ARNOLD ARBORETUM
HARVARD UNIVERSITY

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION

VOLUME XXIII
1963

PUBLISHED BY THE
ARNOLD ARBORETUM
JAMAICA PLAIN, MASSACHUSETTS

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A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 JANUARY 18, 1963 NUMBER 1

## TRIAL PLOT FOR STREET TREES

DURING the spring of 1951 a trial plot of eighty small ornamental trees was planted on the Case Estates of the Arnold Arboretum in Weston (see *Arnoldia* **16:** (3) 9–15, 1956). A few of these were not happy in their location and promptly died, or did so poorly as to warrant their removal. A few new varieties were added to the original group, but for the most part these trees have been growing there since the trial plot was first laid out. The collection has been of special interest to home owners in the suburban areas of Boston, who naturally are interested in small ornamental trees. It has also been of considerable interest to the tree wardens of various towns throughout New England, for here one may see many of the best small trees growing side by side, so that comparisons can be easily made.

Recently this plot has been of interest to the Electric Council of New England, a group of utility companies which provide various electric services for the public in addition to stringing electric lines for these services. When the right kinds of trees are planted properly in the right places along the streets and highways, there need be but little competition between the trees and the wires. Today these companies are employing arborists to help the public in this very type of intelligent planting. As an outgrowth of this new interest on the part of the electric companies, a booklet was published in 1960 by the Electric Council of New England. This is entitled, "Trees in Your Community," and 150,000 copies have already been distributed throughout the New England area. A few copies are still available and may be obtained from the local member electric companies of the Electric Council of New England.

While the booklet was in process of preparation the Arnold Arboretum was asked to make suggestions as to the trees which should appear in the final list. After the booklet was published and widely distributed, Mr. George Wignot of the Boston Edison Company requested the Arboretum to consider the possibility of adding to our Trial Plot of Street Trees those mentioned in the booklet which

were not already growing in this plot. Stimulated by this interest on the part of the Boston Edison Company and aided in acquiring some of the trees which we did not have, we enlarged this trial plot so that with the exception of four, it now includes all of the trees recommended in the booklet. Those four will be added as soon as they can be obtained.

Some of the trees growing in this plot since 1951 are now excellent specimens; those just planted last fall need a year or two of growth to demonstrate their true worth. In any event, the following list indicates the trees now growing in the trial plot. They include all but four of those in the booklet, "Trees in Your Community," plus seventy others which have merit under certain specific conditions. Three-fourths of them are under thirty-five feet in height, excellent subjects either as ornamentals on the small lot or as street trees.

All in all, 109 species and varieties of trees are now growing in this Trial Plot. Since these are among the best deciduous trees available for ornamental planting, every home owner and tree warden might gain much information by visiting this plot at some time during the year. On page 8 of this bulletin there is a map showing the location of the Trial Plot for Street Trees, on the grounds of the Case Estates of the Arnold Arboretum in Weston. This Plot in Weston is off Wellesley Street which runs between Routes 20 and 30.

Rows are numbered from the road bordering this plot, the first numbers being at the southeast or Wellesley Street end of the rows.

* = Trees under 25 feet tall at maturity.
‡ = Trees over 35 feet tall at maturity.
× = Hybrid.

| | | *Row* | *Plant* |
|---|---|---|---|
| *Acer campestre | Hedge Maple | 6 | 2 |
| — carpinifolium | Hornbeam Maple | 5 | 11 |
| *— ginnala | Amur Maple | 2 | 1 |
| *— griseum | Paperbark Maple | 2 | 3 |
| ‡— pseudoplatanus | Sycamore Maple | 6 | 4 |
| — rufinerve | Redvein Maple | 5 | 10 |
| — tataricum | Tatarian Maple | 3 | 4 |
| *— triflorum | Threeflower Maple | 5 | 2;9 |
| *— truncatum | Purpleblow Maple | 5 | 16 |
| ‡— platanoides 'Columnare' | Columnar Norway Maple | 3 | 5 |
| ‡— rubrum 'Columnare' | Columnar Red Maple | 3 | 7 |
| ‡— platanoides 'Erectum' | Erect Norway Maple | 3 | 6 |
| ‡— platanoides 'Fassen's Black' | Fassen's Black Maple | 4 | 22 |
| *— platanoides 'Globosum' | Globe Norway Maple | 2 | 5 |
| *— saccharum 'Globosum' | Globe Sugar Maple | 2 | 6 |
| ‡— saccharum 'Temples' Upright' | Temples' Upright Maple | 3 | 8 |
| Amelanchier laevis | Allegheny Serviceberry | 3 | 18 |

**PLATE I**

Part of the Trial Plot for Street Trees on the Case Estates of the Arnold Arboretum in Weston, Mass. (See map, p. 8). One hundred and nine species and varieties are growing here.

| | | *Row* | *Plant* |
|---|---|---|---|
| Betula pendula 'Fastigiata' | Pyramidal European Birch | 3 | 14 |
| *Caragana arborescens 'Pendula' | Weeping Siberian Pea-tree | 5 | 17 |
| ‡Carpinus betulus | European Hornbeam | 6 | 6 |
| ‡— cordata | Heartleaf Hornbeam | 4 | 3 |
| ‡— japonica | Japanese Hornbeam | 4 | 4 |
| — betulus 'Fastigiata' | Pyramid European Hornbeam | 3 | 9 |
| Carpinus caroliniana 'Pyramidalis' | Pyramid American Hornbeam | 3 | 10 |
| ‡Cercidiphyllum japonicum | Katsura Tree | 3 | 11 |
| Cercis canadensis | Eastern Redbud | 2 | 11 |
| Chionanthus retusus | Chinese Fringetree | 2 | 10 |
| — virginicus | Fringetree | 2 | 9 |
| ‡Cladrastis lutea | American Yellow-wood | 6 | 5 |
| Cornus florida | Flowering Dogwood | 2 | 7 |
| *— kousa chinensis | Chinese Dogwood | 2 | 2 |
| *— mas | Cornelian Cherry | 4 | 11 |
| — florida 'Fastigiata' | Upright Flowering Dogwood | 3 | 12 |
| Crataegus crus-galli | Cockspur Thorn | 3 | 2 |
| — flava | Yellow Hawthorn | 3 | 19 |
| — lavallei | Lavalle Hawthorn | 2 | 16 |
| — monogyna inermis | Thornless Hawthorn | 5 | 3 |
| — nitida | Glossy Hawthorn | 4 | 2 |
| — phaenopyrum | Washington Hawthorn | 3 | 20 |
| — punctata | Dotted Hawthorn | 3 | 1 |
| — 'Autumn Glory' | Autumn Glory Hawthorn | 4 | 23 |
| — phaenopyrum 'Fastigiata' | Pyramidal Washington Hawthorn | 3 | 13 |
| — monogyna 'Stricta' | Pyramidal Singleseed Hawthorn | 3 | 3 |
| *Elaeagnus angustifolia | Russian Olive | 4; 5 | 21; 21 |
| *Evodia daniellii | Korean Evodia | 4 | 5 |
| ‡Fraxinus ornus | Flowering Ash | 6 | 4 |
| ‡Ginkgo biloba 'Fastigiata' | Sentry Ginkgo | 3 | 15 |
| ‡Gleditsia triacanthos inermis | Thornless Honey-locust | 6 | 17 |
| *— — 'Elegantissima' | Bushy Honey-locust | 5 | 7 |
| Halesia carolina | Carolina Silverbell | 2 | 12 |
| ‡— monticola rosea | Pink Mountain Silverbell | 5 | 13 |
| Koelreuteria paniculata | Golden-rain Tree | 4 | 18 |
| Laburnum alpinum | Scotch Laburnum | 2 | 14 |
| — anagyroides semperflorens | Autumn Goldenchain | 2 | 15 |
| ‡Magnolia loebneri | Loebner Magnolia | 4 | 10 |
| *Malus arnoldiana | Arnold Crab Apple | 1 | 5 |

**PLATE II**

Pin Oak (on the right of this road) used as a street tree along the Veterans of Foreign Wars Parkway near the Arnold Arboretum.

| | | Row | Plant |
|---|---|---|---|
| *Malus prunifolia rinki | Chinese Pearleaf Crab Apple | 1 | 9 |
| ‡— pumila niedzwetzkyana | Redvein Crab Apple | 1 | 14 |
| ×*— purpurea | Purple Crab Apple | 1 | 7 |
| ×*— robusta | Cherry Crab Apple | 1 | 15 |
| ×*— 'Almey' | Almey Crab Apple | 1 | 13 |
| ×*— 'Case Seedling' | Case Seedling Crab Apple | 1 | 11 |
| ×*— 'Crimson Brilliant' | Crimson Brilliant Crab Apple | 1 | 12 |
| ×*— 'Dolgo' | Dolgo Crab Apple | 1 | 6 |
| *— purpurea 'Eleyi' | Eley Crab Apple | 1 | 8 |
| ×*— 'Hopa' | Hopa Crab Apple | 1 | 16 |
| ×*— 'Jay Darling' | Jay Darling Crab Apple | 1 | 10 |
| ×*— 'Katherine' | Katherine Crab Apple | 1 | 3 |
| *— purpurea 'Lemoinei' | Lemoine Purple Crab Apple | 1 | 4 |
| ×*— 'Pink Weeper' | Pink Weeper Crab Apple | 1 | 2 |
| ×*— 'Oekonomierat Echtermeyer' | | 1 | 1 |
| ‡Nyssa sylvatica | Black Tupelo | 6 | 9 |
| ‡Ostrya virginiana | Hop Hornbeam | 5 | 20 |
| ‡Oxydendrum arboreum | Sourwood | 6 | 1 |
| ‡Phellodendron amurense | Amur Cork Tree | 6 | 14 |
| ×‡Platanus acerifolia | London Plane Tree | 6 | 8 |
| ‡Prunus sargentii | Sargent Cherry | 5 | 4 |
| — subhirtella autumnalis | Autumn Higan Cherry | 6 | 16 |
| *— serrulata 'Amanogawa' | Amanogawa Oriental Cherry | 5 | 8 |
| *— cerasifera 'Atropurpurea Veitchii' | Veitch Pissard Plum | 4 | 20 |
| *— serrulata 'Botan Zakura' | Botan Zakura Oriental Cherry | 4 | 7 |
| — sargentii 'Columnaris' | Columnar Sargent Cherry | 3 | 16 |
| *— serrulata 'Joi Nioi' | Joi Nioi Oriental Cherry | 4 | 8 |
| *— — 'Kwanzan' | Kwanzan Oriental Cherry | 5 | 6 |
| *— — 'Ojochin' | Ojochin Oriental Cherry | 5 | 12 |
| *— virginiana 'Shubert' | Shubert Chokecherry | 5 | 5 |
| ‡Quercus palustris | Pin Oak | 6 | 11 |
| ‡— robur 'Fastigiata' | Pyramidal English Oak | 3 | 17 |
| *Rhamnus koraiensis | Korean Buckthorn | 4 | 17 |
| ‡Sophora japonica | Japanese Pagoda Tree | 6 | 10 |
| ‡Sorbus alnifolia | Korean Mountain-ash | 4 | 1 |
| — arnoldiana | Arnold Mountain-ash | 4 | 16 |
| ‡— aucuparia | European Mountain-ash | 5 | 18 |
| ‡— — asplenifolia | Cutleaf European Mountain-ash | 2 | 8 |
| — discolor | Snowberry Mountain-ash | 5 | 19 |
| *— folgneri | Folgner Mountain-ash | 2 | 13 |

| | | *Row* | *Plant* |
|---|---|---|---|
| Sorbus aucuparia 'Fastigiata' | Upright European Mountain-ash | 4; 5 | 15; 14 |
| *— decora 'Nana' | Dwarf Showy Mountain-ash | 5 | 1 |
| ‡Stewartia koreana | Korean Stewartia | 4 | 12 |
| Syringa amurensis | Amur Lilac | 2 | 4 |
| ‡Tilia cordata | Little-leaf Linden | 6 | 12 |
| ×‡— euchlora | Crimean Linden | 6 | 13 |
| — americana 'Fastigiata' | Upright American Linden | 4 | 6 |
| ‡Ulmus parvifolia | Chinese Elm | 4 | 13 |
| ‡— americana 'Augustine' | Augustine Elm | 4 | 19 |
| *Viburnum prunifolium | Blackhaw | 4 | 14 |
| — rufidulum | Southern Blackhaw | 4 | 9 |
| ‡Zelkova serrata | Japanese Zelkova | 6 | 18 |

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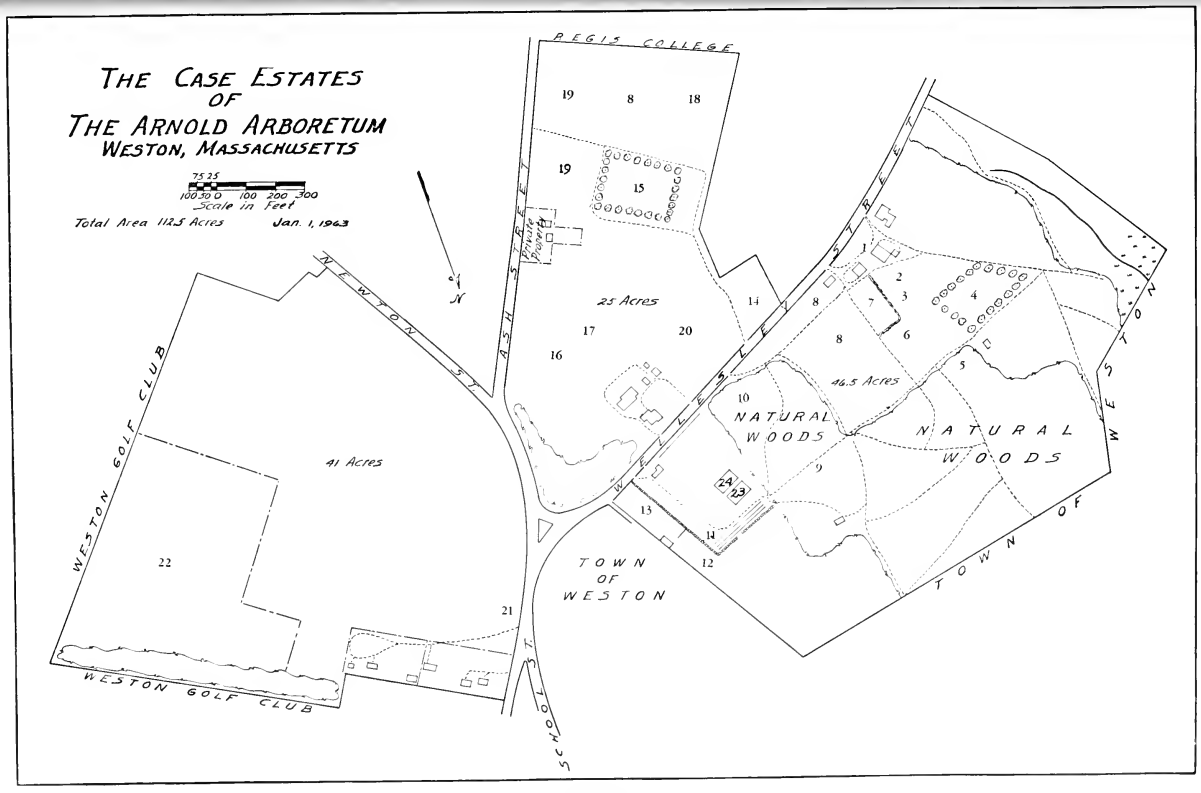


**PLATE III**

1 Barn, 135 Wellesley St. 2 Cold Frames. 3 Young Plant House. 4 Malus sikkimensis Orchard. 5 Holly Collection. 6 Evergreen Nursery. 7 Ericaceous Nursery. 8 Nursery. 9 Woods Path. 10 Rhododendrons. 11 Vine Trellis. 12 Trial Plot for Street Trees. 13 Ground Cover Plots. 14 Perennial and Small Shrub Garden. 15 Orchard. 16 Beach Plum Collection. 17 Dwarf Fruit Trees. 18 Permanent Barberry and Currant Collection. 19 Permanent Shrub Testing Plot. 20 Shrub Experimental Plot. 21 Oriental Crab Apples. 22 Cabot Foundation Experimental Plot. 23 Daffodil Trial Plots (in cooperation with the New England Daffodil Society). 24 Lily Trial Plots (in cooperation with the New England Regional Lily group).

