PARADISI IN SOLE
Paradisus Terrestris.
A Garden of all sorts of pleasant flowers which our English ayre will permit to be nurset in;
A Kitchen garden of all manner of herbs, roots, & fruits for meat or sauce may be with ease and
An Orchard of all sorts of fruit-bearing trees and shrubs fit for our Land together
With the right ordering planting & preserving of them and their fruit & products
Collected by John Gerarde.
Apothecary of London 1597.
A Sourcebook of Cultivar Names

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Cover: An assortment of leaves of Acer palmatum and japonicum as illustrated in the 1901 catalog of the Yokohama Nursery Company. From the Archives of the Arnold Arboretum.

Inside front cover: Frontispiece from John Parkinson's Paradisi in sole paradisus terrestris of 1629.

Inside back cover: Varieties of Iris as illustrated in Paradisi in sole paradisus terrestris.
Various roses as illustrated in Paradisi in sole paradisus terrestris by John Parkinson, 1629.
Preface

The process of selecting and naming cultivated plants is as old as human society itself, and the rise of civilization based on an agrarian society was in large measure dependent on the process. While plants of agricultural significance were the primary focus of attention, plants of strictly ornamental value were certainly not overlooked. Consequently, by 1629 John Parkinson (1567-1650) could author the first book devoted entirely to garden plants, Paradisi in sole paradisus terrestris, and enumerate the many variants that had been selected and perpetuated through propagation and cultivation in gardens. The tradition of documenting and describing cultivars has continued since Parkinson's time and in 1753 took—a long with botanical nomenclature—a new turn with the introduction by Linnaeus of binomial nomenclature. It was at this point that the polynomial or phrase names used to refer to the different types of plants were replaced by a two-word name incorporating a generic name coupled with a specific epithet (for example, Quercus alba, our native white oak).

Subsequent to the time of Linnaeus, the plants intentionally selected by growers for a particular attribute or combination of attributes were accommodated within the botanical system of classification and named using the infraspecific ranks of varietas and forma (e.g., Quercus robur f. fastigiata, now Q. robur 'Fastigiata'). However, because it is these same ranks that botanists use to name naturally occurring variants in the world's spontaneous floras, ambiguity was inevitable. Did a particular varietal or forma name refer to a naturally occurring plant or to one selected for a combination of attributes and perpetuated only in cultivation by skilled propagators and knowledgeable gardeners?

As confusion mounted, it became necessary to establish two separate systems of nomenclature: one for botanists studying forms occurring in nature, and another for horticulturists selecting and naming plants for economic or ornamental value. With the publication in 1953 of the first edition of the International Code of Nomenclature for Cultivated Plants (W. T. Stearn, 1953, London: RHS) the term cultivar, which merged the two words “cultivated variety” into one, was officially introduced to the horticultural world, and the rules governing the naming of cultivars were formally divorced from the rules for naming botanical taxa. Henceforth, plants selected for unique attributes of horticultural importance were to be given so-called “fancy” names in the vernacular (e.g., Magnolia grandiflora 'Tulsa'), whereas botanical epithets at the species and infraspecific ranks would continue to employ names in Latin format (e.g., Magnolia acuminata var. subcordata). Additionally, the new “cultivated code” provided for the designation of national and international registration authorities that would serve as clearing houses for monitoring the use of cultivar names, thus insuring that their formation and application followed the recommendations of the Code.

A further responsibility of registration authorities stipulated by the Code was the development of master checklists of cultivar names. This involved accounting for the
literature pertaining to each group or genus from the time of Philip Miller's *The Gardeners Dictionary* (sixth edition, 1752) onward. The goal was to produce master checklists of cultivar names—in both Latin that predated the "cultivated code" and the vernacular—in order to stabilize cultivar nomenclature and to avoid duplication of names. At the same time, lists of known synonyms and standard references for a given group of cultivated plants would be developed.

Over the years since 1953, a great deal of progress has been made in attempts to achieve these goals, and literally thousands of new cultivars have been named and introduced into the worldwide horticultural marketplace. Locating these published names in the literature and finding descriptions and checklists, however, is often a daunting task for the uninitiated, and tracing elusive cultivar names frequently leads to a dead end.

In providing an up-to-date listing of cultivar checklists and the widely diverse literature in which cultivar names and pertinent descriptions and illustrations can be found, Professor Tucker and his coauthors have provided a great service to horticultural science as well as garden historians and landscape architects involved in historic landscape preservation. This listing, moreover, gives us an indication of where we have been in the past and provides the basis for documentation of future developments in ornamental horticulture. The wealth of information contained in this listing is a particularly welcome summary of work to date inasmuch as a new, fourth edition of the *International Code of Nomenclature for Cultivated Plants* is due to appear later this year. Professor Tucker and his coauthors are to be congratulated for this unique and useful contribution.

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Introduction

Gardeners have traditionally traded plants over the back fence. For many, identification beyond "grandmother's pink rose" is not needed. Others, however, want to know the correct name of the cultivar (a term derived from cultivated variety). Is your old white iris *Iris germanica* 'Alba', or is it really 'Albicans'?

An even more vexing problem is authenticating the identification of purchased plant materials from both mail-order and local nurseries. Nurseries receive plants under one name, often from a commercial grower, and are frequently slow to change. Is your 'Black Magic' iris correctly identified, or is it really 'Eleanor Roosevelt'? Have you purchased *Rosa damascena* 'Trigintipetala' because of its anticipated fragrance and light pink flowers but received instead a hybrid with no damask rose genes, dark pink flowers, and little fragrance? Correct identification of cultivars requires consultation of cultivar checklists and ultimately of period descriptions. This brings up another problem: who has published checklists of your favorite plant group?

Our initial interest in compiling a list of cultivar checklists was generated by work in historical restoration. The task was to locate pre-1900 cultivars of ornamentals and to verify them by cumulative checklists (Kunst and Tucker, 1989). We have since expanded this to an attempt to locate all cultivar checklists for ornamental plants. (Because these lists are often scattered and sometimes difficult to locate, we would appreciate any corrections and updatings.)

In the following, some historical checklists are included, but we have concentrated on the most recent, updated, cumulative ones. Our cut-off date of publication, with few exceptions, is January 1994.

The ideal checklist includes the name of the cultivar, the date of introduction (or registration), the name of the hybridizer, parentage, description, and colored photograph. Of course, this ideal is rarely achieved, especially in the older literature. For this reason, we have also included botanical and horticultural revisions when cultivars are described and illustrated. Good general references to extant cultivars are Harkness and D'Angelo (1986) and Hatch (1986). The Wisley Trials in the *Journal* and *Proceedings of the Royal Horticultural Society* are recommended for cultivar descriptions; Wright (1984) also discusses many cultivars.

designated authorities are further supplemented by cumulative checklists and origination lists maintained and published by specialist societies.

The general starting point for valid publication of cultivar names is the sixth edition of Philip Miller’s *The Gardeners Dictionary* (1752). The rules for naming cultivars are covered by Brickell (1980) and Greuter (1988). The American Association of Nurserymen (c. 1987) and Allan (1988) have published guides for the public.

A recent problem that may confuse efforts to stabilize cultivar names is the substitution of trademarks. The statement by the AAN that “under Federal law, plant variety [cultivar] names may not be trademarked” actually runs counter to the current practice in some large wholesale North American nurseries. For example, many horticulturists know the trademarked name *Ilex* China Girl™ but have never heard of ‘Mesog’, its registered cultivar name. Even the prestigious *Modern Roses 10* (Cairns, 1993) does not list ‘Wilwind’, the cultivar name, but rather Windmill™. What, then, is the real cultivar name?

The Townsend-Purnell Plant Patent Act of 1930 provides a 17-year patent protection for asexually propagated cultivars, and the Plant Variety Protection Act of 1980 provides 18-year legal protection for sexually propagated cultivars in the United States. In order to circumvent this limitation of time, some nurseries have resorted to trademark names (Chadwick, 1988; Darke, 1991, 1992; Dates and Luby, 1988; E. McClintock, personal communication, 1990; Royon, 1986). While this is allowed by the *International Code of Nomenclature for Cultivated Plants* (Brickell, 1980), with this practice different cultivars may be substituted under the same trademark name from year to year. Although we understand the monetary reason for using trademark names, we must chastise the nursery industry for creating a vast confusion in the process, and no solution is envisioned for the immediate future.

Ultimately, after having spent good money for ‘Munstead’ lavender because of its association with Gertrude Jekyll, it is disappointing to consult the checklists and realize that you have really purchased ‘Compacta’. Errant nursery cataloguers will only be corrected by gardeners who insist on correct labelling for their money.

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Checklist of Cultivars

*Abies*  See conifers.

*Acacia*  See Australian & South African plants.


*Achimenes*  See Gesneriaceae.

*Aconitum*  Some of the cultivars of the monkshoods are listed by Lord (1988) and Müssel (1986).

*Adiantum*  See ferns.

*Adonis*  Cultivars of *Adonis amurensis* Regel & Radde are discussed by Nakamura (1964).

*Aeschynanthus*  See Gesneriaceae.


