16). Commercially crabapples are usually field-budded in August or benchgrafted during the winter months (6,8,12,13,14,16). However, many problems arise from these two propagation methods. Budding crabapples poses a number of problems. With many cultivars the wood is hard, the bark very thin or the scions very slender. Some crabapples have a hard hump beneath the bud making it difficult to complete a proper cut. Others have a depression beneath the bud so it is difficult to get enough tissue beneath the bud without cutting too much wood above and below the bud. Buds and leaf petioles vary greatly in size, making some very tedious to handle. Also, if budded early in the season some very crabapple cultivars start growth before winter, usually in a horizontal direction. This may produce crooked shanks the following year. Most budded crabapples must be staked from the time they are 12 to 14 inches high, because the stem stiffens rapidly behind the growing tip, long before a union is established at the base. Finally, production costs are very high with budded material (16,17).

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