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VOLUME 23 FEBRUARY 22, 1963 NUMBER 2

## RESULTS OF TRIALS IN THE GROUND COVER DEMONSTRATION PLOTS

THE Ground Cover Demonstration Plots on the Arnold Arboretum's Case Estates in Weston, Massachusetts, were first laid out in 1950. Then, only about fifty different kinds of plants were tried, but as time went on, there was so much interest shown in these plantings that they were increased considerably. New ones are being added every year, and unfortunately, there are always some which do not do well and die as a result of severe winters. It is impossible to publish a list that is complete for any length of time, since numerous changes are constantly being made.

There are at least 165 different kinds of plants being grown in these plots now, and most of these are listed in this bulletin according to row number and position in the row. Row 1 is nearest to the high stone wall, and the plants are numbered from the Wellesley Street end, the first plant in each row being the closest to Wellesley Street.

The plots are in an open former cow pasture, mostly in the full sun, although the first row along the taller stone wall does receive shade about half the time. Otherwise, these plants are all given approximately the same care, with only a few being covered in the winter with pine boughs.

Late fall and winter are not the best times of the year to see these plots. Rather a visit might best be made in late spring after many of the plants have made a major amount of growth and while many of them are still in flower.

This list is published now so that the arm-chair gardener who makes plans during the winter for next spring's gardening activities, can become acquainted with the fact that this demonstration plot exists and is open to the public at all times. All the plots are labeled with the common and scientific name of each plant. It is here that one might come when in doubt as to just which ground cover to select for a certain area.

## GROUND COVER DEMONSTRATION PLOTS, CASE ESTATES

(As of January 1, 1963)

h=herbaceous, usually dead above the ground every winter
e=evergreen foliage
*=these have proved good ground covers in these trials

| *Row & Plant No.* | | *Scientific Name* | *Common Name* |
|---|---|---|---|
| 4–10 | h | Achillea 'King Edward' | 'King Edward' Yarrow |
| 3–10 | h | *Aegopodium podograria | Bishop's Goutweed |
| 1–27 | h | *Aegopodium podograria 'Variegatum' | Silveredge Bishop's Goutweed |
| 4–3 | h | *Ajuga reptans | Carpet Bugle |
| 6–6 | h | *Ajuga reptans alba | White Carpet Bugle |
| 4–4 | h | Ajuga reptans 'Variegata' | Variegated Carpet Bugle |
| 4–2 | h | Ajuga genevensis rosea | Geneva Bugle |
| 3–18 | | *Akebia quinata | Five-leaf Akebia |
| 3–12 | h | Allium senescens glaucum | Variety of Onion |
| 4–9 | | Alyssum petraeum | Goldentuft Alyssum |
| 4–5 | e | Arabis alpina | Alpine Rockcress |
| 3–6 | e | *Arctostaphylos uva-ursi | Bearberry |
| 3–16 | e | Arenaria stricta | Rock Sandwort |
| 4–22 | e | *Armeria arctica | Arctic Thrift |
| 7–14 | | *Aronia melanocarpa | Black Chokeberry |
| 5–11 | h | Artemisia 'Gray Mound' | Sagebrush 'Gray Mound' |
| 2–10 | | Artemisia purshiana | Pursh Sagebrush |
| 2–25 | | Artemisia stelleriana | Beach Wormwood, Dusty Miller |
| 1–11 | e | *Asarum caudatum | British Columbia Wild Ginger |
| 1–12 | e | *Asarum europaeum | European Wild Ginger |
| 6–2 | h | Astilbe japonica | Japanese Astilbe |
| 1–16 | h | Athyrium filix-femina | Lady Fern |
| 2–6 | e | *Calluna vulgaris | Scotch Heather |
| 4–1 | h | Campanula rotundifolia | Bluebell |
| 6–21 | e | *Cerastium tomentosum | Snow-in-Summer |
| 7–24 | | Chaenomeles japonica 'Sargentii' | Sargent Japanese Quince |
| 1–13 | h | *Convallaria majalis | Lily-of-the-Valley |
| 2–17 | h | *Coreopsis auriculata 'Nana' | Dwarf Eared Coreopsis |
| 6–1 | | Cornus stolonifera 'Kelseyi' | Kelsey Dwarf Red Osier |
| 5–1 | | *Cotoneaster adpressa | Creeping Cotoneaster |
| 6–22 | | *Cotoneaster adpressa praecox | Early Creeping Cotoneaster |
| 5–2 | | Cotoneaster apiculata | Cranberry Cotoneaster |
| 4–17 | | *Cotoneaster horizontalis | Rock Cotoneaster |
| 7–22 | | *Cotoneaster horizontalis | Rock Cotoneaster |
| 4–16 | | Cotoneaster microphylla cochleata | Prostrate Small-leaved Cotoneaster |
| 6–23 | | Cotoneaster microphylla | Small-leaved Cotoneaster |
| 5–10 | | Cytisus decumbens | Prostrate Broom |
| 5–4 | | Cytisus purpureus | Purple Broom |

| *Row & Plant No.* | | *Scientific Name* | *Common Name* |
|---|---|---|---|
| 2–18 | e | Daphne cneorum | Rose Daphne |
| 3–13 | h | Dianthus deltoides | Maiden Pink |
| 6–11 | e | *Dianthus gratianopolitanus | Cheddar Pink |
| 3–15 | h | Dicentra eximia | Fringed Bleedingheart |
| 7–5 | | Diervilla lonicera | Dwarf Bush Honeysuckle |
| 7–6 | | Diervilla rivularis | Georgia Bush Honeysuckle |
| 7–7 | | Diervilla sessilifolia | Southern Bush Honeysuckle |
| 5–13 | h | Draba sibirica | Siberian Draba |
| 2–14 | h | Duchesnea indica | Mock Strawberry |
| 2–12 | e | Epigaea repens | Trailing Arbutus |
| 1–7 | h | *Epimedium grandiflorum | Longspur Epimedium |
| 2–5 | e | *Erica carnea | Spring Heath |
| 6–12 | | Erigeron simplex | |
| 4–14 | e | *Euonymus fortunei 'Colorata' | Purpleleaf Wintercreeper |
| 4–11 | e | Euonymus fortunei 'Gracilis' | Silveredge Wintercreeper |
| 4–13 | e | Euonymus fortunei 'Minima' | Baby Wintercreeper |
| 3–14 | e | Euonymus fortunei radicans | Common Wintercreeper |
| 7–23 | e | Euonymus fortunei vegeta | Bigleaf Wintercreeper |
| 4–15 | | Euonymus obovata | Running Euonymus |
| 6–14 | h | *Euphorbia cyparissias | Cypress Euphorbia |
| 5–20 | e | *Festuca glauca | Blue Fescue |
| 3–24 | h | Filipendula hexapetala flore-pleno | Double Dropwort |
| 7–3 | | *Forsythia 'Arnold Dwarf' | |
| 1–14 | e | *Galax aphylla | Galax |
| 6–9 | h | *Galium mollugo | White Bedstraw |
| 3–3 | h | Galium verum | Yellow Bedstraw |
| 1–17 | e | Gaultheria procumbens | Checkerberry, Wintergreen |
| 4–7 | e | *Gaylussacia brachycera | Box Huckleberry |
| 3–1 | | Genista pilosa | Silky-leaf Woadwaxen |
| 1–23 | h | Geranium sanguineum | Blood Red Geranium |
| 2–15 | h | *Gypsophila repens 'Rosea' | Rosy Creeping Gypsophila |
| 3–21 | e | Hedera helix | English Ivy |
| 3–19 | e | *Hedera helix baltica | Baltic Ivy |
| 3–20 | e | Hedera helix 'Rumania' | Rumanian Ivy |
| 5–14 | e | Helianthemum nummularium | Sunrose |
| 6–4 | h | Hemerocallis fulva 'Kwanso' | Daylily 'Kwanso' |
| 3–7 | e | *Herniaria glabra | Common Burstwort |
| 5–19 | e | Heuchera sanguinea | Coral Bells |
| 1–8 | h | *Hosta decorata | Blunt Plantain-lily |
| 1–2 | h | *Hosta lancifolia | Narrow-leafed Plantain-lily |
| 1–1 | h | *Hosta lancifolia 'Albo-marginata' | Variegated Blue Plantain-lily |
| 1–6 | h | *Hosta undulata | Wavyleaf Plantain-lily |
| 1–5 | h | *Hosta undulata 'Univittata' | Wavyleaf Plantain-lily |

| *Row & Plant No.* | | *Scientific Name* | *Common Name* |
|---|---|---|---|
| 1–15 | | Hydrangea petiolaris | Climbing Hydrangea |
| 2–7 | | Hypericum buckleyi | Blueridge St. Johnswort |
| 3–9 | h | Hyssopus officinalis rubra | Red Hyssop |
| 3–22 | e | Iberis gibraltarica | Gibraltar Candytuft |
| 3–23 | e | Iberis sempervirens | Evergreen Candytuft |
| 7–13 | | *Indigofera incarnata alba | White Chinese Indigo |
| 7–8 | | *Indigofera kirilowii | Kirilow Indigo |
| 4–23 | h | Iris cristata | Crested Iris |
| 5–6 | e | *Juniperus chinensis sargentii | Sargent Juniper |
| 5–3 | e | *Juniperus horizontalis | Creeping Juniper |
| 5–5 | e | *Juniperus horizontalis douglasii | Waukegan Juniper |
| 4–24 | e | *Juniperus horizontalis douglasii | Waukegan Juniper |
| 6–7 | e | Juniperus horizontalis glomerata | Flat Creeping Juniper |
| 5–7 | e | *Juniperus horizontalis plumosa | Andorra Juniper |
| 5–16 | e | Juniperus procumbens | |
| 5–24 | e | Juniperus sabina tamariscifolia | Tamarix Savin Juniper |
| 1–19 | h | Lamium galeobdolon | Archangel Deadnettle |
| 3–8 | e | Lavandula officinalis 'Nana' | Dwarf Lavender |
| 3–17 | e | *Leucothoe catesbaei | Drooping Leucothoe |
| 2–13 | e | Liriope spicata | Creeping Liriope |
| 7–2 | e | *Lonicera henryi | Henry Honeysuckle |
| 5–9 | | *Lonicera japonica aureo-reticulata | Yellownet Japanese Honeysuckle |
| 7–11 | | *Lonicera japonica halliana | Hall's Honeysuckle |
| 5–8 | | *Lonicera japonica repens | Variety of Japanese Honeysuckle |
| 5–12 | | Lonicera prostrata | Creeping Honeysuckle |
| 2–16 | | Lysimachia nummularia | Moneywort |
| 6–13 | e | *Mahonia aquifolium | Oregon Holly-grape |
| 3–11 | | Mentha gentilis | Red Mint |
| 7–25 | | Myrica pensylvanica | Bayberry |
| 1–21 | h | *Nepeta hederacea | Ground Ivy |
| 2–8 | h | Nepeta mussini | Persian Nepeta |
| 3–5 | e | *Pachistima canbyi | Canby Pachistima |
| 1–4 | h | Pachysandra procumbens | Alleghany Pachysandra |
| 1–3 | e | *Pachysandra terminalis | Japanese Pachysandra |
| 1–25 | e | *Pachysandra terminalis 'Variegata' | Variegated Japanese Pachysandra |
| 1–26 | | Parthenocissus quinquefolia 'St. Paulii' | St. Paul Virginia Creeper |
| 4–25 | h | *Phalaris arundinacea picta | Ribbon Grass |
| 4–20 | h | Phlox stolonifera | Creeping Phlox |
| 5–15 | h | Phlox subulata alba | White Moss Phlox |
| 4–18 | h | Phlox subulata 'Crimson Beauty' | Moss Phlox 'Crimson Beauty' |

| *Row & Plant No.* | | *Scientific Name* | *Common Name* |
|---|---|---|---|
| 4–19 | h | Phlox subulata 'Emerald Cushion' | Moss Phlox' Emerald Cushion' |
| 7–1 | h | *Pleioblastus distichus | Fern Bamboo |
| 7–15 | h | *Pleioblastus variegatus | Variegated Bamboo |
| 4–21 | | Polemonium reptans | Creeping Polemonium |
| 6–3 | h | *Polygonum affine | Himalayan Fleeceflower |
| 3–25 | | *Polygonum bistorta | European Bistort, Snakeweed |
| 1–28 | h | *Polygonum cuspidatum compactum | Dwarf Polygonum |
| 4–12 | e | *Potentilla tridentata | Wineleaf Cinquefoil |
| 2–2 | h | Primula polyantha | Polyantha Primrose |
| 6–16 | h | Prunella grandiflora rosea | Pink Bigflower Selfheal |
| 6–15 | h | Ranunculus repens | Creeping Buttercup |
| 7–12 | | *Rhus aromatica serotina | Late Fragrant Sumac |
| 5–17 | | Rosa 'Max Graf' | Rose 'Max Graf' |
| 5–18 | | Rosa paulii | Paul's Rose |
| 7–9 | | *Rosa wichuraiana | Memorial Rose |
| 3–4 | | Rubus laciniatus | Cutleaf Blackberry |
| 2–4 | e | Sagina subulata | Corsican Pearlwort |
| 7–10 | | Salix tristis | Dwarf Pussy Willow |
| 4–8 | e | Santolina chamaecyparissus | Cypress Lavender-cotton |
| 2–11 | h | Satureja alpina | Alpine Calamint |
| 2–24 | e | Sedum acre | Goldmoss Stonecrop |
| 2–22 | e | Sedum album | White Stonecrop |
| 2–21 | e | Sedum album roseum | |
| 2–20 | | Sedum ellacombianum | |
| 5–22 | e | *Sedum spurium | Two-row Stonecrop |
| 6–17 | e | *Sempervivum tectorum | Hens and Chickens |
| 5–23 | | *Stephanandra incisa 'Crispa' | Dwarf Cutleaf Stephanandra |
| 2–19 | | Symphoricarpos 'Hancock' | |
| 6–18 | h | Tanacetum vulgare 'Alatanz' | Variety of Tansy |
| 1–10 | | Teucrium chamaedrys 'Prostratum' | Dwarf Chamaedrys Germander |
| 6–10 | h | Thymus lanicaulis | Woolly-stem Thyme |
| 2–3 | e | *Thymus lanuginosis | Woolly-Mother-of-Thyme |
| 1–24 | e | Thymus serpyllum roseum | Rose Mother-of-Thyme |
| 2–9 | e | *Tiarella cordifolia | Alleghany Foamflower |
| 1–18 | | Vaccinium angustifolium laevifolium | Smooth-leaf Lowbush Blueberry |
| 1–22 | e | *Vaccinium vitis-idaea | Shore Cowberry |
| 6–20 | h | *Vancouveria hexandra | American Barrenwort |
| 2–1 | h | Veronica incana | Woolly Speedwell |
| 5–21 | e | Veronica chamaedrys | Germander Speedwell |
| 5–5 | h | Veronica prostrata | Prostrate Speedwell |
| 4–6 | e | *Vinca minor | Common Periwinkle |
| 6–24 | e | *Vinca minor 'Aureo-variegata' | Yellow-blotch Periwinkle |

| *Row & Plant No.* | | *Scientific Name* | *Common Name* |
|---|---|---|---|
| 1–9 | e | Vinca minor 'Multiplex' | Purple Double Periwinkle |
| 6–8 | h | Viola sp. | Violet |
| 1–20 | h | Viola 'Confederate' | |
| 7–4 | | *Xanthorhiza simplicissima | Yellow Root |

**Unsatisfactory Ground Covers**

(These have not proved successful in the Trial Plots of the Arnold Arboretum at the Case Estates during the last ten years.)

Acaena buchananii – died the second year.

Ajuga genevensis rosea – beautiful in flower, but does not spread well.

Ajuga reptans 'Variegata' – exeellent for 2–3 years; then the species seeds in and must be removed by hand.

Alyssum saxatile – poor as ground cover.

Arabis alpina – must be replaced every few years.

Arenaria montana – dead 1960.

Arenaria stricta – poor, clump-like growth.

Arenaria maritima – 1951 – died out before 1962.

Armeria montana – does not spread well, plants show dead spots in center after a few years.

Artemisia stelleriana – too coarse in texture.

Asperula hirta – removed after one year, poor as a ground cover.

Asperula odorata – died in 3 years. Situation too dry and hot.

Athyrium filix-femina – only satisfactory in shade and moist soil.

Aubretia deltoides hendersonii – died in 2 years.

Campanula carpatica – planting must be replaced frequently.

Carex morrowii – not completely hardy.

Ceratostigma plumbaginoides – starts growth very late in the spring.

Coronilla varia – eventually died.

Corydalis lutea – could not become properly established.

Cotoneaster humifusa (dammeri) – not reliably hardy.

Cytisus decumbens – has not proved a vigorous spreader under our conditions.

Cytisus purpureus – ungainly.

Dianthus deltoides – grass easily seeds between plants.

Dianthus plumarius – grass easily seeds between plants.