*Agonis*  See Australian & South African plants.

*Agapanthus*  The cultivars of the Nile lilies are discussed in the Wisley Trials of 1977 (Royal Horticultural Society, 1978).

*Aglaonema*  The cultivars of the Chinese evergreens are listed by Jervis (1980).

*Allium*  The few ornamental cultivars of *Allium*, the onions, are listed by Davies (1992).

*Alnus*  Cultivars of the alders are listed by Ashburner (1986) but without introduction dates or background. Grootendorst (1972a) and Schneider (1965a) also discuss the cultivars of alders. An additional registration of *Alnus* is recorded by Huttleton (1988). Cultivars of *Alnus* are also discussed by Bean (1970-1988) and Krüssmann (1984-1986).

*Aloe*  The South African Aloe Breeders Association has circulated an unpublished list of *Aloe* cultivars (for example, 1987), and many cultivars are published in *Aloe* and other South African journals.

*Alsobia*  See Gesneriaceae.

*Alyssum*  The cultivars of the alyssums are discussed by Dudley (1966).

*Amaryllidaceae*  Traub & Hannibal (1960) list the cultivars of *Brinngivia* with later additions published in *Plant Life*. Traub (1961) lists the cultivars of *Crinodonna* with later additions in *Plant Life*. Kelsey & Dayton (1942) and Anonymous (1958f) are the first to list the cultivars of the garden amaryllis, *Hippeastrum*, but the most comprehensive list is by Traub et al. (1964) with subsequent registrations in *Plant Life*. The nerines are listed by Kelsey & Dayton (1942),
the Royal General Bulbgrowers' Association (1991), and Smithers (1993), but the most comprehensive lists are Menninger (1960), Roberts (1984), and Smee (1984) with later additions in editions of Plant Life.


**Anigozanthos** See Australian & South African plants.

**Anemone** Many cultivars of Anemone are listed by Trehane (1989). The cultivars of *A. nemorosa* L. are listed by the Royal General Bulbgrowers' Association (1991) and Toubol (1981). The history and performance of cultivars of *Anemone japonica* (Thunb.) Sieb. & Zucc. are discussed by Clausen (1972a) and Hensen (1968, 1979).

**Antirrhinum** The cultivars and performance of the snapdragons are listed by the Royal Horticultural Society (1913b).

**Arctostaphylos** The cultivars of the bearberries and manzanitas are recorded by Keeley & Keeley (1994).

**Ardisia** The Japanese cultivars of *Ardisia japonica* (Hornst.) Blume, the marlberry, are discussed by Yinger & Hahn (1985).

**Argyranthemum** The cultivars of the marguerite are compared and contrasted with studio photographs by Cheek (1993).

**Aster** The most comprehensive lists of the cultivars of the asters are by Meier (1973a, 1973b, 1973c, 1973d) and Jensma (1989); the latter is being expanded and revised. Kelsey & Dayton (1942), Royal Horticultural Society (1902, 1908a, 1926a), and Trehane (1989) discuss the cultivars of the hardy asters, but these are published without introduction dates or background. Ranson (1946) lists mostly species with few cultivars. The history and performance of cultivars of the asters are discussed by Allen (1983), Clausen (1973a), and Jelitto & Schacht (1990). Barret (1959) discusses the performance of cultivars of *A. ericoides* L.

**Astartea** See Australian & South African plants.

**Astilbe** The most comprehensive published list of Astilbe cultivars is Ievinya & Lusinya (1975) with c. 170 cultivars, detailed descriptions of c. 50, and an extensive bibliography. Hensen (1969) discusses the history and performance of species and cultivars of Astilbe. Jelitto & Schacht (1990), the Royal Horticultural Society (1970b), Schneider (1968), and Trehane (1989) also list cultivars of Astilbe.

**Aubrieta** The cultivars of *A. columnae* Guss., *A. deltoidea* (L.) DC., and *A. intermedia* Heldr. & Orph. are thoroughly discussed by Clausen (1973c) and Hensen (1976). Jelitto & Schacht (1990) and Trehane (1989) also list cultivars of Aubrieta.

**Australian & South African plants** The Australian Cultivar Registration Authority has circulated a continually updated list (for example, 1988) of registered cultivars of Acacia, Agonis, Anigozanthos, Astartea, Baeckea, Banksia, Baura, Blechnum, Boronia, Brachychiton, Brachycome, Callistemon, Callitris, Ceratopetalum, Chamelaucium, Correa, Crowea, Epacris, Eremophila, Eriostemon, Eucalyptus, Eucryphia, Grevillea, Hakea, Hardenbergia, Helichrysum, Hypocalymma, Kennedia, Kunzea, Lechmemailia, Leptospermum, Lophostemon, Melaleuca, Myoporum, Pandorea, Pimelea, Plectranthus, Prostanthera, Pultenaea, Scaevola, Spyridium, Telopea, and Tetratheca.
Baeckea  See Australian & South African plants.
Banksia  See Australian & South African plants and
Proteaceae.
Baura  See Australian & South African plants.
Begonia  The most comprehensive checklist of begonias is
Ingles [1990]. This should be supplemented with Kelsey
& Dayton [1942], Thompson [1976–1978, 1984], and
Thompson & Thompson [1980, 1982]. Cultivars of B.
semperflorens-cultorum hybrids are published by
Maatsch [1962], Maatsch & Nolting [1969, 1971a], and
of tuberous begonias are listed by Haegeman [1978,
1979] and Langdon [1969]. Cultivars of other begonias
are published by the American Begonia Society [1957, 1958, 1962, 1967, 1985]. Registrations in
The Begonian are summarized by Vrugtman [1972]. These should be used in conjunction with
Berberis  Schneider [1923] covers the publication history and descriptions of cultivars of
the barberries. The cultivars of the barberries are also listed by Ahrendt [1942, 1949, 1961],
Krüssmann [1984–1986], Laar [1972], and Wyman [1962b].
Bergenia  The cultivars of the bergenias are discussed by Beckett [1983], Laar [1973], and Yeo
[1971a, b].
Betula  Cultivars of the birches are listed by Ashburner [1980], Fontaine [1970a], Grootendorst
[1973a], Jong [1986], Santamour & McArdle [1989], and Wyman [1962c]. Cultivars of Betula are
Blechnum  See ferns.
Boronia  See Australian & South African plants.
Bougainvillea  The most comprehensive discussions of cultivars of bougainvillea are Choudhury
& Singh [1981] and MacDaniels [1981]. Previous checklists are Anonymous [1959c] and Gillis
[1976]. Subsequent registrations are recorded by Singh [1986].
Brachychiton  See Australian & South African plants.
Brachycome  See Australian & South African plants.
Bromeliaceae  A preliminary checklist of bromeliad cultivars has been prepared by Beadle [1991]
and the Bromeliad Society [1989].
Brunsvigia  See Amaryllidaceae.
Bucinellina  See Gesneriaceae.
Buddleja  The cultivars of the butterfly bushes are listed by Leeuwenberg [1979] but without
dates of introduction or hybridizers. Cultivars of the butterfly bushes are also discussed by
Bulbs  The cultivars of many hardy and tender bulbs are published by the Royal General Bulb-
growers' Association [most recent is 1991]. Many cultivars are also listed in Trehane [1989].
Buxus  A guide for registration and documentation of cultivar names of Buxus is provided by
Dudley & Eisenbeiss [1971]. The cultivars of boxwood are listed by Bean [1970–1988], Batdorf
Cactaceae  Cultivars of many succulents, including cacti, are listed by Jacobsen [1977].
The cultivars of Epiphyllum, the orchid cacti, are thoroughly discussed by Rainbow Gardens
[1979], along with cultivars of Epiphyllum x Aporocactus. This should be supplemented with
Hashizume (c. 1982–1985), who provides good color photographs and English captions in his guide to taxa of *Epiphyllum*; additional color photographs are presented by Leue (c. 1987). The cultivars of *Schlumbergera* are discussed by Horobin (1985).

**Caladium** The cultivars of the caladiums are evaluated for landscaping by Wilfret (1984).

**Callistemon** See Australian & South African plants.

**Callistephus** The cultivars of the China aster, *C. chinensis* (L.) Nees, are assembled into checklists by Maatsch (1958, 1964), Maatsch & Nolting (1971c), Nolting & Zimmer (1975c, 1981, 1987), and Olimsted et al. (1923).

**Callitris** See Australian & South African plants.


**Camellia** Bean (1970–1988), Durrant (1982), Erdman (1949), Gerbing (1945), Hertrich (1954–1959), Hume (1955), Krüssmann (1984–1986), Macoboy (1981), and Sharp (1957) list many cultivars of camellias, but Woodroffe & Donnall (1990) is probably the best compact checklist, while Savidge (1993) is probably the most complete list with 41,000 cultivars. The Japanese cultivars of camellias are listed by Tuyama (1968), while the Chinese cultivars are listed by the Kunming Institute of Botany, Academica Sinica (1986). The International Camellia Society expects to publish the International Camellia Register.