Dicentra eximia – does not spread satisfactorily.

Draba sibirica – must be replanted every 3 years.

Duchesnea indica – large spots die every other year.

Euonymus fortunei radicans – very susceptible to scale.

Euonymus fortunei 'Kewensis' – very susceptible to scale, not for large areas.

Euonymus fortunei 'Minima' – very susceptible to scale, not for large areas.

Euonymus fortunei 'Silver Queen' – spreads very little; individual plants die.

Euonymus obovatus – untidy appearance.

Filipendula hexapetala flore-pleno – does not spread satisfactorily.

Fragaria vesca americana – dies every few years in this location.

Gaultheria procumbens – only satisfactory in moist acid soil in shade.

Gaultheria shallon – not hardy.

Geranium sanguineum – good only in moist soil and shade.

Genista tinctoria plena – muat be replaced frequently.

Helianthemum nummularium – not reliably hardy.

Heuchera sanguinea – does not spread satisfactorily.

Hypericum buckleyi – makes an excellent mat-like growth, but does not root readily; hence spot killing occurs if ice settles on it in winter for long periods.

Hypericum calycinum – not hardy.

Hypericum repens – not hardy.

Hyssopus officinalis – poor growth.

Iberis – several species showed ungainly growth, making poor ground covers.

Iris cristata – excellent until iris borer takes its toll.

Lamium maculatum – dies after a few years.

Lavendula officinalis 'Nana' – grows in clumps.

Leiophyllum buxifolium – does not spread well.

Liriope spicata – excellent until grass seeds in after 3–4 years.

Lysimachia nummularia – excellent until grass seeds in after 3–4 years.

Mazus reptans – parts die periodically.

Mentha piperita – too ungainly for a neat groundcover.

Mitchella repans – not for dry soils in full sun.

Nepeta hederacea variegata – requires full shade and moisture.

Nepeta mussinii – too coarse.

Pachysandra procumbens – grows in slowly expanding clumps.

Parthenocissus quinquefolia – ungainly.

Phlox divaricata canadensis – died within 5 years.

Phlox stolonifera – replaced in ten years.

Phlox subulata – satisfactory for 3–4 years or until grass seeds in.

Polemonium reptans – has always performed poorly.

Primula polyanthus – requires shade and moisture.

Prunella grandiflora – dead in 4 years.

Prunella vulgaris – dead in 5 years.

Pulmonaria officinalis – dies repeatedly.

Ranunculus repens – double-flowered variety is not sufficiently vigorous. The single-flowered species might be satisfactory.

Rosa 'Max Graf' – too coarse in growth.

Rosa Paulii – too coarse in growth.

Rubus laciniatus – too coarse in growth.

Santolina chamaecyparissus – not reliably hardy.

Saponaria ocymoides – not satisfactory.

Sarcocca hookeriana – not reliably hardy.

Satureja alpina – poor growth in 3 years.

Satureja montana – poor under existing conditions.

Saxifraga marginata – died within 2 years.

Stachys olympica – died within 1 year.

Teucrium chamaedrys – growth and hardiness are erratic.

Teucrium chamaedrys 'Prostrata' – grows in clumps, does not spread.

Thymus serpyllum – good for small spots only, not large areas.

Tussilago farfara – very poor as a ground cover, since it dies to ground by summer. Our planting eventually died completely after about 10 years.

Veronica chamaedrys – clump-like growth.

Veronica filiformis – died within 2 years.

Veronica officinalis – has not performed satisfactorily under our conditions.

Vinca minor 'Multiplex' – a weak grower.

Viola 'Jersey Gem' – died within 2 years.

DONALD WYMAN

# ARNOLDIA

A continuation of the
Bulletin of Popular Information
of the Arnold Arboretum, Harvard University

Volume 23 APRIL 5, 1963 Number 3

## CULTIVARS IN THE GENUS CHAENOMELES

Claude Weber

The genus Chaenomeles includes the plants commonly known as Japanese or Flowering Quinces, or Japonicas. They are shrubs with bright and showy flowers, blooming normally in the early spring, before the leaves come out, at a time when few other flowers are available in the garden. For this reason, the Flowering Quinces have been popular ever since the first species was introduced to European gardens at the end of the eighteenth century.

Before its introduction into Europe, the botanist Thunberg had seen a Flowering Quince growing in Japan. He thought it was a new kind of pear tree, and described it, in 1784, as *Pyrus japonica*. A few years later, in 1796, Sir Joseph Banks, director of the Royal Botanic Gardens, Kew, introduced the first Japanese Quince into England, assuming it was Thunberg's species. In 1807, Persoon recognized that because of its numerous seeds this species did not belong to the genus *Pyrus*, but rather to *Cydonia*, the common Quince. The plant therefore became known as *Cydonia japonica* (Thunb.) Pers.

In 1822 Lindley established the genus *Chaenomeles*, distinguishing it from *Cydonia* primarily by the character of the fruits. Subsequent observations and studies have confirmed Lindley's opinion, yet some nurserymen still continue to list the species of *Chaenomeles* under *Cydonia*. *Chaenomeles* possesses reniform stipules; short, entire, glandless sepals erect at anthesis; stamens in two rows; completely fused carpels; and styles fused at the base forming a column. *Cydonia* has linear stipules; foliaceous and serrate sepals bordered with glands; stamens in one row; carpels fused by the adaxial side only; and styles free or coalescent by the pubescence only.

About 1870, the Messrs. Maule, nurserymen in Bristol, England, introduced a

second species of Flowering Quince from Japan, which Masters described as *Pyrus maulei.* Years later, however, botanists discovered that this species was the real *Pyrus japonica* of Thunberg. It is a dwarf plant with small crenate leaves and flowers salmon-orange in color. Its correct name is *Chaenomeles japonica* (Thunb.) Lindl. ex Spach, and *Chaenomeles* 'Maulei' is a cultivar representing the strain introduced by the Maules into Europe.

The species which was first introduced to Europe by Banks is native in China. Banks found it in Japan where it was under cultivation. This plant is an upright shrub with serrate leaves and normally red flowers, quite different indeed from Thunberg's plant. In 1815, Loiseleur Deslongchamps became aware of the existence of two kinds of shrubs under the name of *Pyrus (Cydonia) japonica.* He proposed a new name for the Chinese plant, *Cydonia lagenaria.* Unfortunately, in his description of the species, he included Thunberg's *Pyrus japonica* as a synonym. As a result, *Cydonia lagenaria* is a superfluous name according to the International Code of Botanical Nomenclature. The correct name for what is commonly known in cultivation as *C. lagenaria* is *Chaenomeles speciosa* (Sweet) Nakai based on Sweet's *Cydonia speciosa.*

The third species included in the genus *Chaenomeles* is *C. cathayensis* (Hemsley) Schneider. Its introduction from China to Europe passed unnoticed because, like *C. japonica*, it arrived incorrectly identified. At the time of its introduction it was thought to be *Cydonia sinensis* (DuMont de Courset) Thouin. *Chaenomeles cathayensis* is a shrub with straight, erect branches with numerous strong thorns, long, serrate leaves, and white flowers suffused with pink. *Cydonia sinensis* is a tree, absolutely thornless, with round, glandular leaves and pink flowers. In 1901, when the identity of the introduction was established and it was described as *C. cathayensis*, it had been growing for some twenty years at the Royal Botanic Gardens at Kew. Research, mostly on herbarium specimens, suggested that *C. cathayensis* was only a variety of *C. speciosa.* Subsequent observations and studies of living material, however, confirmed the initial consideration that *C. cathayensis* is sufficiently distinct from *C. speciosa* to merit specific status.

*Cydonia sinensis* was transferred by Koehne to *Chaenomeles* as *C. chinensis* Koehne, because he thought that the styles were fused at the base. The change in spelling of the specific epithet and the assumption that the styles are fused are incorrect. The proper position of this species, therefore, is in *Cydonia.*

The genus *Chaenomeles* now includes three species, *C. cathayensis*, *C. japonica*, and *C. speciosa.* Hybrids have been developed among them in every combination. *Chaenomeles* × *superba* (Frahm) Rehder is a chance hybrid between *C. japonica* and *C. speciosa.* This hybrid appeared naturally in different nurseries about 1898, but was considered at the time to be only a variety of *C. maulei.* The next hybrids, produced artificially, are the famous "Cathayensis Hybrids." *Chaenomeles cathayensis* × *speciosa* was raised by De Vilmorin, in France, and named *C. hybrida vedrariensis.* This is now considered to be the first cultivar in the VILMORINIANA group. W. B. Clarke, of San Jose, California, crossed *C. japonica* with *C. cathayensis.* The result of this cross gave rise to the first cultivar, 'Cynthia', in the

CLARKIANA group. Clarke also crossed *C.* × *superba* 'Corallina' with *C. cathayensis*, producing what is called the CALIFORNICA group in which all three species are involved. The genetic recombination and the segregation of characters in the first and second generation of this latter cross supply the basis for many of the cultivars developed by Clarke. Some of these hybrids have backcrossed to the parental species causing some of the confusion which makes it difficult to determine to which species or hybrid group a given cultivar belongs.

The compilation of the material which follows was begun at the Arnold Arboretum under the program of the American Association of Botanical Gardens and Arboretums, authorized by the American Horticultural Society and the International Committee of Plant Registration. At the XVIth International Horticultural Congress held in Belgium in 1962, the Arnold Arboretum was designated as the International Registration Authority for the genus *Chaenomeles*, and this list is, therefore, offered as an International Registration list of cultivars.

The lists presented in the following pages are fully explained at the beginning of each of them. It is sufficient to say here that the first comprises an alphabetical arrangement of all names which have been applied to Japanese Quinces and the species or hybrid group of which each is a member; the second is an arrangement of cultivar names under the species or hybrid group to which each belongs; and the third is a grouping of names of living cultivars by their color classes.

Further information and corrections, as well as any additions to these lists, will be greatly appreciated. I wish to express here my sincere thanks to the numerous persons who have contributed information, fresh material, or herbarium specimens. Without their whole-hearted help, the completion of this study would have been impossible.

## I. LIST OF ALL KNOWN CULTIVAR NAMES

This list is a compilation (in alphabetical order) of *all* names, which have been applied to Japanese Quince, including those illegitimate according either to the International Code of Botanical Nomenclature or to the International Code of Nomenclature for Cultivated Plants. Included also are those names still unpublished but currently in use in botanical gardens. Each cultivar name is followed by the name (in parentheses) of the species or hybrid group to which the cultivar belongs (this name is printed in SMALL CAPITALS). A question mark (?) indicates that the species or hybrid group could not be verified because of lack of material. Cultivar names which are synonyms are indicated by *italic* type in accordance with a recent ruling for registration lists. An asterisk (*) preceding a cultivar name indicates that the cultivar is currently grown in the United States and available from nurseries, botanical gardens, and arboreta. A dagger (†) preceding a cultivar name indicates that the cultivar is thought to be extinct.

'Abricot' (× SUPERBA)
* *'Afterglow'* (× SUPERBA)
* 'Afterglow' (× VILMORINIANA)
'Akebono' (?)
* 'Alarm' (SPECIOSA)
*'Alba'* (JAPONICA)

* 'Alba' (SPECIOSA)
* 'Alba' (SPECIOSA)
* 'Alba' (× SUPERBA)
* 'Alba Candida' (SPECIOSA)
* 'Alba Cincta' (SPECIOSA)
† 'Alba Cincta Plena' (prob. SPECIOSA)
* 'Alba Cintra' (SPECIOSA)
'Alba Cintra Plena' (prob. SPECIOSA)
'Alba Floribunda' (SPECIOSA)
† 'Alba Grandiflora' (SPECIOSA)
† 'Alba Grandiflora Carrieri' (SPECIOSA)
* 'Alba Grandiflora Plena' (SPECIOSA)
† 'Alba Odorans' (SPECIOSA)
† 'Alba Picta' (SPECIOSA)
* 'Alba Plena' (SPECIOSA)
* 'Alba Punctata Rosea' (SPECIOSA)
* 'Alba Rosea' (SPECIOSA)
'Alba Semiplena' (SPECIOSA)
† 'Alba Simplex' (prob. SPECIOSA)
† 'Alba Variegata' (prob. SPECIOSA)
* 'Albicans' (SPECIOSA)
* 'Albiflora' (SPECIOSA)
† 'Albipicta' (SPECIOSA)
* 'Albo-cincta' (SPECIOSA)
† 'Albo-lineata' (?)
† 'Albo-picta' (SPECIOSA)
* 'Albo-rosea' (SPECIOSA)
Var. alpina (JAPONICA)
* 'Alpina' (JAPONICA)
* 'Alpina' (JAPONICA)
* 'Alpina Naranja' (× SUPERBA)
'Andenken an Carl Ramcke' (× SUPERBA)
* 'Andenken an Ernst Finken' (× SUPERBA)
'Andenken an Karl Ramcke' (× SUPERBA)
'Angustifolia' (SPECIOSA)
* 'Apple Blossom' (SPECIOSA)
* 'Apple Blossom Pink' (SPECIOSA)
'Apricot' (× SUPERBA)
† 'Argentea' (?)
* 'Arthur Colby' (× CALIFORNICA)
* 'Arthur Hill' (JAPONICA)
† 'Atrocaulis' (?)
* 'Atrococcinea' (SPECIOSA)
* 'Atrococcinea Flore Pleno' (SPECIOSA)
* 'Atrococcinea Plena' (SPECIOSA)
† 'Atrococcinea Semi-plena' (prob. SPECIOSA)
* 'Atropurpurea' (SPECIOSA)
* 'Atrosanguinea' (SPECIOSA)
* 'Atrosanguinea' (SPECIOSA)
* 'Atrosanguinea' (× SUPERBA)
* 'Atrosanguinea Flore Plena' (SPECIOSA)
* 'Atrosanguinea Plena' (SPECIOSA)
† 'Aurantiaca' (SPECIOSA)
† 'Aurantiaca Semiplena' (SPECIOSA)
* 'Aurea' (JAPONICA)
* 'Aurea' (SPECIOSA)
* 'Aurora' (SPECIOSA)
* 'Aurora' (× CALIFORNICA)
* 'Azalea' (prob. × SUPERBA)
* 'Baltzii' (SPECIOSA)
'Benibotan' (?)
* 'Benichidori' (× SUPERBA)
* 'Blood Red' (SPECIOSA)
* 'Blush' (SPECIOSA)
* 'Blush Japan' (SPECIOSA)
* 'Bonfire' (SPECIOSA)
* 'Boule de Feu' (SPECIOSA)
* 'Boule de Feu' (× SUPERBA)
* 'Boule de Fue' (× SUPERBA)
* 'Brillant' (SPECIOSA)
* 'Brilliant' (SPECIOSA)
† 'Bugeauti' (SPECIOSA)
'Bunyardii' (× SUPERBA)
* 'California' (× CALIFORNICA)
* 'Californica' (× CALIFORNICA)
'Camellia-Bloemige' (SPECIOSA)
* 'Camelliaefolia' (SPECIOSA)
'Camelliflora' (SPECIOSA)
* 'Cameo' (× SUPERBA)
* 'Candicans' (SPECIOSA)
* 'Candida' (SPECIOSA)
* 'Candidissima' (SPECIOSA)
* 'Candidissimum' (SPECIOSA)
* 'Cardinal' (× CALIFORNICA)
* 'Cardinalis' (SPECIOSA)
* 'Cardinal Red' (× CALIFORNICA)
'Carmine Queen' (?)
* 'Carnea' (SPECIOSA)
† 'Carnea Plena' (prob. SPECIOSA)
* Var. *cathayensis* (CATHAYENSIS)
* 'Charming' (× SUPERBA)
'Chosan' (× SUPERBA)