**Campanula** The history and performance of cultivars of the bellflowers are discussed by Clausen (1976) and Lewis & Lynch (1989). Trehane (1989) also lists the cultivars of the bellflowers.

**Canna** Kelsey & Dayton (1942) has published a list of canna cultivars without dates and hybridizers. Additional information is given by the Royal General Bulbgrowers' Association (1991), Royal Horticultural Society (1908b, 1909), and Trehane (1989). Mukherjee & Khoshoo (1970) provide botanical characteristics of many cultivars.

**Capsicum** The peppers are sometimes grown as ornamentals (e.g., 'Fips'), and Andrews (1984) records extensive information on these cultivars in her monumental book.

**Carnivorous plants** Named cultivars of *Drosera*, *Nepenthes*, and *Sarracenia* are listed by Schlauer (1986, 1987; note that the first list neglects to capitalize the cultivars) and Kusakabe (1987). Additional cultivars of *Sarracenia* are later listed by Mellichamp & Gardner (1987). The hybrids of *Nepenthes* are reported by Fleming (1979). Fleming's list is reprinted in Pietropaolo & Pietropaolo (1986). An additional cultivar of *Nepenthes* is listed by Robinson (1989).

**Carpinus** Cultivars of *Ostrya*, the hop hornbeams, and *Carpinus*, the hornbeams, are discussed by Rushforth (1985), Schneider (1965a), and Wright (1986). Cultivars of *Carpinus* and *Ostrya* are also discussed by Bean (1970–1988) and Krüssmann (1984–1986).

**Castanea** The cultivars of the potentially blight-resistant chestnuts are discussed by Jaynes & Graves (1963) and Nienstaedt & Graves (1955).

**Ceanothus** Van Rensselaer & McMinn (1942) provide the most comprehensive listing of the wild-lilacs and buckrushes. Additional cultivars are listed by Bean (1970–1988), Hogan (1988),

**Ceratopetalum** See Australian & South African plants.

**Cercis** The cultivars of the redbuds are discussed by Raulston (1990).


**Chamelaucium** See Australian & South African plants.

**Chrysanthemum** See *Argyranthemum* for the marguerite and *Dendranthema* for the florist's chrysanthemum.

**Cistus** The cultivars of the rock roses are discussed by Bean (1970–1988), Warburg (1931), and Warburg & Warburg (1930).

**Citrus** The cultivars of *Citrus*, some ornamental, are listed by Hodgson (1967).

**Clematis** A general clematis checklist is Lloyd (1965, 1989); Fretwell (1989) provides good color photographs. The cultivars of *C. viticella* L. are listed by Rogerson (1985). The large-flowered clematis hybrids are published by Evison (1985) and Spingarn (1935), while the hybrids of section *Atragene* are published by Pringle (1973). Kelsey & Dayton (1942) also provide a list of *Clematis* but without introduction dates and background. Some cultivars are also published by Laar (1985), Markham (1935), and Trehane (1989).

**Codiaeum** The list for the garden croton, *Codiaeum variegatum* (L.) Blume, of Kelsey & Dayton (1942) provides no introduction dates or background. Additional cultivars are listed by Anonymous (1959a) and Brown (1960). The latter provides good color illustrations but also includes a number of botanical errors.

**Coleus-Plectranthus** While no proper checklist exists for coleus cultivars, Pedley & Pedley (1974) and Stout (1916) provide many materials for the production of such a list. Recent registrations of *Plectranthus* are listed by the Australian Cultivar Registration Authority (1988).

**Columnea** See Gesneriaceae.

[1961c] discusses cultivars of four arborvitae species. Hemlock
(Tsuga spp.) cultivars are documented in Swartley (1984).
These should be supplemented with the color photographs of
Harrison (1975) and Gelderen & van Hoey Smith (1986) and the
black and white photographs of Welch (1979).
**Cordyline** A list for the cultivars of the ti, *Cordyline terminalis*
[L.] Kunth, is Kelsey & Dayton (1942) but without introduction
dates and background. Additional cultivars are listed by
Anonymous (1959d).
**Cornus** Cultivars of the dogwoods are listed by Bean (1970–
1988), Howard (1961), Krüssmann (1984–1986), and Santamour
& Mc Ardle (1985a). Jaynes, Brand, & Arnow list the cultivars
of the kousa or Japanese dogwood, *C. kousa* Hance. Additional
registrations are recorded by Spongberg (1988, 1990).
**Correa** See Australian & South African plants.
**Corylus** Bibliographic references to the cultivars of the filberts
are recorded by Debor (1978).
**Cosmos** The Indian cultivars of cosmos are listed by Anonymous (1959b).
**Cotoneaster** The cultivars of the rock sprays are treated by Bean (1970–1988), Grootendorst
**Crataegus** Wyman (1962d) lists the cultivars of the hawthorns but with few introduction dates
also discuss the cultivars of the hawthorns.
**x Crinodonna** See Amaryllidaceae.
**Crinum** The cultivars of the spider lilies are listed by Hannibal (1970–71).
**Crocosmia** The cultivars of the montbretias are listed by Kostelijk (1984).
**Crocus** The cultivars of crocus are documented by the Royal General Bulbgrowers’ Association
(1991), but further information is provided by Ruksans (1981) and Trehane (1989).
**Crowea** See Australian & South African plants.
**Cryptomeria** See conifers.
**Cyclamen** Some cultivars of *Cyclamen* are recorded by Grey-Wilson (1988), the Royal General
Bulbgrowers’ Association (1991), Trehane (1989), and Wellensiek (1961), while a comprehensive
list of cultivars is Wellensiek et al. (1961).
**Cytisus** The cultivars of the brooms (*Cytisus* and *Genista*) are treated by Bean (1970–1988),
**Daboecia** *Daboecia* cultivars are included in many listings of heaths and heathers (e.g., Johnson,
1986), and Laar (1977b).
**Dahlia** The most comprehensive checklist of dahlias is that of the Royal Horticultural Society
(1969a) and later supplements (1988d, 1989c, 1992a). Unfortunately, with one exception [a
cultivar from 1850], this list omits all cultivars 1789–1859 and many of the cultivars 1860–
1900. Many early twentieth-century cultivars are amply covered in Norton (1924), Olmsted et
al. (1923), and Sandhack (1927). Recent cultivars are listed by the American Dahlia Society (e.g.,
1989) in a paperbound booklet as a supplement to the *Bulletin of the American Dahlia Society*.
**Dalbergaria** See Gesneriaceae.
**Daphne** The cultivars of *Daphne* are listed by Brickell & Mathew [1976], Bean [1970–1988], Hodgkins [1961], and Krüssmann [1984–1986] also discuss the cultivars of *Daphne*.


**Desmodium** The cultivars of the tick trefoils are listed by Lemmens [1985/].

**Deutzia** The cultivars of the deutzias are discussed by Bean [1970–1988] and Krüssmann [1958b].

**Dianthus** The Royal Horticultural Society has published the international register for pinks and carnations [1983] with supplements [1984b, 1985b, 1986b, 1988b, 1988c, 1989b, 1990a], which supersede the 1974 list. These lists are very comprehensive, but American cultivars (such as 'Aqua') are slow to be integrated. These checklists should be used in conjunction with Bailey [1990], Mansfield [1951], Sitch [1975], and Smith [1990]. The history and performance of *D. gratianopolitanus* Vill. and *D. plumarius* L. are discussed in Hensen [1981]. Kelsey & Dayton [1942] include American carnation cultivars. Jelitto & Schacht [1990] and Trehane [1989] also list many cultivars of perennial *Dianthus*.

**Diastema** See Gesneriaceae.

**Diervilla** The cultivars of the bush honeysuckles are discussed by Schneider [1930].

**Dracaena** The Indian cultivars of the dracaenas are listed by Anonymous [1959d].

**Drosera** See carnivorous plants.

**Echeveria** Carruthers & Ginns [1973] list cultivars of *Echeveria* but provide no dates.

**Epacris** See Australian & South African plants.

**Epimedium** The cultivars of the epimediums are listed by Laar [1981a].

**Epiphyllum** See Cactaceae.

**Episcia** See Gesneriaceae.

**Eremophila** See Australian & South African plants.


**Erigeron** The history and performance of cultivars of the daisy fleabanes are discussed by Clausen (1972b), Hensen (1966), Jelitto & Schacht (1990), and Oudshoorn (1975). Trehane (1989) also lists many cultivars of the daisy fleabanes.

**Eriostemon** See Australian & South African plants.

**Erodium** The cultivars of the heron's bills are listed by the British Pelargonium and Geranium Society [1970].

**Erythrina** The species and cultivars of Erythrina are listed by McClintock (1982/).


**Eucalyptus** See Australian & South African plants.

**Eucodonia** See Gesneriaceae.

**Eucryphia** The cultivars of Eucryphia are discussed by Wright (1983a) but with no introduction dates or background. Bean (1970–1988) and Krüssmann (1984–1986) also list some cultivars. Recent registrations are listed by the Australian Cultivar Registration Authority [1988].