'*Choshan*' (× SUPERBA)
'Choshun' (?)
† 'Citri-pomma' (SPECIOSA)
* '*Clark's Giant*' (× CALIFORNICA)
* 'Clarke's Giant Red' (× CALIFORNICA)
'Clayden' (?)
* 'Coccinea' (SPECIOSA)
* '*Coccinea Erecta*' (SPECIOSA)
* '*Coccinea Plena*' (SPECIOSA)
* 'Cole's Red' (× SUPERBA)
* 'Colette' (× SUPERBA)
* 'Columbia' (× SUPERBA)
* 'Contorta' (SPECIOSA)
* 'Coquelicot' (× SUPERBA)
* 'Coral Beauty' (× SUPERBA)
* '*Coral Glow*' (× SUPERBA)
* 'Corallina' (× SUPERBA)
'Coral Red' (?)
* 'Coral Sea' (× SUPERBA)
* 'Crimson and Gold' (× SUPERBA)
* '*Crimson and Red*' (× SUPERBA)
* 'Crimson Beauty' (× SUPERBA)
* '*Crimson King*' (× SUPERBA)
* 'Crippsi' (?)
* 'Cynthia' (× CLARKIANA)
* 'Dark Crimson' (SPECIOSA)
* 'Dawn' (× CALIFORNICA)
* 'Deep Pink' (SPECIOSA)
* 'Deep Red' (× CALIFORNICA)
* 'Deep Salmon' (?)
* 'Della Robbia' (× SUPERBA)
* 'Dixie Scarlet' (?)
* 'Doctor Bang's Pink' (SPECIOSA)
'Dolichocarpa' (prob. SPECIOSA)
* 'Dorothy Rowe' (JAPONICA)
† '*Double Flowering*' (SPECIOSA)
* '*Double Orange*' (× SUPERBA)
* 'Double Red' (× SUPERBA)
* '*Double Scarlet*' (SPECIOSA)
* 'Double Vermilion' (× SUPERBA)
* '*Dr. Bang's Pink*' (SPECIOSA)
* 'Dwarf Coral' (× SUPERBA)
* 'Dwarf Orange Red' (?)
* '*Dwarf Poppy*' (JAPONICA)
* 'Dwarf Poppy Red' (JAPONICA)
'Dwarf Red' (SPECIOSA)
* 'Dwarf Scarlet' (?)
* 'Early Apple Blossom' (× SUPERBA)
* 'Early Orange' (× SUPERBA)
'Eburnea (SPECIOSA)
* 'Ecarlate' (× SUPERBA)
* 'Echo' (SPECIOSA)
* '*Eclarate*' (× SUPERBA)
* 'Elly Mossel' (× SUPERBA)
† '*Emilie Soutzo*' (SPECIOSA)
* '*Enchantment*' (× CALIFORNICA)
* 'Enchantress' (× CALIFORNICA)
* 'Ernst Finken' (× SUPERBA)
* 'Etna' (× SUPERBA)
* '*Eugenioides*' (SPECIOSA)
* 'Euphrosyne' (SPECIOSA)
† 'Exilis' (SPECIOSA)
* 'Eximia' (SPECIOSA)
'*Extus*' (SPECIOSA)
'Extus Acumineus' (× SUPERBA)
'*Extus Coccinea*' (SPECIOSA)
* '*Falconnet*' (SPECIOSA)
* '*Falconnet Carlet*' (SPECIOSA)
* 'Falconnet Charlet' (SPECIOSA)
* '*Falconnet Charlet*' (SPECIOSA)
* '*Falconnet Charlot*' (SPECIOSA)
* '*Falconnet Charlot*' (SPECIOSA)
* '*Falconnet Scarlet*' (SPECIOSA)
* 'Fascination' (× SUPERBA)
† 'Fastigiata' (SPECIOSA)
* 'Fire' (× CALIFORNICA)
* 'Fireball' (SPECIOSA)
* 'Fire Dance' (× SUPERBA)
* '*Fire Dancer*' (× SUPERBA)
* 'Flamingo' (× CALIFORNICA)
* '*Flora Carnea*' (SPECIOSA)
* '*Flore Albo*' (SPECIOSA)
† 'Flore Albo Fructu Odorata' (SPECIOSA)
† 'Flore Albo Inermis' (SPECIOSA)
* '*Flore Albo Pleno*' (SPECIOSA)
'*Flore Albo Semipleno*' (SPECIOSA)
* '*Flore Atrosanguinea*' (SPECIOSA)
† '*Flore Aurantiaca*' (SPECIOSA)
* '*Flore Carnea*' (SPECIOSA)
† '*Flore Coccineo*' (SPECIOSA)
* '*Flore Kermesino*' (SPECIOSA)
* '*Flore Plena*' (SPECIOSA)
* '*Flore Plena Rosea*' (SPECIOSA)
'*Flore Pleno*' (SPECIOSA)
* '*Flore Pleno*' (SPECIOSA)
* '*Flore Purpurea*' (SPECIOSA)

* *'Flore Rosea Plena'* (SPECIOSA)
† 'Flore Roseo' (SPECIOSA)
* *'Flore Rubra'* (SPECIOSA)
† 'Flore Rubro Aurantiaca' (SPECIOSA)
* *'Flore Rubro Pleno'* (SPECIOSA)
† *'Flore Semi-pleno'* (SPECIOSA)
*'Floribunda'* (SPECIOSA)
* *'Floribus Puniceis'* (SPECIOSA)
† *'Floribus Roseis'* (SPECIOSA)
* 'Foliis Rubris' (× SUPERBA)
† 'Foliis Variegatis' (SPECIOSA)
† *'Fructa Odoratissima'* (SPECIOSA)
* 'Fructico Alba' (× SUPERBA)
† *'Fructico Odoratissima'* (SPECIOSA)
* *'Fructo Alba'* (× SUPERBA)
* *'Fructu Alba'* (× SUPERBA)
† *'Fructu Odoratissimo'* (SPECIOSA)
* 'Fruitlandi' (× SUPERBA)
† 'Gandavensis' (SPECIOSA)
* 'Gaujardii' (SPECIOSA)
* Var. *genuina* (SPECIOSA)
* 'George Landis' (× SUPERBA)
† 'Gigantea' (SPECIOSA)
* 'Glowing-Ember' (× SUPERBA)
* 'Grandiflora' (SPECIOSA)
† *'Grandiflora'* (SPECIOSA)
* *'Grandiflora'* (× SUPERBA)
* *'Grandiflora Alba Plena'* (SPECIOSA)
'Grandiflora Perfecta' (× SUPERBA)
* *'Grandiflora Perfecta'* (× SUPERBA)
* *'Grandiflora Plena'* (SPECIOSA)
* *'Grandiflora Rosea'* (SPECIOSA)
* 'Grandiflora Rosea' (× SUPERBA)
* *'Grandiflora Roseo-semiplena'* (SPECIOSA)
* *'Grandiflora Rubra'* (SPECIOSA)
* *'Grandiflora Semiplena'* (SPECIOSA)
* 'Grenade' (× SUPERBA)
'Hakugyoku' (?)
* 'Hanazono' (SPECIOSA)
* 'Harlequin' (× SUPERBA)
'Hever Castle' (× SUPERBA)
'Hibotan' (?)
* 'High Noon' (× SUPERBA)
* 'Hi-no-Tsukasa' (× SUPERBA)
† 'Histrix' (prob. SPECIOSA)
* 'Hollandia' (× SUPERBA)
'Hybrida' (× VILMORINIANA) [1]
† 'Ignea' (prob. SPECIOSA)
† *'Ignis'* (prob. SPECIOSA)
* *'Imbricata'* (SPECIOSA)
* *'Incende'* (× SUPERBA)
* 'Incendie' (× SUPERBA)
* *'Incendie'* (× SUPERBA)
* 'Indian Chief' (× SUPERBA)
† *'Inermis'* (SPECIOSA)
'Jane Taudevin' (× SUPERBA)
* *'Japan Blush'* (SPECIOSA)
* 'Japanese Scarlet' (SPECIOSA)
* *'Japan Scarlet'* (SPECIOSA)
* *'Japan White'* (SPECIOSA)
Var. japonica (JAPONICA)
* 'Jet Trail' (× SUPERBA)
* 'Jimmy's Choice' (SPECIOSA)
* 'Juliet' (× SUPERBA)
'Kan-Toyo-Nishiki' (SPECIOSA)
*'Karl Ramcke'* (× SUPERBA)
* *'Kermesiana Semi-plena'* (SPECIOSA)
† 'Kermesina' (prob. SPECIOSA)
* 'Kermesina Semiplena' (SPECIOSA)
'Kimpo' (?)
* 'Kinjishi' (× SUPERBA)
* *'Kinshi'* (× SUPERBA)
* *'Knap Hill'* (× SUPERBA)
'Knap Hill Radiance' (SPECIOSA)
* 'Knap Hill Scarlet' (× SUPERBA)
'Knap Hill Seedlings' (prob. × SUPERBA)
* *'Knap Hill Variety'* (× SUPERBA)
'Kogyoku (?)
'Kokko' (prob. SPECIOSA)
*'Kokuko'* (prob. SPECIOSA)
'Koshi-no-Homare' (?)
'Koshi-no-Yuki' (?)
† 'Lady Emily Swartz' (prob. SPECIOSA)

[1] The epithet "hybrida" has been used widely and loosely in the horticultural literature concerning the genus *Chaenomeles*. Many of the plants named as *Chaenomeles hybrida* are not hybrids. Any attempt to establish the priority of use of this epithet together with an attempt to supply new names for later synonyms would create a great deal of confusion. The rules of nomenclature of cultivated plants seek to establish stability of "cultivar" names and for this reason the epithet *hybrida* is regarded only as descriptive.

* Var. *lagenaria* (SPECIOSA)
'Leichtlinii' (× SUPERBA)
* *'Leonard's Variety'* (SPECIOSA)
* 'Leonard's Velvety' (SPECIOSA)
* 'Lewalliensis' (?)
* 'Limoni' (SPECIOSA)
† 'Lutea' (SPECIOSA)
† 'Lutea Macrantha' (SPECIOSA)
'Lutea Viridis' (SPECIOSA)
† 'Macrantha' (prob. SPECIOSA)
* 'Macrocarpa' (SPECIOSA)
* *'Maerloosii'* (SPECIOSA)
* *'Maillardii'* (SPECIOSA)
* *'Mallardii'* (CATHAYENSIS)
* 'Mallardii' (SPECIOSA)
* *'Mallardii'* (SPECIOSA)
* 'Mallarot' (SPECIOSA)
* *'Mallordi'* (SPECIOSA)
* *'Mallordu'* (SPECIOSA)
* 'Mandarin' (× SUPERBA)
* 'Margaret Adams' (× SUPERBA)
* 'Marmorata' (SPECIOSA)
* 'Masterpiece' (× CALIFORNICA)
* 'Maulei' (JAPONICA)
*'Maulei Seedlings'* (prob. JAPONICA)
* *'Mawlei'* (JAPONICA)
* *'Millardi'* (SPECIOSA)
* 'Minerva' (× CLARKIANA)
* *'Moerheimii'* (SPECIOSA)
* *'Moerloesei'* (SPECIOSA)
* *'Moerloesi'* (SPECIOSA)
* 'Moerloosei' (SPECIOSA)
* *'Moerloosii'* (SPECIOSA)
* *'Moerlosii'* (SPECIOSA)
* *'Moerlozi'* (SPECIOSA)
* *'Moorlosii'* (SPECIOSA)
'Momijiyama' (prob. × SUPERBA)
† 'Monstruosa' (SPECIOSA)
* *'Moulei'* (JAPONICA)
* 'Mount Everest' (× VILMORINIANA)
* 'Mount Shasta' (× SUPERBA)
* *'Mt. Everest'* (× VILMORINIANA)
* *'Mt. Shasta'* (× SUPERBA)
* *'Multiflora'* (SPECIOSA)
* *'Nana'* (JAPONICA)
† *'Nana'* (SPECIOSA)
† *'Nana Compacta'* (SPECIOSA)
* 'Naranja' (× SUPERBA)
* 'Nasturtium' (× CALIFORNICA)
* 'Natorp's Hybrid' (?)
* *'Navel'* (SPECIOSA)
* *'New Red Sensational'* (× SUPERBA)
* 'Nicoline' (× SUPERBA)
* 'Nishikichidon' (× SUPERBA)
* 'Nivalis' (SPECIOSA)
* *'Nivalis Major'* (SPECIOSA)
† 'Nivea' (SPECIOSA)
*'Nivea Coccinea'* (SPECIOSA)
'Nivea Extus Coccinea' (SPECIOSA)
'Nivea Intus Kermesina' (prob. SPECIOSA)
* 'Orange' (prob. × SUPERBA)
'Orange Beauty' (JAPONICA)
* 'Orange Red' (?)
† *'Orange Scarlet'* (SPECIOSA)
'Ormond Crimson' (prob. SPECIOSA)
'Ormond Scarlet' (prob. SPECIOSA)
* 'Otto Froebel' (× SUPERBA)
* 'Pacific Red' (SPECIOSA)
* 'Papeleui' (SPECIOSA)
† 'Pedunculata' (SPECIOSA)
† 'Pendula' (prob. SPECIOSA)
*'Perfecta'* (× SUPERBA)
* 'Perfecta' (× SUPERBA)
* *'Permesina Semiplena'* (SPECIOSA)
* 'Phylis Moore' (SPECIOSA)
* *'Phyllis Moore'* (SPECIOSA)
* *'Pigmaea'* (JAPONICA)
* *'Pigmaea'* (JAPONICA)
* *'Pigmani'* (JAPONICA)
* *'Pink'* (SPECIOSA)
'Pink' (?)
* 'Pink Beauty' (× CALIFORNICA)
* 'Pink Lady' (× SUPERBA)
'Pink Perfection' (?)
* *'Pink Princess'* (× SUPERBA)
* *'Pinkstripe'* (SPECIOSA)
† *'Piriformis'* (prob. SPECIOSA)
'Plena' (JAPONICA)
*'Plena'* (SPECIOSA)
* 'Porcelain Rose' (× SUPERBA)
'Port Eliot' (?)
† 'Princeps' (SPECIOSA)
† *'Princesse Emile Sontza'* (SPECIOSA)
† *'Princesse Emilie'* (SPECIOSA)
† 'Princesse Emilie Soutzo' (SPECIOSA)
* 'Purity' (?)
* *'Purpurea'* (SPECIOSA)

Var. pygmaea (JAPONICA)
° *'Pygmaea'* (JAPONICA)
° *'Pygmaea Alba'* (JAPONICA)
° *'Pygmy'* (JAPONICA)
† 'Pyriformis' (prob. SPECIOSA)
'Rakuyo' (prob. × SUPERBA)
° *'Red'* (SPECIOSA)
° 'Red Chief' (× SUPERBA)
° *'Red Flowers'* (× SUPERBA)
° *'Red Ripples'* (SPECIOSA)
° 'Red Ruffles' (SPECIOSA)
° 'Red Sprite' (SPECIOSA)
° *'Red Upright'* (SPECIOSA)
° *'Renny Mossel'* (× SUPERBA)
'Riccartonii' (?)
° 'Rinho' (SPECIOSA)
° *'Rosalba'* (SPECIOSA)
† *'Rosea'* (SPECIOSA)
° *'Rosea'* (SPECIOSA)
° *'Rosea'* (× SUPERBA)
° *'Rosea Flora Pleno'* (SPECIOSA)
° *'Rosea Flora Plena'* (SPECIOSA)
° 'Rosea Grandiflora (SPECIOSA)
° *'Rosea Grandiflora'* (× SUPERBA)
° *'Rosea Grandiflora Semiplena'* (SPECIOSA)
° 'Rosea Plena' (SPECIOSA)
° 'Rosea Semiplena' (SPECIOSA)
° 'Rosemary' (× CALIFORNICA)
° *'Rosepink'* (SPECIOSA)
° *'Rosepink'* (SPECIOSA)
° 'Rosy Morn' (× CALIFORNICA)
° 'Rosy Red' (?)
° *'Rowallana'* (× SUPERBA)
° 'Rowallane' (× SUPERBA)
° *'Rowallane Seedling'* (× SUPERBA)
° *'Rowallane Variety'* (× SUPERBA)
° *'Rowalling Seedling'* (× SUPERBA)
° 'Roxana Foster' (× SUPERBA)
° 'Rubra' (SPECIOSA)
† *'Rubra-aurantiaca'* (SPECIOSA)
† *'Rubra Aurantiaca Duplex Nova'* (SPECIOSA)
° 'Rubra Grandiflora' (SPECIOSA)
'Rubra Plena' (SPECIOSA)
*'Rubra Pleno'* (SPECIOSA)
† 'Rubra Semiplena' (SPECIOSA)
° *'Rubriflora'* (SPECIOSA)
° *'Rubrifolia'* (× SUPERBA)
† *'Rubro-aurantiaca'* (SPECIOSA)
° *'Rubro Plena'* (SPECIOSA)
° *'Rubro-sanguinea Plena'* (SPECIOSA)
° 'Ruby Glow' (× SUPERBA)
'Russell's Red' (SPECIOSA)
† 'Salicifolia' (prob. SPECIOSA)
° 'Salmon' (× SUPERBA)
'Salmonea' (?)
'Salmon Queen' (?)
'Sämmlinge von Andenken an Karl Ramcke' (× SUPERBA)
° 'Sanguinea' (× SUPERBA)
° *'Sanguinea Flore Pleno'* (SPECIOSA)
*'Sanguinea Multiflora'* (SPECIOSA)
° 'Sanguinea Plena' (SPECIOSA)
† 'Sanguinea Plena Multiflora' (SPECIOSA)
° 'Sanguinea Semiplena' (SPECIOSA)
° 'San Jose' (prob. × CALIFORNICA)
° *'Sargentiana'* (JAPONICA)
° 'Sargentii' (JAPONICA)
† 'Sarmentosa' (prob. SPECIOSA)
° *'Scarlet'* (SPECIOSA)
° 'Scarlet' (× SUPERBA)
° *'Scarlet and Gold'* (× SUPERBA)
*'Semi-alba-pleno'* (SPECIOSA)
† *'Semi-plena'* (SPECIOSA)
† *'Semipleno'* (SPECIOSA)
° *'Semperflorens'* (× SUPERBA)
° *'Sensational New Red'* (× SUPERBA)
† 'Serotina' (SPECIOSA)
° *'Shasta'* (?)
° *'Shell Pink'* (× SUPERBA)
° *'Shinonome'* (× SUPERBA)
'Shirabotan' (× SUPERBA)
*'Shirabotau'* (× SUPERBA)
*'Shirobotan'* (× SUPERBA)
'Shirataum' (SPECIOSA)
'Shokko' (?)
† 'Simikenriana' (SPECIOSA)
° *'Simon'* (SPECIOSA)
° 'Simonii' (SPECIOSA)
° *'Simoni Rubra'* (SPECIOSA)
° *'Simonis'* (SPECIOSA)
° *'Simonsii'* (SPECIOSA)
† *'Simplex Alba'* (prob. SPECIOSA)
° 'Single White' (?)
† 'Sinica' (?)
° 'Snow' (SPECIOSA)

* 'Snowbird' (?)
'Snow Queen' (SPECIOSA)
* *'Snow White'* (SPECIOSA)
* 'Spitfire' (SPECIOSA)
† 'Splendens' (prob. SPECIOSA)
* 'Spring Fashion' (× SUPERBA)
* 'Stanford Red' (× SUPERBA)
* 'Starlight' (SPECIOSA)
† 'Striata' (SPECIOSA)
* *'Sulphurea'* (SPECIOSA)
* *'Sulphurea Aurea'* (SPECIOSA)
* 'Sulphurea Perfecta' (SPECIOSA)
* *'Sunrise'* (× SUPERBA)
* 'Sunset' (× SUPERBA)
* *'Sunset Glory'* (× CALIFORNICA)
* 'Sunset Glow' (× CALIFORNICA)
* *'Sunset Gold'* (× CALIFORNICA)
* 'Superba' (× SUPERBA)
* *'Sweet Glow'* (× CALIFORNICA)
* 'Taioh-Nishiki' (SPECIOSA)
* 'Taiojishi' (JAPONICA)
* 'Tall Large Flowering Salmon' (?)
* 'Tani-no-Yuki' (SPECIOSA)
* *'Taroyishi'* (SPECIOSA)
'Tatsugashira' (prob. SPECIOSA)
'Tattagawa' (?)
'Temmei' (?)
† 'Terra Cotta' (?)
* 'Texas Pink' (SPECIOSA)
* 'Texas Scarlet' (× SUPERBA)
† 'Thornless Crimson' (?)
* *'Thornless Pink'* (× SUPERBA)
* 'Tiochisi' (prob. JAPONICA)
* *'Tortuosa'* (SPECIOSA)
* 'Tortuosa' (× SUPERBA)
* 'Toyo-Nishiki' (SPECIOSA)
* *'Toyonishiki'* (SPECIOSA)
* *'Trichogyna'* (SPECIOSA)
* 'Tricolor' (JAPONICA)
* 'Tsukasa-Botan' (?)
* *'Tsukasi'* (?)
* Var. *typica* (JAPONICA)
'Ulidia' (× SUPERBA)
† 'Umbato' (?)
* *'Umbellata'* (SPECIOSA)
* *'Umbellicata'* (SPECIOSA)
* *'Umbellicata Rosea'* (SPECIOSA)
* *'Umbicillata'* (SPECIOSA)
* *'Umbicillata Rosea'* (SPECIOSA)
* 'Umbilicata' (SPECIOSA)
* *Umbilicata Macrocarpa'* (SPECIOSA)
† 'Umbilicata Nana' (SPECIOSA)
* *'Umbilicata Rosea'* (SPECIOSA)
* *'Umbilisata'* (SPECIOSA)
* *'Umbilitica'* (SPECIOSA)
* *'Upright'* (SPECIOSA)
* 'Upright Pink' (prob. SPECIOSA)
* *'Upright Red'* (SPECIOSA)
* *'Upright Spitfire'* (SPECIOSA)
* *'Upright White'* (prob. SPECIOSA)
'Van Aerschodti' (prob. SPECIOSA)
† *'Variabilis Tricolor'* (SPECIOSA)
† 'Variegata' (SPECIOSA)
† *'Variegatis'* (SPECIOSA)
* 'Vedrariensis' (× VILMORINIANA)
* *'Verboom's Vermilion'* (× SUPERBA)
* 'Vermilion' (× SUPERBA)
* *'Vermilion Double'* (× SUPERBA)
* 'Versicolor' (SPECIOSA)
* *'Versicolor Lutea'* (SPECIOSA)
* 'Versicolor Lutescens' (SPECIOSA)
† 'Versicolor Plena' (prob. SPECIOSA)
† 'Versicolor Semiplena' (prob. SPECIOSA)
* 'Vesuvius' (× SUPERBA)
* 'Wakaba' (× SUPERBA)
* *'White'* (SPECIOSA)
* *'White'* (SPECIOSA)
* 'White Upright' (prob. SPECIOSA)
* *'White Fruit'* (× SUPERBA)
* *'Willis Strain'* (× SUPERBA)
* Var. *wilsonii* (CATHAYENSIS)
* 'Winter Cheer' (prob. × SUPERBA)
'Winter Flowering' (?)
'Woking Star' (?)
'Yaegaki' (× SUPERBA)
† 'Yellow' (SPECIOSA)
'Yokuku' (?)
* *'Yuga'* (prob. SPECIOSA)
* 'Yuyo' (prob. SPECIOSA)
'Zabelii' (?)
'Zansetsu' (?)
'Zōge' (JAPONICA)

## II. LIST OF SPECIES AND HYBRID GROUPS WITH THEIR INCLUDED CULTIVARS

This second list is comprised of the names of species, varieties and hybrid groups (which, when appearing for the first time are indicated by **boldface** type; however, the hybrid groups, when cited in the discussion, are indicated by LARGE and SMALL capitals) together with the cultivars included under each, in alphabetical order; the cultivar names which are maintained are indicated by LARGE and SMALL capitals. Botanical synonyms and polynomials, which were latinized cultivar names, are indicated by *italics*. The earliest bibliographic reference is given for each cultivar; if two references are cited the first refers to the earliest mention of the name, the second to the place of publication of the description. In order to keep this list within reasonable limits, the transfer of cultivars or varieties from one species to another is not included. Synonymy is given when necessary to prevent further confusion. A short description of each cultivar is also provided, based on living plants whenever possible or compiled from descriptions published previously. It was also found necessary to supplement the references to each species or hybrid group with a short "horticultural" description, since the intrinsic value of the cultivars and their uses in horticulture pertain to both the general aspect of the shrub and the color of the flowers.

Many difficulties were encountered during this study. Some, especially those due to the instability of the nomenclature in Japanese Quinces, were time consuming. Each name had to be sought in books and nursery catalogues under at least two genera, *Cydonia* and *Chaenomeles*. The controversy over the application of the specific epithet "japonica" induced me to consider any cultivar or varietal name in *Chaenomeles* as a member of an undetermined species or hybrid group. Consequently, each cultivar had to be examined in order to prepare LIST II. The information obtained was organized under the following categories, given here in order of decreasing importance: 1, observations on living plants; 2, studies of herbarium specimens; 3, compilation of nomenclatural synonyms; 4, descriptions of cultivars; 5, records of parentage; 6, dates of origin. All the evidence was evaluated according to the following characters present in the three types, "cathayensis," "japonica," and "speciosa": appearance of the shrub; pubescence or warting of the twigs; serration, size, and shape of the leaves; color, size, and shape of the flowers; appearance, size, and shape of the fruits. The results determined whether or not a given cultivar was of hybrid origin. Some of the conclusions were contrary to the general opinions often accepted by horticulturists and given in nursery catalogues.

Another difficulty arose in deciding whether or not a given name represents a definite and stable clone reproduced vegetatively, or only a variable unstable population such as a color selection in a batch of seedlings. Since there was no way of determining to which category some of the names belong, the situation is stated for each case according to the evidence. The botanical varieties are

also included since most of them were described from gardens and are, in fact, cultivars, or were introduced to cultivation after being described from the "wild."

An additional problem encountered was the variation in spelling. For instance *Chaenomeles* 'Moerloosei', named for the Belgian horticulturist Moerloose, is found in nursery catalogues under 'Maerloosii', 'Moerheimii', 'Moerlozi', etc. It is hoped that the list of orthographic variations will help nurserymen to correct and coordinate their files and rectify the impression that they have a score of different entities. By careful study it has been possible to verify the fact that such cultivars as 'Cardinal' and 'Cardinalis', 'Choshan' and 'Choshun', 'Shasta' and 'Mount Shasta', 'Variegata' and 'Variegatis', etc., are not variations in spelling within one species, but apply to entirely different plants.

**Chaenomeles cathayensis** (Hemsl.) Schneid. Ill. Handb. Laubh. **1:** 730. 1906.

*Cydonia cathayensis* Hemsl. in Hook. Icon. **27:** *pl. 2657* & *2658*. 1901. LECTOTYPE: Hupeh, *A. Henry 5263* (Herb. Kew.; ISOLECTOTYPE, Gray Herbarium), *Henry 1916* (SYNTYPE, Herb. Kew., not seen).

Shrubs reaching 10 feet or more, easily trained to form a small tree. Branches few, straight, erect, stiff, strongly armed with numerous spurs. Young shoots pubescent or glabrescent, those of the second year completely glabrous. Leaves elliptic to lanceolate, when young commonly covered by a thick fulvous tomentum on the under surface, sharply serrate with the serration terminating in an awn-like tip. Flowers white to pink. Mostly cultivated for the abundant ovoid fruits up to 15 or even 20 cm. long, which ripen late.

The fruits are used in China for medicinal purposes, and local varieties are assumed to exist there in cultivation. Although *C. cathayensis* has been found in the wild in China, and in southern Tibet up to an altitude of 9500 feet, it is not hardy north of Zone VI.

Var. *cathayensis* (*Chaenomeles lagenaria* var. *cathayensis* Rehder in Sargent, Pl. Wilson. **2:** 297. 1915) = **C. cathayensis.**

'Mallardii' (*Cydonia mallardii* Anonymous, Jour. Roy. Hort. Soc. **41:** cxxxii. 1915. Corrected anonymously to *Pyrus japonica* var. *wilsonii* in Jour. Roy. Hort. Soc. **41:** *f. 122*. 1915–16) = **C. cathayensis.**

Var. *wilsonii* (*Chaenomeles lagenaria* var. *wilsonii* Rehder in Sargent, Pl. Wilson. **2:** 298. 1915) = **C. cathayensis.** This variety was distinguished by Rehder from *C. lagenaria* var. *cathayensis* by "the dense fulvous tomentum of the under side of its leaves." This character, however, does not appear in plants reproduced by seeds, and is neither correlated with any geographical or ecological distribution, nor with other morphological characters of wild plants. Glabrous or pubescent leaves seem to appear at random in young plants, therefore a varietal rank is not justified.

**Chaenomeles japonica** (Thunb.) Lindl. ex Spach, Hist. Nat. Vég. Phan. **2:** 159. 1834.

Var. **japonica.**

*Pyrus japonica* Thunb. Fl. Jap. 207. 1784. HOLOTYPE: Japan, *Thunberg, s.n.* (Herb. Upsala).

*Chaenomeles* (*Pyrus japonica* Thunb.) Lindl. Trans. Linn. Soc. **13:** 96. 1822 (as *Choenomeles*).

Dwarf shrub about 3–4 feet high. Branches widely spreading with short, slender spines. Young shoots covered with a short, scabrous tomentum; those of the second year verruculose. Leaves obovate to spathulate, glabrous even when young, coarsely crenate. Flowers small, usually salmon to orange. Fruits similar in shape to gnarled apples, small, to 4 cm. ripening early.

The extremely fragrant fruits are used for making jelly. This species is wild in Japan, usually growing at low altitudes. It is the hardiest species in the genus.

'Alba' (*C. maulei* var. *alba* Nakai, Jap. Jour. Bot. **4:** 329. 1929) = 'ZŌGE'. Since the name 'Alba' is preoccupied by a member of the SUPERBA group, we propose to call this cultivar 'Zōge' which means ivory in Japanese.

Var. **alpina** (*C. japonica* var. *alpina* Maxim., Bull. Acad. Sci. St. Petersb. **19:** 168. 1873). Smaller than **C. japonica** var. **japonica** in all its parts. The type specimen of this variety was collected on the mountains of the Island of Kyushu, Japan. This name should not be applied to a cultivar.

'Alpina' (*Cydonia maulei* var. *alpina* Rehder in Bailey, Cycl. Am. Hort. **1:** 427. 1900) = 'SARGENTII'. The material in cultivation under this name was grown originally from seeds brought by Sargent from one of the Japanese islands other than Kyushu.

'Alpina' (*Chaenomeles alpina* Koehne, Gatt. Pomac. 28. *pl. 2, f. 23 a–c.* 1890) = **C. japonica** var. **japonica.**

'ARTHUR HILL' (Hill Nurs., Dundee, Ill. Wholesale Trade List 1961). Flowers salmon-pink, single. Selection no. 7 of Dr. A. Colby of the University of Illinois. Named for Arthur Hill, father of the present manager of the Hill Nursery, 1961.

'AUREA' (Wayside Gard., Mentor, Ohio, Cat. 1942). Flowers orange, suffused with rosy red, single. Selection of Wayside Gardens, before 1942.

'DOROTHY ROWE' (formerly 'Pygmaea alba' a name not acceptable according to the International Code of Nomenclature for Cultivated Plants). Flowers small, white tinted with pink and lemon, single. Selection of Dubois Nursery, Cincinnati, Ohio, before 1960. Named for Mrs. Dorothy S. Rowe who founded the Stanley M. Rowe Arboretum where this cultivar is growing. This is a new cultivar previously undescribed.

'Dwarf Poppy' (Arb. Wageningen, Neth., Seed List 1960) = 'DWARF POPPY RED'.

'DWARF POPPY RED' (Anonymous, Jaarb. Boskoop **1954:** 116. 1954, without description). Flowers large for a **C. japonica**, flat open, "poppy-red," single.

Selection of W. B. Clarke, San Jose, California, probably no. 330, sent to Kluis Nursery, Boskoop, Netherlands, around 1946.

'Maulei' (*Pyrus maulei* Mast. Gard. Chron. II. **1:** 756, *f. 159.* 1874). Flowers salmon-pink to orange, single. Named for Messrs. Maule, nurserymen at Bristol, England, who introduced it from Japan in 1869. The strain of **C. japonica** introduced by the Maules from Japanese gardens differs from the alpine strain introduced by Sargent in growing slightly taller and in having a heavier fruit production.

'Maulei Seedlings' (Slocock Nurs., Woking, Engl., Cat. 1958–59). Flowers orange-flame. Probably not a clone, but only selected seedlings of **C. japonica** 'Maulei'.

'Mawlei' (*C. japonica Mawlei* Buyssens Nurs., Uccle, Belg., Cat. 1933, without description) = 'Maulei'.

'Moulei' (Van Geert Nurs., Anvers, Belg., Cat. 1896, without description) = 'Maulei'.

'Nana' (cult. at the Univ. of Connecticut, Storrs, Conn.) = 'Pigmani'.

'Orange Beauty' (Jaarb. Boskoop **1954:** 116. 1954, without description). Flowers orange, single; Dutch selection, before 1954.

'Pigmaea' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1935) = 'Sargentii'.

'Pigmaea' (*C. lagenaria* Pigmaea, Light Tree Nurs., Richland, Mich., Price List 1958) = 'Pigmani'.

'Pigmani' (Anonymous, Pl. Buyer's Guide 93. 1958, without description). Flowers red-orange, single, often unisexual. Selected in Kallay Nursery, Painesville, Ohio, in 1954, under the name of 'Pigmaea'.

'Plena' (*C. maulei* f. *plena* Iwata, Jour. Agr. Sci. [Setagaya], **5**(4): 36. 1960). Flowers double; flower color and origin unknown, before 1960. In Japanese gardens.