**Ferns** Maatsch (1980) lists cultivars of ferns with descriptions, background information, and English vernacular names. Jones (1987) and Mickel (1994) list many cultivars of ferns. The cultivars of Adiantum, maidenhair ferns, are listed in Goudy (1985). The cultivars of the staghorn ferns, Platycerium, are listed by Vail (1984). The cultivars of the royal ferns, Osmunda regalis L., are listed by Anderson (1971). Recent registrations of Blechnum are listed by the Australian Cultivar Registration Authority (1988).


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1973) describe and picture many of these cultivars. These should be used in conjunction with
Manthey [1990], Proudley [1975], and Thorne [1959].

**Gaillardia** The cultivars and performance of the gaillardias are listed by the Royal Horticultural
Society [1930c].

**Galanthus** The cultivars of the snowdrops are listed by Bowles [1956], the Royal General
Bulbgrowers’ Association [1991], Trehane [1989], and Yeo [1975].

**Genista** The cultivars of the brooms (Cytisus and Genista) are treated by Bean [1970–1988],
Krüssmann [1984–1986], and Laar [1971].

**Gentiana** Bartlett [1975] includes many cultivars of gentians in her book. Many cultivars are also
listed by Trehane [1989].

**Geranium** The history and performance of cultivars of the hardy
geraniums are discussed by Clausen [1974b]. Yeo [1985] includes
information on many cultivars of the hardy geraniums in his
comprehensive book. Clifton [1992], Jelitto & Schacht [1990],
Trehane [1989], and Walsweer [1988] list many cultivars.

**Gesneriaceae** Cultivars of *Achimenes*, the orchid pansies, are
listed by the American Gesneria Society [1957], Arnold [1969],
and Townsend [1984]. Cultivars of *Aeschynanthus* are listed by
Dates [1990]. Cultivars of *Columnnea* and allied genera
(*Bucinellina, Dalbergaria, Pentadenia*, and *Trichantha*) are
listed by Arnold [1963b, 1966] and Dates [1987]. Cultivars of
*Episcia* and *Alsobia*, the carpet plants, are listed by the American
Gesneria Society [1957], Arnold [1963a, 1968, 1977], and
Dates [1993]. Cultivars of *Kohleria*, the tree gloxinias, and
*Smithiantha* are listed by the American Gesneria Society
[1957], the American Gloxinia Society [1962], Batcheller [1985],
and Moore [1953]. Cultivars of *Nematanthus* are listed by
Arnold [1975]. The master variety lists for *Santapaulia*, the
Rector [1963], and Tretter [1976] and should be supplemented with Kawakami [c. 1981], who
includes English captions and a Japanese text with color photographs. Cultivars of *Sinningia*
are listed by Arnold [1975] and Dates [1988]. Cultivars of *Streptocarpus*, the Cape primroses,
are listed by Arnold [1972, 1979] and Brown [1973]. Intergeneric hybrids in the tribe Gloxinieae
(which includes *Achimenes, Diastema, Eudoconia, Gloxinia, Heppiella, Koellikeria, Kohleria, Monopyle, Moussonia, Niphaea, Parakohleria, Smithiantha*, and *Solenophora*) are listed by
Dates [1986].

**Geum** The history and performance of cultivars of *Geum* are discussed by Clausen [1975] and

**Ginkgo** The cultivars of ginkgo (*G. biloba* L.) are discussed by Bean [1970–1988], Born [1982],
Krüssmann [1984–1986], and Santamour, He, & McArdle [1983].

**Gladiolus** Pieters [1905] is the first list of cultivars of gladiolus that we have discovered. The
cultivars of gladiolus are later listed by Hottes [1916], Olmsted et al. [1923], the American
Gladiolus Society [1931], Birch [1940], Pridham [1932], the Royal General Bulbgrowers’ Association
[1991], Sandhack [1927], and Trehane [1989]. Many of these cultivars are incorporated into
Fisher et al. [1975]. Additions are published by Fisher [c. 1983].

Santamour & McArdle (1983b), and Wagenknecht (1961a) discuss the cultivars of the honey locust (G. triacanthos L.).

Gloriosa Narain (1988), the Royal General Bulbgrowers’ Association (1991), and Trehane (1989) list cultivars of the climbing lilies.

Gloxinia See Gesneriaceae.

Grevillea The grevilleas are discussed by Larkman (1985). Recent registrations are listed by the Australian Cultivar Registration Authority (1988). See also the entry for Proteaceae.

Hakea See Australian & South African plants and Proteaceae.

Halesia The cultivars of the silverbells are listed by Fontaine (1970b).


Hardenbergia See Australian & South African plants.


Hedychium The cultivars of the ginger lilies are discussed by Schilling (1982).

Hedysarum The cultivars of the Hedysarum species are listed by Lemmens (1985).

Helianthemum The history and performance of cultivars of the rock roses are discussed by Clausen (1968) and the Royal Horticultural Society (1926d). Jelitto & Schacht (1990) and Trehane (1989) also list cultivars.

Helianthus The history and performance of cultivars of the sunflowers are discussed by Clausen (1974c). Trehane (1989) also lists cultivars.

Helichrysum See Australian & South African plants.

Heliconia The cultivars of Heliconia are discussed by Berry & Kress (1991).

Heliopsis The history and performance of cultivars of Heliopsis are discussed by Clausen (1974a) and Hensen (1983b). Jelitto & Schacht (1990) and Trehane (1989) also list cultivars.

Helleborus The cultivars of the hellebores are discussed and illustrated in black and white drawings by Ahlburg (1993) and appended to the rear of Mathew (1989b), but the most comprehensive descriptions, with color photographs, seem to be Rice & Strangman (1993).

Hemerocallis The daylilies are first listed by Stout (1934) and Norton et al. (1949), and later in publications of the American Hemerocallis Society (1957, c. 1973, c. 1984). The species and old cultivars are discussed by Kitchingham (1985). Jelitto & Schacht (1990) and Trehane (1989) also list cultivars. Additional information is provided by Munson (1989) and Webber (1988). These should be used in conjunction with Darrow & Meyer (1968), Erhardt (1992), and Stout (1986).

Heppiella See Gesneriaceae.
**Heuchera** The history and performance of the coralbells are discussed by Clausen (1970) and Hansen & Sieber (1970). Jelitto & Schacht (1990) and Trehane (1989) also list cultivars.


**Hippeastrum** See Amaryllidaceae.


**Hosta** The most comprehensive discussion of the hostas is Schmid (1991). The cultivars of the hostas are also listed in the comprehensive works by Hensen (1963a, 1963b, 1983a, 1985) with comments by Grenfell (1986). These should be supplemented with Aden (1990), Fisher (1979), Grenfell (1990), Jelitto & Schacht (1990), Laar (1967), and Trehane (1989).

**Houseplants** Cultivars of houseplants are pictured and briefly discussed by Graf (1986a, 1986b).

**Hyacinthus** The cultivars of hyacinths are documented by the Royal General Bulbgrowers’ Association (1991), but further information is provided by Darlington, Hair, & Hurcombe (1958). Trehane (1989) also lists the cultivars of hyacinths.


**Hypocalymma** See Australian & South African plants.


**Impatiens** The cultivars of the New Guinea impatiens are discussed by Agnew & Lang (1992), Eichin & Deiser (1988), and Winters (1973).

**Indigofera** The cultivars of the indigos are listed by Lemmens (1985).
Iris  Jelitto & Schacht (1990) and Trehane (1989) list many cultivars of the hardy iris but with scant information. In contrast, the listings of cultivars of bearded irises published by Peckham (1929, 1940), Douglas (1949), Knowlton (1959), Nelson (1971), and Nelson & Keppel (1981, 1991, 1992a, 1992b, 1993) are rich with information. The Royal Horticultural Society (1928, 1930b) and Sand (1925) provide additional descriptions of many pre-1930 bearded irises. While the American Iris Society has published yearly checklists since the 1979 checklist, the 1989 checklist is still in press.


Ixora  Anonymous (1958c) is a checklist of the cultivars of the ixoras.


Juniperus  See conifers.


Kennedia  See Australian & South African plants.

Kniphofia  The cultivars of the torch lilies are discussed by Jelitto & Schacht (1990), Taylor (1985a, b), and Trehane (1989).

Koellikeria  See Gesneriaceae.

Kohleria  See Gesneriaceae.

Kunzia  See Australian & South African plants.

Lagerstroemia  The cultivars of crape myrtles are listed by Egolf & Andrick (1978) and Krussmann (1984–1986).


Lathyrus  Kelsey & Dayton (1942), Royal Horticultural Society (1926b), and Unwin (1926) are checklists of sweet peas, Lathyrus odoratus L. Cultivars of the hardy perennial species are listed by Trehane (1989).

Lavandula  The cultivars of lavender (L. angustifolia Mill.) and lavandin (L. x intermedia Emeric ex Loisel.) are discussed by Hensen (1974), Krussmann (1984–1986), and Tucker & Hensen (1985).

Lechenaultia  See Australian & South African plants.