Var. **pygmaea** (*C. japonica* var. γ *pygmaea* Maxim. Bull. Acad. Sci. Petersb. **19:** 168. 1873). Branches often subterranean. The type specimen of this variety was collected around Yokohama, Japan. The name should not be applied to a cultivar. It is not a synonym of **C. japonica** var. **alpina** Maxim.

'Pygmaea' (*C. japonica pygmaea* Chenault Nurs., Orléans, Fr., Cat. 1910–11) = 'Sargentii'.

'Pygmaea alba' (cult. at the Stanley M. Rowe Arb., Cincinnati, Ohio). This name is not acceptable according to the International Code of Nomenclature for Cultivated Plants which prohibits new names of cultivars in a Latin form. We propose to name it 'Dorothy Rowe'.

'Pygmy' (Linn County Nurs., Center Point, Iowa, Cat. 1960) = 'Sargentii'.

'Sargentiana' (cult. at the Wageningen Arb., Wageningen, Neth.) = 'Sargentii'.

'Sargentii' (*Cydonia sargenti* Lemoine Nurs., Nancy, Fr., Cat. no. **143:** ix. 1899). Shrub more dwarf than the typical form of the species; flowers

salmon-pink to orange, single. Named for C. S. Sargent, first director of the Arnold Arboretum; introduced by him from Japan in 1892.

'Taiojishi' (E. L. Kammerer, Bull. Morton Arb. **29**(5): 22. 1954). Flowers orange, single. Selection of K. Wada, Hakoneya Nurseries, Numazu-shi, Japan, before 1939. Taiojishi means Great King Lion.

'Tiochisi' (cult. at the Univ. of Minn., St. Paul, Minn.) = 'Taiojishi'.

'Tricolor' (*C. japonica tricolor* Parsons Nurs., Flushing, N. Y., Cat. 1887, without description, *ibid.*, Descr. Cat. no. 39 [prob. 1889], with description). Leaves pink and white variegated; flowers salmon-pink. Origin unknown, before 1887.

Var. *typica* (*Cydonia japonica* var. *typica* Makino, Bot. Mag. Tokyo **22:** 63. 1908) = **C. japonica** var. **japonica.**

'Zōge' (formerly 'Alba', a name retained for another cultivar). Flowers creamy-white, single. In Japanese gardens. This cultivar was illustrated in Iwasaki, Honzo Dzufu 60, fol. 10 recto. 1919 (as *C. japonica* f.). Zōge, meaning ivory, is an allusion to the color of the flowers.

**Chaenomeles speciosa** (Sweet) Nakai, Jap. Jour. Bot. **4:** 331. 1929.

*Cydonia speciosa* Sweet, Hort. Suburb. London 113. 1818.

This species is typified by plate no. 692 (not 629) of the Bot. Mag. **18** (1803). The plate represents a flowered branch surmounted by a young shoot. The flowers are borne on long peduncles, a normal development in warm weather. The illustration was drawn in August as indicated in the text. The specimen represented has abnormal, semidouble, and male flowers only.

Shrubs usually 6 feet, occasionally up to 10 feet high. Branches numerous, erect to spreading, spiny. Young shoots glabrous or slightly pubescent; those of the second year glabrous. Leaves ovate to oblong, glabrous, or when young slightly pubescent on the veins of the under surface, sharply serrate. Flowers normally red, but also white or pink; similar variation among wild specimens. Fruits very variable in shape, size, and time of ripening.

The fruits ripen well indoors and can be used for making jelly. This species is found wild in China at various altitudes. The shrub is hardy, but north of Zone V the flower buds have a tendency to freeze above snow line.

'Alarm' (Harrison, Handb. Trees & Shrubs South. Hem. 87. *f.* 1959). Flowers deep red, single. Chance seedling about 1935, in a garden in Wanganui, New Zealand. Introduced by Harrison Nurseries, Palmerston North, N. Z., before 1959.

'Alba' (*Pyrus japonica alba* Lodd. Bot. Cab. **6:** 541, *pl.* 1821) = 'Candidissima'.

'Alba' (*Cydonia japonica alba* Späth, Späth-Buch, 220. 1930) = 'Nivalis'.

'Alba candida' (Dickinson Nurs., Chatenay, Fr., Cat. 1889–90, without description) = 'Candida'.

'Alba Cincta' (*C. japonica alba cincta* Beissner *et al.*, Handb. Laubh.-Ben., 181. 1903, without description). Flowers white with a pink margin, single;

fruits ovoid, calyx accrescent. Probably selection of Louis van Houtte, Ghent, Belgium, before 1861.

'Alba Cincta Plena' (Barbier Nurs., Orléans, Fr., Cat. 1896, without description). Flower color and origin unknown, before 1896.

'Alba cintra' (Wister, Swarthmore Pl. Notes **1955:** 212. 1955) = 'Alba Cincta'.

'Alba cintra plena' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942, without description) = 'Alba Cincta Plena'.

'Alba Floribunda' (*C. japonica alba floribunda* Carrière, Rev. Hort. **1889:** 496. 1889). Flowers white tinted with pink, single, very numerous. English cultivar, introduced before 1889.

'Alba Grandiflora' (Carrière, Rev. Hort. **1876:** 410. *pl.* 1876). Shrub almost spineless; flowers pure white, large, single. Raised from seed by Carrière in Paris, France, in 1869.

'Alba grandiflora Carrierei' (*C. japonica alba grandiflora Carrierei* Morel, Rev. Hort. **1909:** 277. 1909) = 'Alba Grandiflora'.

'Alba Grandiflora Plena' (*Cydonia japonica alba grandiflora plena* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers large, white tinted with pink, semidouble. Selection of Otto Froebel, before 1872.

'Alba odorans' (Anonymous, Jour. Hort. Prat. Belg. **14:** 265. 1856–57, without description) = 'Flore Albo Fructu Odorata'.

'Alba Picta' (*C. japonica alba picta* Späth Nurs., Berlin, Germ., Cat. 1887). Flowers white tinted with rose-pink, single. Selection of Ludwig Späth, before 1887.

'Alba plena' (Carrière, Rev. Hort. **1886:** 182. 1886) = 'Alba Grandiflora Plena'.

'Alba punctata rosea' (*C. japonica alba punctata rosea* Letellier Nurs., Caen, Fr., Cat. 1897) = 'Alba Rosea'.

'Alba Rosea' (Wister, Swarthmore Pl. Notes **1942:** 126. 1942, without description). Flowers white, outer side rose-pink, single; fruits ovoid, calyx accrescent. Selection of Ludwig Späth, Berlin, Germany, before 1897, under the name 'Albo-rosea'.

'Alba Semiplena' (*Cydonia japonica alba semiplena* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers white tinted with pink, semidouble; fruits apple shaped, umbilicate. Selection of Otto Froebel, before 1873.

'Alba Simplex' (*C. japonica alba simplex* Parsons Nurs., Flushing, N. Y., Cat. 1873). Flowers white, single. Probably selection of Parsons Nurseries, before 1873.

'Alba variegata' (*C. japonica alba variegata* Simon-Louis Nurs., Metz, Fr., Cat. 1886–87, without description; *ibid.*, Cat. 1900–01, with description) = 'Variegata'.

'Albicans' (Vollert Nurs., Lübeck, Germ., Cat. 1899–1900) = 'Candidissima'.

'Albiflora' (*Cydonia speciosa* var. β *albiflora* Guimpel *et. al.*, Abbild. Fremd. Holzg. **1:** 88. 1825) = 'Candidissima'.

'Albipicta' (*C. japonica albipicta* Späth Nurs., Berlin, Germ., Cat. 1930) = 'Alba Picta'.

'Albo-cincta' (*Cydonia japonica albo-cincta* Van Houtte, Flore des Serres **14:** 23. *pl. 1403.* 1861) = 'Alba Cincta'. The name used in the title is 'Albo-cincta', while the name under the plate is 'Rosalba'.

'Albo-picta' (*C. japonica albo-picta* Späth Nurs., Berlin, Germ., Cat. 1915–16) = 'Alba Picta'.

'Albo-rosea' (*Cydonia japonica albo-rosea* Muth, Gartenw. **7:** 113. 1902) = 'Alba Rosea'.

'Angustifolia' (*Chaenomeles angustifolia* Koidzumi, Jour. Coll. Sci. Tokyo **34**(2): 97. 1913). Leaves very narrow, up to 7 cm. long, 15 mm. broad; flowers white, single; fruits ovoid. Described as a "species" by Koidzumi, it proves from the study of herbarium specimens to be only a cultivar of **C. speciosa**. In Japanese gardens.

'Apple Blossom' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1937:** 11. 1937). Flowers white, tinted with pink and lemon, single or often semi-double; fruits ovoid or apple shaped, calyx accrescent. Selection of the Leonard Nursery, Piqua, Ohio, before 1932. It is not a synonym of 'Moerloosei'.

'Apple Blossom Pink' (Leonard Nurs., Piqua, Ohio, Cat. 1932) = 'Apple Blossom'.

'Atrococcinea' (*C. japonica atrococcinea* Morel, Rev. Hort. **1909:** 277. 1909). Flowers red, single; fruits ovoid or apple shaped, umbilicate. Origin unknown, before 1909.

'Atrococcinea flore pleno' (Van Geert Nurs., Anvers, Belg., Cat. 1893) = 'Atrococcinea Plena'.

'Atrococcinea Plena' (*Cydonia japonica atrococcinea plena* Van Houtte Nurs., Ghent, Belg., Cat. 1869, without description; Späth Nurs., Berlin, Germ., Cat. 1890, with description). Flowers red, semidouble; fruits small, apple shaped, ribbed, umbilicate. Probably selection of Louis van Houtte, before 1869.

'Atrococcinea Semi-plena' (*C. japonica atrococcinea semi-plena* Simon-Louis Nurs., Metz, Fr., Cat. 1886–87, without description; *ibid.*, Cat. 1900–01, with description). Flowers red, semidouble. Probably selection of Simon-Louis Nursery, before 1886.

'Atropurpurea' (Goldring, Garden **40:** 127. 1891) = 'Atrosanguinea'.

'Atrosanguinea' (*Cydonia japonica* var. *atrosanguinea* Lemaire, Ill. Hort. **3:** 107. 1856). Flowers "blood-red," single. Selection of Moerloose, Ledeberg, Belgium, before 1856. It is not a synonym of 'Simonii'.

'Atrosanguinea' (*C.* × *superba* var. *atrosanguinea* Wyman, Am. Nurs. May 1, **1961:** 95. 1961) = 'Simonii'.

'Atrosanguinea flore plena' (Bay State Nurs., N. Abington, Mass., Cat. 1899) = 'Atrosanguinea Plena'.

'Atrosanguinea Plena' (*Cydonia japonica atrosanguinea plena* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers bright red, semidouble. Selection of Otto Froebel, before 1880. Similar to 'Simonii'.

'Aurantiaca' (*C. japonica aurantiaca* Prince Nurs., Flushing, N. Y., Cat. 1856) = 'Flore Rubro Aurantiaca'.

'Aurantiaca Semiplena' (*Cydonia japonica* var. *aurantiaca semiplena* Lemaire, Ill. Hort. **3:** 107. 1856). Flowers small, orange-red, semidouble. Selection of Moerloose, Ledeberg, Belgium, before 1856.

'Aurea' (*C. japonica aurea* Parsons, Flushing, N. Y., Cat. 1873, without description) = 'Sulphurea Perfecta'.

'Aurora' (*C. japonica aurora* Lebas, Rev. Hort. **1868:** 320. 1868). Flowers rose-pink suffused with yellow, single; fruits large, orange shaped, umbilicate. Origin unknown, before 1868.

'Baltzii' (Späth Nurs., Berlin, Germ., Cat. 1887). Flowers rosy red, single; fruits apple shaped, umbilicate. Selection of Ludwig Späth, introduced 1885. Named for Mr. Baltz, former head gardener of Späth Nurseries.

'Blood Red' (Leonard Nurs., Piqua, Ohio, Cat. 1933). Flowers deep "blood-red," single; fruits large, apple to orange shaped, umbilicate. Origin unknown, before 1933. It is not a synonym of 'Rubra Grandiflora' from which it differs by the consistently broader leaves.

'Blush' (Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1870) = 'Candidissima'.

'Blush Japan' (Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1867) = 'Candidissima'.

'Bonfire' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1935). Flowers rose-pink, single; fruits large, ovoid, umbilicate. Origin unknown, before 1935.

'Boule de Feu' (Princeton Nurs., Princeton, N. J., Retail Price List 1941, without description; *ibid.*, Wholesale Price List 1946, with description) = 'Fireball'.

'Brillant' (Hemeray Aubert Nurs., Orléans, Fr., Cat. 1956) = 'Brilliant'.

'Brilliant' (Leonard Nurs., Piqua, Ohio, Cat. 1939). Flowers varying from rose-pink to rosy red, single; fruits apple shaped, umbilicus pointed. Origin unknown, before 1939.

'Bugeauti' (*C. japonica Bugeauti* Anonymous, hand-written cat. of Arboretum Segrezianum, Segrez, Fr., 1877, without description). Flower color and origin unknown, probably a French cultivar, before 1877.

'Camellia-Bloemige' (cult. at the Villa Taranto Gard., Pallanza, It.) = 'Camelliiflora'.

'Camelliaefolia' (Nicholson, Kew Hand List, ed. 2. 323. 1902, without de-

scription). This list gives as a synonym *Pyrus japonica* of plate 692 in the Botanical Magazine. Since this plate typifies *Chaenomeles speciosa*, the cultivar 'Camelliaefolia' = **C. speciosa** var. **speciosa.**

'Camelliiflora' (Späth Nurs., Berlin, Germ., Cat. 1910–11). Flower color and origin unknown, before 1910.

'Candicans' (*Pyrus japonica candicans* Nicholson, Kew Hand List, ed. 1. 193. 1894, without description; Hesse Nurs., Weener-Ems, Germ., Cat. 1903–04). Shrub of medium height; buds pinkish; flowers creamy white, single. Origin unknown, before 1894.

'Candida' (*C. japonica candida* Lebas, Rev. Hort. **1868:** 320. 1868). Flowers pure white, single; fruits apple shaped, umbilicate. Origin unknown, before 1868.

'Candidissima' (Defossé-Thuillier Nurs., Orléans, Fr., Cat. 1874, without description; Andorra Nurs., Philadelphia, Pa., Cat. 1906, with description). Flowers white tinted with pink, single. The name 'Candidissima' has replaced older names applied to the same cultivar. Already known in Europe in 1813. Probably introduced from Japanese gardens.

'Candidissimum' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942, without description) = 'Candidissima'.

'Cardinalis' (*C. japonica* var. *cardinalis* Lemaire, Ill. Hort. **3:** sub *pl. 107.* 1856). Flowers bright red, single or semidouble; fruits apple shaped, umbilicus pointed. Selection of Moerloose, Ledeberg, Belgium, around 1855. 'Cardinalis' which originated as a chance seedling in Europe, has been elevated to the rank of species by Nakai, Bot. Mag. Tokyo **32:** (145). 1918. This "species" was based on the figure published by Carrière, Rev. Hort. **1872:** 331, *f. 1.* 1872, and maintained because the plant was thought to grow wild in China and on one of the Japanese islands. This latter information from a native collector proved to be erroneous, and, although Japanese authors continue to treat it as a species, it is, in fact, a cultivar of garden origin.

'Carnea' (*C. japonica carnea* Lebas, Rev. Hort. **1868:** 320. 1868). Flowers white tinted with pink, single; fruits orange shaped, umbilicate. Origin unknown, before 1868.

'Carnea Plena' (Parsons Nurs., Flushing, N. Y., Cat. 38–39, prob. 1887–89). Flowers "flesh" colored, double. Origin unknown, before 1887.

'Citripoma' (*Cydonia citripoma* [*Chaenomeles citripomma*] Carrière, Rev. Hort. **1876:** 330, *pl.* 1876). Flowers rosy red, single; fruits large, ovoid, ribbed, calyx accrescent. Raised from seed by Carrière in Paris, France, in 1869.

'Coccinea' (*Cydonia japonica* var. *coccinea* Lemaire, Ill. Hort. **3:** 107. 1856). Flowers bright red, single. Selection of Moerloose, Ledeberg, Belgium, around 1855.

'Coccinea erecta' (Princeton Nurs., Princeton, N. J., Cat. 1934) = 'Coccinea'.

'Coccinea plena' (*C. japonica coccinea plena* Minier Nurs., Angers, Fr., Cat. 1960) = 'Atrococcinea Plena'.