Leptospermum  Krussmann (1984–1986) and Metcalf (1963) are checklists of Leptospermum cultivars (mostly L. scoparium J. R. Forst & G. Forst). Recent registrations are listed by the Australian Cultivar Registration Authority (1988).
Lespedeza  The cultivars of the bush clovers are listed by Lemmens (1985). An additional cultivar is listed by Huttleston (1991).

Leucadendron  See Proteaceae.

Leucospermum  See Proteaceae.


Lewisia  The cultivars of the lewisias are discussed by Mathew (1989a).

Ligularia  The cultivars of Ligularia are discussed by Dress (1982).


Liriope  See Ophiopogon-Liriope.

Lobelia  The tetraploid cultivars of the Lobelia siphilitica–L. cardinalis complex are listed by Bowden (1983).


Lophostemon  See Australian & South African plants.

Lupinus  The cultivars and performance of the lupines are discussed by the Royal Horticultural Society (1931a).

Lyrthrum  The cultivars of Lythrum are discussed by Harp (1975).

Magnolia  Tresender (1978) lists many cultivars of magnolias, and while dates and hybridizers are generally absent, the descriptions are good. Gardiner (1989) thoroughly discusses magnolia hybrids with photographs. Additional registrations are listed in Bean (1970–1988), Krüssmann (1984–1986), and Vrugtman (1972). Fogg & McDaniel (1975) is a comprehensive list of magnolia cultivars. New cultivars of magnolias are published in Magnolia Journal.


Malus  Bom (1982), den Boer (1959), Grootendorst (1964a), Lombarts (1984), Preston (1944), Van Eseltine (1933, 1934), and Wyman (1943, 1955) include descriptions and introductions of crabapples. (The 1943 edition of Wyman has some information dropped from the 1955 edition, including discarded cultivars and citations to a bibliography.) Jefferson (1970) clarifies the misnaming of crabapple cultivars and provides an extensive bibliography. Bean (1970–1988) and Krüssmann (1984–1986) also list the cultivars of the ornamental crabapples. Lately, crabapple registrations have been carried by the Arnold Arboretum and published in HortScience (Spongberg, 1988, 1989).

Melaleuca  See Australian & South African plants.
**Melia**  The cultivars of the Persian lilac or Chinaberry (*Melia azedarach* L.) are listed by Mabberly (1984).

**Monarda**  The beebalms are discussed by Oudolf (1993).

**Monopyle**  See Gesneriaceae.

**Moussonia**  See Gesneriaceae.

**Myoporum**  See Australian & South African plants.

**Nandina**  The landscape values of cultivars of heavenly bamboo, *N. domestica* Thunb., are discussed by Raulston (1984).

**Narcissus**  For many years the Royal Horticultural Society printed classified lists of daffodils (1908d, 1910, 1931b, 1938, 1948, 1955, 1958, 1961, 1965, 1969c, 1975), but many of these were not cumulative. The most comprehensive list of cultivars of daffodils is by the Royal Horticultural Society (Kington, 1989a), which updates the 1969 classified list and the classified list and international register of 1975 with supplements 1–14; supplements 15–18 are printed separately (Kington, 1989b, 1990, 1991, 1992). A checklist of daffodils has been provided as a continually updated computer printout by Throckmorton (n.d.), but very old cultivars are listed without a date. The history of cultivar registration of daffodils by the Royal Horticultural Society is documented by Donald (1986). Trehane (1989) also lists cultivars of daffodils. Abridged lists of exhibition daffodils are published by the American Daffodil Society (1977, 1985, 1989). These should be used in conjunction with Bourne (1903), Bowles (1934), Lee (1966), Tompsett (1982), and the “Narcissus editions” of *Herbertia* (vol. 13, 1946) and *Plant Life/Herbertia* (vol. 9, no. 1, 1953).

**Nematanthus**  See Gesneriaceae.

**Nepenthes**  See carnivorous plants.

**Nerine**  See Amaryllidaceae.

**Nerium**  The cultivars of the oleanders are discussed by Anonymous (1958a) and Pagen (1987).

**Nigella**  The cultivars of *Nigella* are listed by Sorvig (1983).

**Niphaea**  See Gesneriaceae.

**Nymphaeaceae**  The most comprehensive list of waterlily cultivars is Swindells (1989b). The cultivars of waterlilies are also treated in Anonymous (1960); Conard (1905); Henkel, Rehnelt, & Dittmann (1907); Kelsey & Dayton (1942); Swindells (1983); and Trehane (1989).

**Ophiopogon-Liriope**  The cultivars of *Ophiopogon* and *Liriope* are discussed by Hume (1961).

**Orchidaceae**  A guide to orchid hybrid (grex) registration is published by Hunt (1986). While lists have been previously published by Sanders, Sanders (1946) is the last cumulative checklist of orchid hybrids; a list of intergeneric taxa is listed in Table II. Later, noncumulative supplements have been published (Sanders & Wreford, 1961; Royal Horticultural Society, 1972, 1980, 1981, 1985c, 1986c). Japan Orchid Growers Association (n.d.) has excellent color photographs of cultivars derived from *Cattleya*. Only Poliakoff (1987) lists *Vanda* cultivars with the percentage of genetic background of each ancestral species. Gilmour, Greatwood, & Hunt (1976) give the names of intergeneric hybrids.
Origanum The cultivars of Origanum, the marjorams, are discussed by Tucker & Rollins (1989). Trehane (1989) lists some additional cultivars.

Osmunda See ferns.

Ostrya See Carpinus.

Paeonia The cultivars of the peonies are first listed by Coit (1907), later by Beal (1920) and Kelsey & Dayton (1942), and most recently by Jelitto & Schacht (1990) and Trehane (1989). The most comprehensive listing is by Kessenich (1976). These checklists should be supplemented with Wister (1962) for fuller descriptions and a comprehensive bibliography. Haworth-Booth (1963) and Krussmann (1984-1986) also supply further information on the tree peonies. American peony hybrids are listed by Kessenich (1990). Later introductions have been published in the American Peony Society Bulletin.

Pandorea See Australian & South African plants.

Papaver The primary reference on poppy cultivars is Grey-Wilson (1993). The cultivars of the oriental (P. orientale L.), Iceland (P. nudicaule L.), and other poppies are also listed by Kelsey & Dayton (1942).

Parakohleria See Gesneriaceae.

Parthenocissus The cultivars of Boston ivy, P. tricuspidata (Sieb. & Zucc.) Planch, are listed by Laar (1981b, 1992).

Passiflora The cultivars of Passiflora, the passion flowers, are thoroughly discussed by Vanderplank (1991).


Pentadenia See Gesneriaceae.

Perennials, herbaceous Grunert (1982), Jelitto & Schacht (1990), Krüssmann, Siebler, & Tangermann (1970), Phillips & Rix (1991), Thomas (1990), and Wehrhahn (1931) rank high among the available reference works on hardy herbaceous plants because of the wealth of information. The perennials registered by the International Registration Authority for Hardy Perennial Plants are listed by Sieber (1990a, 1990b). The cultivars of perennials, based primarily upon British catalogs, are listed by Philip (1992); perennial cultivars based upon northern European sources are listed by Laar & Fortgens (1990). Cultivars of perennials based upon American catalogs are listed by Isaacson (1989). Trehane (1989), emphasizing the cultivars available in the United Kingdom and Northern Europe, provides many dates and names of introducers. Though these latter three publications are excellent, they reinforce some incorrect synonyms by uncritically accepting catalog listings.

Pernettya The cultivars of Pernettya are listed by Laar (1969) and Vogel (1969).

Petunia Petunia cultivars are listed by Maatsch & Nolting (1968, 1971b) and Nolting & Zimmer (1975b, 1980b, 1984, 1987); the earliest cultivar in these is dated 1947.

**Phlox**  Probably the most comprehensive list of phlox cultivars is Trehane (1989), but very few dates are provided. Jelitto & Schacht (1990), Kelsey & Dayton (1942), Kharchenko (1975), and Symons-Jeune (1953) also list phlox cultivars.

**Phormium**  The cultivars of New Zealand flax are discussed by Cheek (1979) but more thoroughly by Heenan (1991). New cultivars are listed by Hornback (1994).

**Phygelius**  Cultivars of *Phygelius* are discussed by Coombes (1988). Trehane (1989) also lists cultivars.

**Picea**  See conifers.


**Pimelea**  See Australian & South African plants.

**Pinus**  See conifers.

**Plagianthus**  The cultivars of *Plagianthus* are listed by Wright (1983a).


A review of the U.K. system of Plant Breeders’ Rights (PBR) is Goodwin (1986). The patenting of plants under the European Patent Convention (EPC) and The International Union of the Protection of New Varieties of Plants (UPOV) has been reviewed by Byrne (1986), Mast (1986), and Schneider (1986b).

**Platanus**  The cultivars of the plane trees are discussed by Santamour & McArdle (1986).

**Platycerium**  See ferns.

**Plectranthus**  See Coleus-Plectranthus.


**Poaceae, Cyperaceae, and Juncaceae**  The best listings of the ornamental grasses, sedges, and rushes are Darke (1990), Hensen & Groendijk-Wilders (1986b), and Trehane (1989). These should be supplemented with Jelitto & Schacht (1990), Loewer (1988), Meyer (1975), Grounds (1979), Ottesen (1989), and Reinhardt et al. (1989). Lawson (1968) lists some cultivars of bamboos.


**Potentilla**  Hachmann et al. (1986a), Jelitto & Schacht (1990), Schmalscheidt (1984), and Trehane (1989) list the cultivars of *Potentilla*. The cultivars of the shrubby potentillas are discussed by


**Prostanthera** The few cultivars of the mint shrubs are briefly mentioned by Althofer (1978).

**Protea** See Proteaceae.


**Prunus** Chadburn (1972) is recommended for cultivars of many flowering cherries. The Oriental flowering cherries are listed by Russell (1934), while the purpleleaf plums are discussed by Jacobson (1992). Only the Sato-zakura group of the Japanese flowering cherries has been published as a separate checklist (Jefferson & Wain, 1984). The bibliography of this checklist, however, gives invaluable references on other ornamental Prunus. These should be supplemented with Bom (1982), Grootendorst (1964b), Ingram (1948), Laar (1970b), Miyoshi (1916), Ohwi & Ohta (1973), and Wilson (1916). Other ornamental Prunus are listed by Bean (1970–1988), Huttleston (1986, 1990), and Krüssmann (1984–1986).

**Pterostyrax** The cultivars of the epaulette trees are listed by Fontaine (1970b).

**Pulmonaria** Cultivars of the lungworts are reviewed by Mathew (1982), Jelitto & Schacht (1990), and Trehane (1989) but generally without introduction dates or names of originators.

**Pultenaea** See Australian & South African plants.


**Rhododendron** Brickell (1980) provides guidelines for naming *Rhododendron* cultivars. The cultivars of rhododendrons and azaleas are first documented in Fletcher (1958), and this is updated by Royal Horticultural Society (1964, 1969b, 1988e, 1989d, 1989e, 1990c, 1991b, 1992c, 1993b); the registrations from 1962 to 1987 were originally published in *The Rhododendron and Camellia Yearbook* and *Rhododendron with Magnolias and Camellias*. Kraxberger (1980) lists American *Rhododendron* hybrids, many of which were originally published in *Rhododendrons and Rhododendron Notebook*; more recently the American


**Rosmarinus** The origins and essential oils of cultivars of rosemary are listed by Tucker & Maciarello (1986).

**Saintpaulia** See Gesneriaceae.


**Sambucus** The cultivars of European red elderberry, *S. racemosa* L., are described in German and Latin by Wolf (1923). Bean (1970–1988) and Krüssmann (1984–1986) also discuss cultivars of the elderberries.

**Sansevieria** The cultivars of the snakeplants are listed by Morgenstern (1979), Stover (1983), and Swinbourne (1979) but without introduction dates and background. Chahinian (1986) thoroughly treats the cultivars of *S. trifasciata*.

**Sarracenia** See carnivorous plants.

**Saxifraga** The saxifrages are listed by Köhlein (1984) but without introduction dates or background. Jelitto & Schacht (1990), Trehane (1989), and Webb & Gornall (1989) are comprehensive lists of species and cultivars.
Scabiosa The annual derivatives of *S. atropurpurea* L. are listed by the Royal Horticultural Society (1926c). Perennial cultivars are listed by Jelitto & Schacht (1990).

Scaevola See Australian & South African plants.

Schizostylis The cultivars of the *Kaffir* lily are listed by Straley (1984).

Schlumbergera See Cactaceae.

Sedum Praeger (1921) and Trehan (1989) list the cultivars of *Sedum*. The history and performance of cultivars of *Sedum* are discussed by Clausen [1978]. Hensen & Groendijk-Wilders (1986a) discuss the sedums cultivated in Europe. Some cultivars of sedums are listed by Evans (1983) and Jelitto & Schacht (1990) but without introduction dates or background.

Sempervivum The cultivars of *Sempervivum* (and *Jovibara*) are listed by Mitchell [c. 1973] with some color photographs and good descriptions but without dates or background. Subsequent registrations for *Sempervivum* (and *Jovibara* and *Rosularia*) were published by Mitchell (1982, 1983, 1985). Trehan (1989) also lists the cultivars of the houseleeks.

Serruria See Proteaceae.

Sinningia See Gesneriaceae.


Smithiantha See Gesneriaceae.

Solenophora See Gesneriaceae.


Spathiphyllum The cultivars of the spathiphyllums are briefly listed by Chase et al. (1984).


Spyridium See Australian & South African plants.

Streptocarpus See Gesneriaceae.

Styrax The cultivars of the snowbells are listed by Fontaine (1970b) and reviewed by Raulston (1992).


Taxus  See conifers.
Telopea  See Australian & South African plants and Proteaceae.
Tetratheca  See Australian & South African plants.
Thuja  See conifers.

Trees, shrubs, and woody vines (broad-leaved)  The best general references on the introduction dates and descriptions of many broad-leaved trees, shrubs, and vines have been Bean [1970-1988] and Krüssmann [1984-1986]. Rehder [1940, 1949] also lists many forma epithets; because these are published before the first International Code of Nomenclature for Cultivated Plants in 1952, the forma epithets are now considered cultivar names. Other woody species are listed by Buckley [1980], Commissie voor de samenstelling van de Rassenlijst voor Bosbouwgewassen [1990], Darthuizer Boomkwekerijen B. V. [1987], Dirr [1990], Hillier [1982, 1991], Laar [1989], and Wyman [1963a, 1963b, 1966, 1967, 1969a]. The mimeographed Swarthmore Plant Notes (Wister, 1954) are a treasure trove of information on cultivars of woody plants but, unfortunately, are not widely distributed. Registrations of recent woody genera have been published in HorticScience [Hurtleston, 1986, 1988, 1989, 1990; Spongberg, 1988, 1989, 1990], while Hurtleston [1986] summarizes previous registrations. Cultivars of street trees are summarized by Gerhold et al. [1989] and Wandell [1989]. Some trees and shrubs are also discussed in Hogan (1988) and the journal Dendroflora [see the cumulative indices in numbers 20 and 25].

Trichantha  See Gesneriaceae.
Trollius  The cultivars of the globe flowers are listed by Clausen [1973b] and Hensen [1959]. Jelitto & Schacht [1990] and Trehane [1989] also list cultivars.
Tropaeolum  A list of cultivars of the common nasturtium is Kelsey & Dayton [1942] but without dates of introduction.
Tsuga  See conifers.


Variegated plants  The only work on cultivars of variegated plants is Yokoi
& Hirose (1978). While the text is in Japanese, plant names are in English.

**Veronica** The history and performance of cultivars of *Veronica* are discussed by Clausen (1971). Jelitto & Schacht (1990) and Trehane (1989) also list the cultivars of *Veronica*.


**Viola** Jelitto & Schacht (1990) and Trehane (1989) list the cultivars of *Viola*. The history and performance of the cultivars of *Viola cornuta* L., the viola, are discussed by Clausen (1969) and the Royal Horticultural Society (1912, 1913a). The cultivars of violets are treated comprehensively by Coombs (1981). Cultivars of pansies, violas, and violettas are listed by Fuller (1990) without dates or introducers.


**Zephyranthes** The cultivars of the rain lilies are listed by Anonymous (1958e).

**Zinnia** The modern cultivars of *Zinnia* are listed, with some history, by Sharma & Metcalf (1968).

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A Literary Trilogy
Completed

Robert E. Cook, Director

In the summer of 1840, William Henry Channing became close friends with the transcendentalist Margaret Fuller, disciple of Ralph Waldo Emerson and editor of the transcendental journal, Dial. Channing later wrote of one visit with her:

"It was a radiant and refreshing morning. . . . She proposed a walk in the open air. She led the way to Bussey’s wood, her favorite retreat during the past year, where she had thought and read, or talked with intimate friends. We climbed the rocky path, resting a moment or two at every pretty point, till, reaching a moss-cushioned ledge near the summit, she seated herself. For a time she was silent, entranced in delighted communion with the exquisite hue of the sky, seen through interlacing boughs and trembling leaves, and the play of shine and shadow over the wide landscape.

Thirty-two years later, Bussey’s wood became the Arnold Arboretum. It seems that Benjamin Bussey, gentleman farmer of Jamaica Plain, opened his entire estate to the community from the time he acquired the land in the early 1800s until he bequeathed it to Harvard University. In this sense, the Arboretum has been enjoyed by the public for many more years than those since its founding in 1872; the formal establishment of the institution simply recognized what was a widely appreciated but informal practice of excursions to enjoy the beauty of the setting.

*continued on page 2*
The occasion for my discovery of this fact, and of the quote from Channing above, was the recent publication of *Science in the Pleasure Ground*, the third of a trilogy of books by staff members about the scientific and cultural importance of the Arnold Arboretum. *Science in the Pleasure Ground* is skillfully authored by Ida Hay, formerly Curatorial Associate here, and it recounts in rich detail the changes in the Arboretum landscape over time and the history of the institution as expressed in those changes. The earlier two volumes, *A Reunion of Trees* by Steve Spongberg and *New England Natives* by Sheila Connor, spun narratives about the importation of exotic woody plants from the Far East into North America and about economic and horticultural uses of the native species and forests by the several cultures that have occupied the land of New England.