'Contorta' (*C. superba contorta* Clarke Nurs., San Jose, Calif., Gard. Aristocrats **9:** 18. 1942). Branches and spines tortuous; flowers white tinted with pink; fruits apple shaped or slightly ovoid, calyx accrescent. This cultivar was imported from Japan by Toichi Domoto Nursery, Haywood, California, about 1929. At the International Flower Show in New York in March, 1936, it was awarded a Silver Medal. 'Contorta', in Japan, is called 'Rinho' which is a sport of 'Tatsugashira'.

'Dark Crimson' (*C. japonica* Dark Crimson, Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1867) = 'Atrosanguinea'.

'Deep Pink' (cult. at the Arnold Arboretum, Jamaica Plain, Mass., from Jones Nurs., Nashville, Tenn., since 1950). Flowers small, "deep pink," single; fruits apple shaped, umbilicate. Origin unknown, before 1950.

'Doctor Bang's Pink' (cult. at the Mich. State Univ., East Lansing, Mich., and at the Univ. of Minn., St. Paul, Minn.). Flowers salmon-pink, single; fruits small, orbicular, umbilicus wide and protuberant. Selection of Interstate Nurseries, Hamburg, Iowa. Named for Dr. Bang of Hamburg, Iowa, in whose garden it was found, before 1955.

'Dolichocarpa' (*C. japonica dolichocarpa* Depken, Mitt. Deutsch. Dendr. Ges. **22:** 321, *f.* 1913). No flower color indicated; fruits pear shaped. The original shrub was raised from seed in Oberneuland, Germany, before 1913.

'Double Flowering' (Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1867) = 'Rubra Semiplena'.

'Double Scarlet' (Strong Nurs., Brighton, Mass., Cat. 1872) = 'Rubra Plena'.

'Dr. Bang's Pink' (cult. at the Mich. State Univ., East Lansing, Mich., and at the Univ. of Minn., St. Paul, Minn.) = 'Doctor Bang's Pink'. According to a recommendation of the International Code of Nomenclature for Cultivated Plants, names beginning with abbreviations should be avoided.

'Dwarf Red' (Anonymous, Jour. Roy. Hort. Soc. **77:** lxxxiv. 1952, without description). Flowers coral-red, single. Selection of Lady Cranborne, Hatfield, England, before 1952.

'Eburnea' (Carrière, Rev. Hort. **1872:** 331. *f. 4.* 1872). Flowers small, pure white, single. Carrière wrote "Japanese species (?) introduced by the late Siebold." On this information, Nakai, Bot. Mag. Tokyo **32:** 146. 1918, based *Chaenomeles eburnea* (Carr.) Nakai. Since the species does not occur wild in Japan, he gave as its origin China, with a question mark. This plant does not occur in China either, and is only a garden form differing from the typical form of the species in its white flowers, glabrous styles, and narrower leaves. It should be considered a cultivar.

'Echo' (H. R. Kemmerer & J. C. McDaniel, Am. Nurs. May 1, **1961:** 55. 1961). Flowers claret-rose and rosy red, single. Selection no. 12 of Dr. A. Colby of the University of Illinois, introduced 1961.

'Emilie Soutzo' (Parsons Nurs., Flushing, N. Y., Cat. 1895) = 'Princesse Emilie Soutzo'.

'Eugenioides' (*C. eugenioides* Koidzumi, Bot. Mag. Tokyo **29:** 160. 1915). This "species" of Koidzumi is cited by Nakai, Bot. Mag. Tokyo **32:** 146. 1918,

as a synonym of the cultivar 'Alba rosea'. Iwata, Jour. Agr. Sci. [Setagaya] **5**(4): 38. 1960, cites it in the synonymy of *C. cardinalis* Carrière, which has red, often semidouble flowers, very different from 'Eugenioides' with white, pink-tinted, single flowers. It is probably better treated as a cultivar = 'Alba Rosea'.

'Euphrosyne' (Cheal Nurs., Crawley, Engl., Cat. 1931–32). Flowers pure white, single. Selection of the Cheal Nursery, before 1931.

'Exilis' (*Cydonia japonica exilis* Siebold, Jaarb. Kon. Ned. Maatsch. **1844:** 27. 1844, without description). Introduced by P. F. von Siebold from Japan, in 1843.

'Eximia' (*Cydonia japonica eximia* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description; Späth Nurs., Berlin, Germ., Cat. 1890, with description). Flowers pink to rosy red; fruits orange shaped, umbilicate. Selection of Otto Froebel, before 1880. Similar to 'Umbilicata'.

'Extus' (Duncan & Davies Nurs., New Plymouth, N. Z., Cat. 1926) = 'Nivea Extus Coccinea'.

'Extus coccinea' (*C. japonica* var. *extus coccinea* Carrière, Rev. Hort. **1872:** 331, *f.* 3. 1872). This Belgian variety selected before 1867 under the name of 'Nivea Extus Coccinea' was redescribed and illustrated by Carrière who named it 'Extus coccinea'. From Carrière's description, Nakai, Jap. Jour. Bot. **4:** 330. 1929, elevated it to the rank of species where it has been maintained by Japanese authors until now, chiefly on the basis of the character of the woolly styles. 'Extus coccinea' is a cultivar which appeared in Belgium in a batch of seedlings, and should correctly be called 'Nivea Extus Coccinea'.

'Falconnet' (Falconnet Nurs., Thoissey, Fr., Cat. 1960) = 'Falconnet Charlet'.

'Falconnet Carlet' (Anonymous, Jaarb. Boskoop **1954:** 116. 1954) = 'Falconnet Charlet'.

'Falconnet Charlet' (Barbier Nurs., Orléans, Fr., Cat. 1915, without description; Duncan & Daires, New Plymouth, N. Z., Cat. 1926, with description). Flowers pink tinted with rose-pink, semidouble; fruits large, apple shaped, umbilicate. Selection of Falconnet Nursery, Thoissey, France, before 1900. This is not a synonym of 'Cameo', or of 'Rosea Plena'.

'Falconnet Charlet' (Kohankie Nurs., Painesville, Ohio, Cat. 1938) = 'Nivalis'.

'Falconnet Charlot' (Jackman Nurs., Woking, Engl., Cat. 1936–37) = 'Falconnet Charlet'.

'Falconnet Charlot' (Kohankie Nurs., Painesville, Ohio, Cat. 1945–46) = 'Nivalis'.

'Falconnet Scarlet' (Delaunay Nurs., Angers, Fr., Cat. 1959–60) = 'Falconnet Charlet'.

'Fastigiata' (*C. japonica fastigiata* A. Leroy Nurs., Angers, Fr., Cat. 1873). Branches fastigiate. Color of the flowers and origin unknown, before 1873.

'Fireball' (formerly 'Boule de Feu', a name retained for another cultivar. Cult. at the Planting Fields Arb., Oyster Bay, L.I., N. Y., from Princeton

Nurs., Princeton, N. J.). Flowers flame-red, semidouble; fruits large, apple shaped, upper depression very broad, terminating in a narrow tip. This cultivar was confused with 'Boule de Feu' which belongs to the Superba group and possesses single flowers. We propose to translate this French name to 'Fireball', its English equivalent. May have originated in England, before 1940.

'Flora carnea' (Simon-Louis Nurs., Metz, Fr., Cat. 1911–12) = 'Carnea'.

'Flore albo' (*Cydonia japonica flore albo* Loudon, Arb. & Frut. Brit., 932. 1838) = 'Candidissima'.

'Flore Albo Fructu Odorata' (*Cydonia japonica flore albo fructu odorata* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53). Flowers white tinted with pink, single; fruits very fragrant. Selection of Moerloose, Ledeberg, Belgium, before 1852.

'Flore Albo Inermis' (*Cydonia japonica flore albo inermis* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53). Shrubs spineless; flowers white tinted with pink, single. Selection of Moerloose, Ledeberg, Belgium, before 1852.

'Flore albo pleno' (*Cydonia japonica flore albo pleno* L. Leroy Nurs., Angers, Fr., Cat. 1872) = 'Alba Grandiflora Plena'.

'Flore albo semipleno' (*C. japonica flore albo semipleno* A. Leroy Nurs., Angers, Fr., Cat. 1873) = 'Alba Semiplena'.

'Flore atrosanguinea' (*Cydonia japonica flore atrosanguinea* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53) = 'Atrosanguinea'.

'Flore aurantiaca' (*Cydonia japonica flore aurantiaca* Papeleu Nurs., Ledeberg, Belg., Cat. 1856–57) = 'Flore Rubro Aurantiaca'.

Flore carneo' (*Cydonia japonica flore carneo* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53) = 'Carnea'.

'Flore coccineo' (*Cydonia japonica flore coccineo* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53) = 'Coccinea'.

'Flore kermesino' (*Cydonia japonica flore kermesino* Späth Nurs., Berlin, Germ., Cat. 1887) = 'Kermesina Semiplena'.

'Flore plena' (*C. japonica flore plena* Waterer's Nurs., Twyford, Engl., Cat. 1938–39) = 'Rosea Plena'.

'Flore plena rosea' (*C. japonica flore plena rosea* Hillier Nurs., Winchester, Engl., Cat. 1942) = 'Rosea Plena'.

'Flore pleno' (*Cydonia japonica flore pleno* Waterer's Nurs., Woking, Engl., Cat. 1851, without description) = 'Rubra Plena'.

'Flore pleno' (*Cydonia japonica flore pleno* Hillier Nurs., Winchester, Engl., Cat. 1930) = 'Rosea Plena'.

'Flore purpurea' (*C. japonica flore purpurea* Weisse Nurs., Kamenz, Germ., Cat. 1895) = 'Atrosanguinea'.

'Flore rosea plena' (*C. lagenaria flore rosea plena* Sheridan Nurs., Clarkson, Can., Cat. 1961) = 'Rosea Plena'.

'Flore Roseo' (*Cydonia japonica flore roseo* Siebold, Jaarb. Kon. Ned. Maatsch.

**1844:** 27. 1844, without description; Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53, with description). Flowers pink, single. Introduced from Japan by P. F. von Siebold, in 1830.

'Flore rubro' (*Cydonia japonica flore rubro* Siebold, Jaarb. Kon. Ned. Maatsch. **1844:** 27. 1844) = 'Rubra'.

'Flore Rubro Aurantiaca' (*Cydonia japonica flore rubro aurantiaca* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53). Flowers orange-scarlet, single. Selection of Moerloose, Ledeberg, Belgium, before 1852.

'Flore rubro pleno' (*Cydonia japonica flore rubro pleno* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53) = 'Rubra Plena'.

'Flore semi-pleno' (*Cydonia japonica flore semi-pleno* Loudon, Arb. & Frut. Brit., 932. 1838) = 'Rubra Semiplena'.

'Floribunda' (*C. lagenaria floribunda* Bean, Kew Hand List, ed. 3. 139. 1925) = 'Alba Floribunda'.

'Floribus puniceis' (*Cydonia japonica* var. *β floribus puniceis* Siebold, Syn. Pl. Oecon. Univ. Regn. Jap. **12:** 67. 1830) = 'Rubra'.

'Floribus roseis' (*Cydonia japonica* var. *α floribus roseis* Siebold, Syn. Pl. Oecon. Univ. Regn. Jap. **12:** 67. 1830) = 'Flore Roseo'.

'Foliis Variegatis' (*C. japonica foliis variegatis* A. Leroy Nurs., Angers, Fr., Cat. 1873), leaves "variegated." Flower color and origin unknown, before 1873.

'Fructa odoratissima' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942) = 'Flore Albo Fructu Odorata'.

'Fructico odoratissima' (Wister, Swarthmore Pl. Notes **1955:** 212. 1955) = 'Flore Albo Fructu Odorata'.

'Fructu odoratissimo' (*Cydonia japonica fructu odoratissimo* Lemaire, Ill. Hort. **3:** 107. 1856) = 'Flore Albo Fructu Odorata'.

'Gandavensis' (*C. japonica gandavensis* Anonymous [list of C. Baltet], Garden **13:** 44. 1878, without description). Flower color and origin unknown, probably a Belgian cultivar, before 1878. Named for the city of Ghent in Belgium.

'Gaujardii' (*Cydonia japonica Gaujardii* Lemaire, Ill. Hort. **7:** 260. *f. 1.* 1860). Flowers salmon- to coral-pink, single; fruits small, apple shaped, slightly ribbed, upper depression ending in a narrow tip. Selection of Moerloose, before 1860. Named for Mr. Rome Gaujard, horticulturist at Châteauroux, France.

Var. *genuina* (*Chaenomeles japonica* var. *α genuina* Maxim. Bull. Acad. Sci. St. Petersb. **19:** 168. 1873) = **C. speciosa.**

'Gigantea' (*C. japonica gigantea* Prince Nurs., Flushing, N. Y., Cat. 1856). Shrub vigorous; flowers light scarlet-red, single. Origin unknown, before 1856.

'Grandiflora' (*Cydonia japonica grandiflora* Van Houtte Nurs., Ghent, Belg., Cat. 1869, without description; Parsons Nurs., Flushing, N. Y., Cat. 1879, with description). Flowers large, white tinted with pink and lemon, single

or slightly semidouble; fruits large, ovoid, calyx accrescent. Origin unknown, before 1869.

'Grandiflora' (*C. japonica grandiflora* Späth Nurs., Berlin, Germ., Cat. 1893) = 'Alba Grandiflora'.

'Grandiflora plena' (*C. japonica grandiflora plena* Goldring, Garden **40:** 127. 1891) = 'Alba Grandiflora Plena'.

'Grandiflora rosea' (*Cydonia japonica grandiflora rosea* L. Leroy Nurs., Angers, Fr., Cat. 1913, without description) = 'Rosea Grandiflora'.

'Grandiflora roseo-semiplena' (*C. japonica grandiflora roseo-semiplena* Späth Nurs., Berlin, Germ., Cat. 1915–16) = 'Rosea Semiplena'.

'Grandiflora rubra' (*Cydonia japonica grandiflora rubra* Lemaire, Ill. Hort. **3:** 107. 1856) = 'Rubra Grandiflora'.

'Grandiflora semiplena' (*C. lagenaria grandiflora semiplena* Colby, Trans. Ill. Acad. Sci. **21:** 184. 1929) = 'Rosea Semiplena'.

'Hanazono' (*Cydonia japonica* Hanazono, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers red, single; fruits ovoid or apple shaped, calyx accrescent. Selection of K. Wada, Hakoneya Nurseries, before 1936. Hanazono means flower garden.

'Histrix' (*C. japonica histrix* Simon-Louis Nurs., Metz, Fr., Cat. 1886–87, without description; *ibid.*, Cat. 1900–01, with description). Flowers soft pink, single. Origin unknown, before 1886.

'Ignea' (*C. japonica ignea* Simon-Louis Nurs., Metz, Fr., Cat. 1886–87, without description; *ibid.*, Cat. 1900–01, with description). Flowers "fire-red," single. Origin unknown, before 1886.

'Ignis' (*C. japonica ignis* Letellier Nurs., Caen, Fr., Cat. 1897) = 'Ignea'.

'Imbricata' (Carrière, Rev. Hort. **1886:** 182. 1886) = 'Umbilicata'.

'Inermis' (*Cydonia japonica inermis* Anonymous, Jour. Hort. Prat. Belg. **14:** 265. 1857) = 'Flore Albo Inermis'.

'Japan Blush' (Parsons Nurs., Flushing, N. Y., Cat. 1840) = 'Candidissima'.

'Japanese Scarlet' (*C. japonica* Japanese Scarlet, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1934:** 15. 1934). Flowers pink and rose-pink, single; fruits apple shaped, umbilicate. Origin unknown, before 1934.

'Japan Scarlet' (*Cydonia japonica* Japan Scarlet, Parsons Nurs., Flushing, N. Y., Cat. 1840) = 'Rubra'.

'Japan White' (California Nurs., Niles, Calif., Cat. 1888, without description; *ibid.*, Cat. 1897, with description) = 'Candidissima'.

'Jimmy's Choice' (Anonymous, Am. Nurs. July 1, **1960:** 48. 1960, without name). Shrub with a spreading and twisting habit of growth; flowers large, white shading to rose-pink and rosy red, single. Selection of James J. Kelley, New Canaan, Connecticut, not available yet in the trade. Plant patent no. 1940 taken on June 15, 1960.

'Kan-Toyo-Nishiki' (Hakoneya Nurs., Numazu-shi, Jap. "Jap. Gard. Treasures"

1941). Winter bloomer; flowers white, white-and-pink, pink or red, on the same branch, single. Selection of K. Wada, Hakoneya Nurseries, before 1941. Kan-Toyo-Nishiki means mid-winter Toyo-Nishiki, this cultivar being a winter-flowering form of 'Toyo-Nishiki'.

'Kermesiana semi-plena' (Kingsville Nurs., Kingsville, Md., Cat. 1947) = 'Kermesina Semiplena'.