The publication of Ida’s book completes a magnificent project, begun over ten years ago and supported by several grants from the National Endowment for the Humanities, that has provided us with a much deeper understanding of the humanistic dimensions of the Arboretum and the critical importance of our living collection of trees to the scientific and cultural developments of the past century. I congratulate all three authors for the high quality of their work, and for the heritage they have rendered accessible to us all.

MHS Honors John H. Alexander III

The Massachusetts Horticultural Society bestowed the prestigious Jackson Dawson Medal on Arnold Arboretum propagator John H. Alexander III in recognition of his skill and thoroughness in developing and disseminating propagation techniques. Jack, whose career at the Arboretum began in 1976, is well known for his work with the Arboretum’s lilac collections and his extensive teaching as well as for his many contributions to the propagation of woody plants. He is seen here at the 1994 Honorary Medals and Awards Ceremony with, on his right, Walter M. Pile, Jr., Chairman of the MHS Board of Trustees, and Executive Director John C. Peterson.

The Jackson Dawson Medal itself honors an Arboretum propagator, master plantsman, and longtime superintendent whose forty-three-year career here began in 1873 as founder Charles S. Sargent’s first staff member.

Friends of the Arboretum Gain Free Admission to More Than 100 Arboreta & Botanical Gardens

We are pleased to announce a new benefit for Friends of the Arnold Arboretum: free admission and gift shop discounts at over one-hundred arboreta, botanical gardens, and conservatories across the United States and Canada. Among the many institutions participating in this reciprocal admission program are the Brooklyn Botanic Garden, New York Botanical Garden, the Strybing Arboretum & Botanical Gardens, Missouri Botanical Garden, Denver Botanic Gardens, and the Royal Botanic Gardens in Hamilton, Ontario.

Arboretum members also benefit from the reciprocity arrangement by receiving free admission to the Massachusetts Horticultural Society’s annual New England Spring Flower Show, taking place this year March 11 through 19.

All current Arboretum members will receive a new membership card and a complete list of participating institutions. Simply present your Arboretum membership card to take advantage of the new program. If you have questions, or would like to open or renew membership, please contact Lisa Hastings at 524-1718, ext. 145.
Hemlock Hill—The End of an Era

Peter Del Tredici, Assistant Director for Living Collections

Hemlock Hill has always occupied a special place in the history of the Arnold Arboretum as a little piece of wilderness in the heart of the big city. E. H. Wilson summarized the pride felt by Arboretum staff members in his 1925 book, America's Great Garden, "Within the hemlock grove reigns the stillness of primeval forest broken only by the babbling of the waters which wash its feet... within the limits of no other city can such a grand and inspiring bit of natural forest be found." Research published by Hugh Raup in 1935, however, made it clear that Hemlock Hill was far from being a "primeval" wilderness—it had been heavily lumbered during the late 1700s and early 1800s, and the hemlocks that dominated the landscape when the Arboretum was founded in 1872 had grown up after this logging. Regardless of its origin, however, Hemlock Hill has always had a wild feeling, very different from the rest of the Arboretum.

Unfortunately, a large portion of Hemlock Hill came crashing down during the great hurricane of September 21, 1938, when over 400 trees were blown over, mainly on the southeast slope. These included some of the largest, which dated back to at least 1780. In the two or three years following the hurricane, the hill was replanted with new hemlock seedlings to help stabilize the slopes and to restore the forest, with Donald Wyman bleakly predicting that "It will take the better part of a century before the magnificent grove of Hemlock Hill will again approach its perfection of September 1938."

By the time I started working at the Arboretum in 1979, however, Hemlock Hill had once again achieved the feeling of a wild forest, with a few old specimens interspersed among a mass of much younger trees. Seedling regeneration has always been virtually nonexistent on the hill, a function of the dense shade that hemlocks cast, of their highly absorptive root systems, and of the heavy foot traffic that parades up and down the slopes. Periodic storms and hurricanes since 1938 have continued their relentless program of tree removal, culling specimens with rotten cores or weak roots. This combination of ongoing mortality and lack of seedling recruitment has been a source of concern for the staff for many years, with no obvious solution in sight.

The big nor'easter that struck Boston on December 24, 1994, was yet another reminder that the problem of Hemlock Hill will get worse before it gets better. Two of the biggest trees left on the top of the hill were blown down. Both were there before the Arboretum was founded, and both were totally hollow at the base. One of the trees, approximately 80 centimeters in diameter, had 125 rings at 15 feet above the ground, suggesting an age of at least 150 years. The other tree was over 90 centimeters in diameter and appeared to be of about the same vintage. Along with these two giants, five smaller trees, probably planted after the hurricane of 1938, also came down.

From a management point of view Hemlock Hill has always been problematic. On the one hand, it receives minimal maintenance because we like to think of it as a "natural" area. On the other, it is heavily trafficked, and erosion and vandalism (mainly fires) can become very serious problems if not treated or prevented. And just to make matters worse, a new pest, the hemlock woolly adelgid, has recently been found on Arboretum property. This insect, whose arrival had been anticipated for several years, has devastated hemlock populations, both wild and cultivated, throughout the mid-Atlantic region. More recently, the insect has been spotted in hemlock forests throughout southern New England.

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While the pest can be controlled by spraying dormant oil, it is difficult, if not impossible, to control its spread in dense stands of tall trees. Only the Chinese species, *Tsuga chinen.ru*, appears to be fully resistant to damage from the adelgid.

These factors have led the Living Collections Committee to revise its management program for Hemlock Hill. The first change has been to allow as much organic matter as possible to remain on the hill in an attempt to encourage natural seedling regeneration. This translates into a policy that calls for chipping up the branches of the tree (thereby minimizing the fire hazard) and leaving the trunks where they fall to act as “nurse” logs. The second step will be to plant open areas with *Tsuga chinen.ru* in an effort to head off total devastation by the adelgid. This species is rarely cultivated in North America. While we have a few old specimens at the Arnold Arboretum, we have begun assembling specimens from various parts of its natural range. With a little luck they will be ready to plant out in three or four years.

**Mercer Fellow**

Lisa Curran has been granted a two-year Mercer Fellowship to work with the Arboretum's Indonesian Biodiversity Collections project. Since receiving her undergraduate degree from Harvard University in 1984, Lisa has been investigating the ecology, use, and management of tropical forests in Kalimantan (Indonesian Borneo). She assisted the Indonesian government with biodiversity surveys and research programs in two forest reserves that were later upgraded to national park status. She also conducted a number of field courses in tropical botany while in Kalimantan, and on several occasions served as a forestry consultant to the government of Indonesia. In field surveys and investigations of over seventy Kalimantan timber concessions and affiliated wood-based industries, she evaluated the ecological, economic, and social impact of government policies and timber company practices on forest resources and local village communities.

In July 1994, Lisa received her Ph.D. from the Department of Ecology and Evolutionary Biology at Princeton University with a thesis entitled “The ecology and evolution of mast-fruiting in Bornean Dipterocarpaceae: A general ectomycorrhizal theory.” It was based on her eight-year study of the reproductive biology and regeneration of the prominent family of Southeast Asian commercial timber trees and their insect and vertebrate seed predators. Her current research interests center on the impact of forest policies and practices on biodiversity in tropical canopy trees and the effects of seedling recruitment fluctuations on the maintenance of species diversity.

**Lichens: Fine Details of the Natural Landscape**

Lichens—actually symbiotic associations between fungi and algae or cyanobacteria—are among the most ubiquitous forms of life across the globe. From February 21 to May 15, the Arboretum will present a photographic exhibit that explores the natural history of this fascinating group of organisms. “Lichens: Fine Details of the Natural Landscape” will be available for viewing in the Arboretum's Hunnewell Building at 125 Arborway in Jamaica Plain.

The Arboretum will also offer a free lecture, “Lichens, a Special Biological Interaction,” by Donald H. Pfister, Asa Gray Professor of Systematic Botany, Harvard University. The lecture will be held on Tuesday, April 4, at 7:30 pm in the Hunnewell Building. To register, please call 617/524-1718 ext.162.
What Is Landscape? ...“A piece of land which is old or has nature” ...“How the land works” ...“What you can see through your eyes”

Richard Schulhof, Assistant Director for Education and Public Affairs

Over one hundred 6th-grade students at the Doherty Middle School in Andover ventured a response to the key question addressed in the new Arboretum program, Junior Parkmakers: What is landscape? Supported by grants from the National Endowment for the Arts and the National Park Foundation, the Arboretum and the Olmsted National Historic Site are working together to introduce Boston-area children to the concepts of landscape and landscape history. Development of the program began this past fall with focus groups comprised of local teachers and museum educators.

Mary Chmielecki, a teacher at the Doherty School, tested the power of the word landscape with her students. She asked them to define their idea of it in one sentence and then to draw it. Their responses underscored the word’s ability to evoke a wide range of personal interpretations. Although the highly varied responses made categorization difficult, roughly 25 percent thought of it as a verb (“making the lands look better”), 30 percent interpreted it as a natural or aesthetically pleasing place (“beautiful, fresh-looking scenery”), and 40 percent as a quantity or unit of land (“land for about a mile”). While all of the participants included trees in their drawings, a few children described landscape as construction sites or areas for dumping and included bulldozers or abandoned cars in their drawings.

These descriptions provide an extremely useful snapshot of the diverse perspectives that participants will bring to the program. We extend our many thanks to Ms. Chmielecki and her students for their creative and enlightening contribution. Junior Parkmakers will be field-tested later this year; it will include classroom activities and visits to the Arboretum designed to connect kids with Boston’s rich heritage of historic and designed landscapes.
Understanding Urban Trees: Getting to the Root of the Matter

Kim E. Tripp, Putnam Fellow

Trees in cities have much to contend with. Restricted rooting areas, high winds, severe temperature fluctuations, extremes of drought and flooding, compacted or contaminated soils with high concentrations of salt, and repeated mechanical damage affect the tree’s ability to maintain actively growing and functional roots. Moreover, they must cope with these extreme conditions immediately following one of the most stressful perturbations that managed woody plants are subjected to, namely, transplanting. No tree in nature is subjected to this kind of disturbance—seedling trees may be chewed on, crushed by fallen limbs, stepped on, or attacked by disease, but they are not uprooted to be replanted miles away in an alien, stressful environment.

In modern horticulture, tree seed, cuttings, and young trees are brought from a range of climates around the world to nurseries where they are grown with nearly optimal fertilization and irrigation. In field-production nurseries, plants may lose as much as eighty to ninety percent of their root systems when they are dug for shipping to a new site. The advent of the mechanical tree spade has made it virtually impossible to transplant large trees without losing most of their mass of fine roots—those roots most important for water and nutrient uptake in support of the whole organism. This means that, once replanted, trees must be able to regrow significant masses of fine roots as quickly as possible in order to survive. That ability, which varies widely among species and even among cultivars and hybrids with shared parentage, becomes a dominant factor in determining survival.

My research project at the Arnold Arboretum addresses this issue in two ways: Which ornamental woody plants in the diverse living collections of the Arnold Arboretum have over time demonstrated good potential for surviving in stressful managed environments? And among these successful plants, are there similarities in root growth patterns that permit us to generalize about what leads to successful root development and long-term survival in stressful environments, and thereby better predict which trees might thrive in such sites?

The first question is readily answered by straightforward evaluation of the collections with reference to the invaluable records that detail source, age, and prior management. Over the past year I have had the great pleasure of discovering many interesting and unusual ornamental woody plants that show great potential for urban use. I am currently working to document optimal propagation techniques for these plants and to promote them for commercial production.

I have addressed the second question by investigating how woody plants invest in root growth relative to shoot growth. My previous work and that of others has uncovered a clear coincidence between success in environments hostile to root growth and allocation of significantly greater proportion of overall growth to roots than to other parts of the plant. This pattern holds up even among closely related plants. For example, if we grow two closely related hollies from rooted cuttings—one that performs well in stressful root environments and one that doesn’t—we find that the successful holly consistently allocates much more of its growth to its root system than to its aboveground parts. This preference for investment in root growth versus shoot growth remains consistent throughout early development from rooted cuttings, through the container-grown stage, and on through two seasons in the field.

These findings help us understand urban tree growth and development. They may also allow us to develop relatively rapid screens for successful urban plants simply by rooting cuttings and growing seedlings of untried species and cultivars. This two-fold project is a unique opportunity for me to take advantage of the great diversity and excellent documentation of the living collections at the Arnold Arboretum in service to both practical and theoretical horticulture.

A successfully rooted cutting of *Alnus japonica*, the Japanese alder.

Successful rooted cuttings of *Alnus japonica*, the Japanese alder.
Spring and summer are prime seasons for gardeners, and the Arboretum offers many short courses in horticulture and botany. Begin your gardening career with introductory courses, or improve your skills with advanced courses in horticultural techniques and plant study. A selection is shown below.

For a complete catalogue of programs and events at the Arboretum, call (617) 524-1718, ext. 162. Please note that course fees printed in boldface are for Arboretum members.

**APRIL**

**HOR 327 Starting and Running a Home Nursery**  
*John H. Alexander III, Chief Plant Propagator, Arnold Arboretum*

Are you growing so many plants that you sometimes feel you might as well be running a nursery? Would you like to sell some of the plants you produce? In this workshop for the serious amateur, your questions will be answered. Is a greenhouse required? Where should you buy supplies, stock, liners, equipment? What are the legal aspects of starting a nursery? What about irrigation? How should you inform customers of your offerings? Can you manage without a catalog? Extensive handouts are included. Bring a lunch.

Fee: $117, $134  
2 Saturdays, April 1, 8/ 9:00 am–3:30 pm (Dana Greenhouse)

**HOR 195 Successful Tree and Shrub Planting**  
*James F. Martin, Professional Arborist and Horticultural Instructor*

Establishing young trees and shrubs is an important spring gardening task for the homeowner and garden professional. Learn planting techniques that will give a new tree or shrub the best chance of survival. This course will cover decisions to be made at the time of purchase, transportation, planting hole preparation, settling the plant in, finishing touches, and maintenance. The course is appropriate for both novice and experienced gardeners as well as for horticultural professionals. Please dress for the outdoors.

Fee: $40.00, $46.00  
2 Saturdays, April 1, 8/ 9:30–noon (Case Estates)

**HOR 172 Bamboos in the Home Landscape**  
*Chris DeRosa, Owner, New England Bamboo Company*

Bamboos add movement, grace, and elegant form to your garden. Beautiful as they are, gardeners know that some bamboos can become invasive garden problems. Join Chris DeRosa, a recognized bamboo expert, to learn about the variety of hardy bamboos suitable for New England gardens, their culture and uses in the landscape.

Fee: $12, $15  
Thursday, April 6/ 7:00–8:30 pm (Case Estates)

**MAY**

**Identification of Temperate Woody Plants**  
*Arnold Arboretum Staff Members Gary Koller, Stephen Spongberg, Chris Strand, and Kim Tripp. Marcia Mitchell, Course Coordinator*

This introductory course, taught by Arnold Arboretum staff members, is designed to provide a solid foundation for the identification of woody plants hardy in New England. Students may begin the two-semester curriculum in either fall or spring.

**HOR 101 Identification of Temperate Woody Plants (Spring)** includes deciduous shrubs, small flowering trees, and the spring characteristics of larger landscape trees and conifers.

**HOR 102 Identification of Temperate Woody Plants (Fall)** includes the autumn aspect of these genera and species, and presents conifers, broadleaf evergreens, and other plants whose key characteristics are best observed in the fall and winter.

Fee: $125, $150  
7 Tuesdays, May 2, 9, 16, 23, 30, June 6, 13/ 10:00–noon (Dana Greenhouse)
New Staff at the Arboretum

Carol David brings five years of librarianship to her position as the new Library Assistant at the Horticultural Library. Her responsibilities include reference services, acquisitions, and technical services. At present ninety percent of the horticultural collection is not on HOLLIS, Harvard's online catalog. Her immediate concern will be to continue to update online access in order to accelerate research efforts. Carol is a graduate student of library science at Simmons College and comes to us from the Lucien Howe Library of Ophthalmology and Otolaryngology at Massachusetts Eye and Ear Infirmary.

Lisa M. Hastings recently joined the Arboretum as Development Officer. Her responsibilities include managing the Arboretum’s membership and annual appeal efforts and planning and organizing events related to the Arboretum’s participation in the University’s Capital Campaign. She joins us from Worcester Polytechnic Institute in Worcester where, as Director of Young Alumni Programs, she was responsible for all aspects of fundraising and program management for WPI’s young alumni constituency of seven thousand. Lisa is a longtime volunteer at the Fisher Museum of Forestry at the Harvard Forest in Petersham and at the Worcester County Horticultural Society.

1995 Winter Lecture Series: The Nature of Cities

This winter marks the third year of collaboration among the Arnold Arboretum, Olmsted National Historic Site, the Harvard Graduate School of Design, and a number of other sponsors to present a lecture series exploring our changing relationship with the American landscape and natural environment. This year’s series will discuss the future of urban open space and examine the ongoing debate about how “nature” can best be shaped and managed as an integral part of the American city.

All lectures are free and begin at 6:30 pm in the Piper Auditorium of the Harvard Graduate School of Design at 48 Quincy Street in Cambridge. The Arboretum extends its thanks to the Massachusetts Foundation for the Humanities for its support of the series.

February 9: The Future of the Garden in America—Beyond the Wilderness and the Lawn
Michael Pollan, Author of Second Nature

February 23: A Manifesto for the Charles River
Sam Bass Warner, Jr., Urban Historian

March 9: Regrounding Nature in the New City
Catherine M. Howett, Professor, School of Environmental Design, University of Georgia

March 23: Imagining the New Urban Park
Diana Balmori, Principal, Balmori Associates