'Kermesina' (*C. japonica kermesina* Späth Nurs., Berlin, Germ., Cat. 1915–16). Flowers "carmine" red, single. Origin unknown; Ludwig Späth says "Hort.," before 1915.

'Kermesina Semiplena' (Späth Nurs., Berlin, Germ., Cat. 1890). Flowers salmon to rose-pink, semidouble; fruits small, ovoid, slightly ribbed, umbilicate. Selection of Ludwig Späth, before 1887.

'Knap Hill Radiance' (*C. lagenaria* Knap Hill Radiance, Anonymous, Jour. Roy. Hort. Soc. **73:** 353. 1948). Flowers large, geranium-red, single. Selection of Knap Hill Nursery, before 1948. Award of Merit from the Royal Horticultural Society on April 6, 1948.

'Kokko' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers dark red, single or semidouble. Selection of K. Wada, Hakoneya Nurseries, before 1936. Kokko means national glory.

'Kokuko' (*Cydonia japonica* Kokuko, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). This name was corrected by the Hakoneya Nurseries to 'Kokko'.

'Lady Emily Swartz' (cult. at the Arnold Arb., Jamaica Plain, Mass., from Parsons Nurs., Flushing, N. Y., in 1884, now dead). Flower color and origin unknown, before 1884.

Var. *lagenaria* (*Cydonia japonica* var. *β lagenaria* Makino, Bot. Mag. Tokyo **22:** 64. 1908) = **Chaenomeles speciosa.**

'Leonard's Variety' (Wyman, Am. Nurs. May 1, **1961:** 97. 1961) = 'Leonard's Velvety'.

'Leonard's Velvety' (Leonard Nurs., Piqua, Ohio, Cat. 1932). Flowers large, "velvety" red, single; fruits obovoid, slightly ribbed, umbilicus terminated in a narrow tip. Selection of Leonard Nursery, introduced 1932.

'Limoni' (cult. at the Nat. Arb., Washington, D. C.). Flower color and origin unknown, before 1960. From examination of sterile material, it does not seem to be a synonym of 'Simonii'.

'Lutea' (*Cydonia japonica lutea* Prince Nurs., Flushing, N. Y., Cat. 1844). Flowers creamy yellow, single. Origin unknown, before 1844.

'Lutea Macrantha' (*C. japonica lutea macrantha* Van Houtte Nurs., Ghent, Belg., Cat. 1869, without description; Späth Nurs., Berlin, Germ., Cat. 1890, with description). Flowers large, creamy yellow, single. Origin unknown, before 1869.

'Lutea Viridis' (*C. japonica lutea viridis* Van Houtte Nurs., Ghent, Belg., Cat. 1869, without description; A. Leroy Nurs., Angers, Fr., Cat. 1873, with description). Flowers greenish white turning pink, single. Origin unknown, before 1869.

'Macrantha' (*C. japonica macrantha* Simon-Louis Nurs., Metz, Fr., Cat. 1886–87, without description; *ibid.*, Cat. 1900–01, with description). Flowers large, red, single. Origin unknown, before 1886.

'Macrocarpa' (*Cydonia japonica macrocarpa* Papeleu Nurs., Ledeberg, Belg., Cat. 1856–57, without description; Anonymous, Jour. Hort. Prat. Belg. **14:** 265. 1857, with description). Flowers rosy red, single; fruits medium, apple shaped, umbilicate. Selection of Moerloose, Ledeberg, Belgium, before 1852.

'Maerloosii' (*C. japonica Maerloosii* Parsons, Flushing, N. Y., Cat. 1873) = 'Moerloosei'.

'Maillardii' (*C. japonica Maillardii* Prince Nurs., Flushing, N. Y., Cat. 1860, without description) = 'Mallardii'.

'Mallardii' (Courtin, Ill. Gart. Zeit. **1:** 208, *pl.* 1857). Flowers rose-pink in the center, white on the edges, single. Selected by Mallard, amateur gardener at Sarthe, France, before 1857.

'Mallardii' (Beckett, Garden **71:** 262. 1907). Flowers creamy white, single. This is the 'Mallardii' offered by European nurserymen now, and grown in arboreta in the United States. The first 'Mallardii' still being in cultivation, a second should not be grown under the same name. We propose to call it 'Mallarot', a name used by Delaunay Nurseries for the same cultivar.

'Mallarot' (formerly 'Mallardii', a name retained for another cultivar). Flowers creamy white, single. Origin unknown, before 1907.

'Mallordi' (Hesse Nurs., Weener-Ems, Germ., Cat. 1903–04) = 'Mallardii'.

'Mallordu' (name in an unpublished list of Dr. H. R. Kemmerer, Univ. of Ill.) = 'Mallardii'.

'Marmorata' (*C. japonica marmorata* Späth Nurs., Berlin, Germ., Cat. 1887). Flowers white-and-pink "marbled," single; fruits apple shaped. Selection of Ludwig Späth, before 1887.

'Millardi' (Duncan & Davies Nurs., New Plymouth, N. Z., Cat. 1926) = 'Mallardii'.

'Moerheimii' (*C. japonica Moerheimii* Faulkner, Gard. Chron. III. **109:** 245. 1941, without description; Osborn, Gard. Chron. III. **111:** 225. 1942, with description) = 'Moerloosei'.

'Moerloesi' (*C. lagenaria Moerloesi* Anonymous, Jour. Roy. Hort. Soc. **82:** 308. 1957) = 'Moerloosei'.

'Moerloosei' (*Cydonia japonica Moerloosei* Grignan, Rev. Hort. **1903:** 20. 1903). Flowers white striped rose-pink, single; fruits more or less ovoid. Selection of Moerloose, Ledeberg, Belgium, before 1856. Named by A. Papeleu 'Moerloosii' for Moerloose, horticulturist who originated many cultivars in *Chaenomeles*. The name 'Moerloosii' was later corrected to 'Moerloosei'. Award of Merit of the Royal Horticultural Society in 1957.

'Moerloosii' (*Cydonia japonica Moerloosii* Lemaire, Ill. Hort. **3:** 107. 1856) = 'Moerloosei'.

'Moerlosii' (Carrière, Rev. Hort. **1886:** 182. 1886) = 'Moerloosei'.

'Moerlozi' (*C. japonica Moerlozi* California Nurs., Niles, Calif., Cat. 1908–09) = 'Moerloosei'.

'Moorlosii' (Mouillefert, Traité Arb. & Arbriss. **1:** 540. 1892) = 'Moerloosei'.

'Monstruosa' (*C. japonica monstruosa* A. Leroy Nurs., Angers, Fr., Cat. 1873, without description). Flower color and origin unknown, before 1873.

'Multiflora' (Barbier Nurs., Orléans, Fr., Cat. 1896, without description) = 'Atrococcinea'.

'Nana' (*Cydonia japonica nana* Lemaire, Ill. Hort. **3:** 107. 1856) = 'Umbilicata Nana'.

'Nana compacta' (*C. japonica nana compacta* Van Houtte Nurs., Ghent, Belg., Cat. 1867, without description) = 'Umbilicata Nana'.

'Navel' (Manning, Pl. Buyer's Index 1926, without description) = 'Umbilicata'.

'Nivalis' (*C. japonica nivalis* Lemoine Nurs., Nancy, Fr., Cat. 1881, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers pure white, single; fruits apple shaped, umbilicate. Origin unknown, before 1881.

'Nivalis major' (Bunyard, Planters' Handbook 86. 1908) = 'Nivalis'.

'Nivea' (A. Leroy Nurs., Angers, Fr., Cat. 1873). Flowers pure white, single. Origin unknown, before 1873.

'Nivea coccinea' (*C. japonica nivea coccinea* L. Leroy Nurs., Angers, Fr., Cat. 1876, without description; Späth Nurs., Berlin, Germ., Cat. 1931–32, with description) = 'Nivea Extus Coccinea'.

'Nivea Extus Coccinea' (Van Houtte Nurs., Ghent, Belg., Cat. 1867, without description; Lebas, Rev. Hort. **1868:** 320. 1868, with description). Flowers white with deep pink outer petals, single. Belgian cultivar, selected before 1867.

'Nivea Intus Kermesina' (Späth Nurs., Berlin, Germ., Cat. 1887). Flowers white flecked with rose-pink, single. Origin unknown, before 1887.

'Orange Scarlet' (*C. japonica* Orange Scarlet, Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1867) = 'Flore Rubra Aurantiaca'.

'Ormond Crimson' (Harrison, Handb. Trees & Shrubs South. Hem. 87. 1959). Flowers deep red, double. Selection of the Ormond Plant Farm, Ormond, Australia, before 1959. Named for its place of origin. This is a seedling of 'Falconnet Charlet'.

'Ormond Scarlet' (Harrison, Handb. Trees & Shrubs South. Hem. 87. 1959). Flowers scarlet-red, double. Selection of the Ormond Plant Farm, Ormond, Australia, before 1959. Named for its place of origin. This is a seedling of 'Falconnet Charlet'.

'Pacific Red' (*C. lagenaria* Pacific Red, Natorp Nurs., Cincinnati, Ohio, Cat. 1956). Flowers pink to red, single; fruits orange shaped, umbilicate. Selection of the Natorp Nursery, before 1956.

'Papeleui' (*Cydonia japonica Papeleui* Lemaire, Ill. Hort. **7:** 260. *f.* 2. 1860). Flowers creamy yellow bordered pink, single; fruits orange shaped, umbili-

cate. Belgian selection named for Adolf Papeleu, horticulturist at Ledeberg, Belgium, who introduced most of Moerloose's selections, 1860.

'Pedunculata' (*C. japonica pedunculata* Carrière, Rev. Hort. **1877:** 192. *f.* 34. 1877). Flowers rosy red, single; fruits pear shaped, umbilicate, "borne on a peduncle about 15 mm. long." The long peduncle, a character relatively common to a great many cultivars, indicates that the fruit came from summer flowers.

'Pendula' (*Cydonia japonica* var. *pendula* Rehder in Bailey, Cycl. Am. Hort. **1:** 427. 1900). Branches slender and pendulous. Flower color and origin unknown, before 1900.

'Permesina semi-plena' (Cult. at Longwood Gard., Kennett Square, Pa., and at the Nat. Arb., Washington, D. C.) = 'Kermesina Semiplena'.

'Phylis Moore' (*Cydonia japonica* Phylis Moore, Anonymous, Gard. Chron. III. **91:** 1. *pl.* 1932). Flowers pink and rose-pink, semidouble, fruits ovoid, strongly ribbed, umbilicate. Selection of the Knap Hill Nursery, before 1930. Named for Lady Moore, wife of Sir Frederick Moore, Director, Glasnevin Botanic Garden, Ireland.

'Phyllis Moore' (Krüssmann, Deutsche Baumsch. **4**(4)**:** 88. 1952) = 'Phylis Moore'.

'Pink' (Princeton Nurs., Princeton, N. J., Cat. 1938) = 'Rosea Semiplena'.

'Pinkstripe' (*C. lagenaria* Pinkstripe, Anonymous, Pl. Buyer's Guide, ed. 5. 59. 1949) = 'Moerloosei'.

'Piriformis' (*C. japonica piriformis* Mouillefert, Traité Arb. & Arbriss. **1:** 540. 1892) = 'Pyriformis'.

'Plena' (*Cydonia japonica plena* Prince Nurs., Flushing, N. Y., Cat. 1844) = 'Rubra Plena'.

'Princeps' (*Cydonia japonica princeps* Veitch Nurs., Kingston Hill, Engl., Cat. 1867–68). Flowers deep scarlet-red, single. Probably an English cultivar, before 1867. This is not a synonym of 'Cardinalis'.

'Princess Emile Sontza' (*C. japonica* Princesse Emile Sontza, Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1867) = 'Princesse Emilie Soutzo'.

'Princesse Emilie' (*C. japonica* Princesse Emilie, Parsons Nurs., Flushing, N. Y., Cat. 1873) = 'Princesse Emilie Soutzo'.

'Princesse Emilie Soutzo' (*Cydonia japonica* Princesse Emilie Soutzo, Lemaire, Ill. Hort. **7:** 260. 1860). Flowers dark red, single. Selection of Moerloose, Ledeberg, Belgium, before 1860. Named for the Moldavian Princess, Emilie Soutzo.

'Purpurea' (*C. japonica purpurea* Simon-Louis Nurs., Metz, Fr., Cat. 1886–87, without description; *ibid.*, Cat. 1900–01, with description) = 'Atrosanguinea'.

'Pyriformis' (*C. lagenaria pyriformis* Camus, Arb., Arbust. & Arbriss. Orn. 39. 1923). Flower color unknown; fruits pear shaped. Origin unknown, before 1892. The name was spelled at first 'Piriformis', then corrected to 'Pyriformis'.

'Red' (*C. japonica* red, Parsons Nurs., Flushing, N. Y., Cat. 1875, without description) = 'Rubra'.

'Red Ripples' (Stribbling Nurs., Merced, Calif., Wholesale Price List 1958) = 'Red Ruffles'.

'Red Ruffles' (Clarke Nurs., San Jose, Calif., Wholesale Price List 1951). Branches almost spineless; flowers red, single; fruits ovoid, umbilicate. Selection of W. B. Clarke, introduced 1951. Plant patent no. 941 taken on May 16, 1950. Named 'Red Ruffles' because the overlapping petals produce a "ruffled" effect. The name is registered.[2]

'Red Sprite' (H. R. Kemmerer & J. C. McDaniel, Am. Nurs. May 1, **1961:** 55. 1961). Shrubs compact; flowers rosy red, single. Selection no. 18 of Dr. A. Colby, University of Illinois, introduced 1961.

'Red Upright' (Burwell Nurs., Columbus, Ohio, Price List 1961) = 'Rubra'.

'Rinho' (Ishii, Engei Shokubutsu Zufu 6, no. 1136, var. 12. 1930–34. In the United States it is called 'Contorta'.

'Rosalba' (*Cydonia japonica rosalba* Van Houtte, Flore Serres **14:** *pl. 1403.* 1861) = 'Alba Cincta'. The name appearing under the plate is 'Rosalba' while in the title the given name is 'Albo-cincta'.

'Rosea' (*C. japonica* var. *γ rosea* Roemer, Fam. Nat. Reg. Veg. Syn. Mon., 219. 1847) = 'Flore Roseo'.

'Rosea' (*Pyrus japonica rosea* Van Houtte Nurs., Ghent, Belg., Cat., 1849, without description; Lebas, Rev. Hort. **1868:** 320. 1868, with description) = 'Umbilicata'.

'Rosea flora pleno' (*C. lagenaria rosea flora pleno* Hillier Nurs., Winchester, Engl., Cat. 1958–59) = 'Rosea Plena'.

'Rosea flore plena' (*C. japonica rosea flore plena* Waterer's Nurs., Twyford, Engl., Cat. 1950–51) = 'Rosea Plena'.

'Rosea Grandiflora' (*C. japonica rosea grandiflora* Van Houtte Nurs., Ghent, Belg., Cat. 1869, without description; Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1934:** 15. 1934, with description). Flowers white, white-and-pink with lemon to rose-pink, single; fruits apple shaped, slightly ribbed, umbilicate. Origin unknown, before 1869.

'Rosea grandiflora semiplena' (Späth Nurs., Berlin, Germ., Cat. 1889) ='Rosea Semiplena'.

[2] For a number of years the American Association of Nurserymen performed the service of registering the names of cultivars proposed by American horticulturists. Each cultivar so registered was assigned a number which is often cited in publications as "AAN no. —." In 1958 the Arnold Arboretum assumed this function doing so on behalf of the American Association of Botanical Gardens and Arboretums, designated as the National Registration Authority for special groups of woody cultivated plants by the American Horticultural Society. While so designated the Arnold Arboretum will accept for purposes of registration the names proposed for cultivars in taxa not already assigned to other National or International Registration Authorities. Cultivar names which are to be registered are not assigned numbers but are indicated as "registered" and are recorded in lists published at irregular intervals in issues of ARNOLDIA.

'Rosea Plena' (*Cydonia japonica rosea plena* Anonymous [list of C. Baltet], Garden **13:** 144. 1878, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers pink to coral-pink, semidouble; fruits ovoid, ribbed. Selection of Otto Froebel, Zurich, Switzerland, before 1878. This is not a synonym of 'Falconnet Charlet'.

'Rosea Semiplena' (*Cydonia japonica rosea semiplena* Anonymous [list of C. Baltet], Garden **13:** 144. 1878, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers bright pink, semidouble. Origin unknown, before 1876.

'Rosepink' (*C. japonica* rosepink, Leonard Nurs., Piqua, Ohio, Cat. 1934) = 'Umbilicata'.

'Rosepink' (*Cydonia japonica* rosepink, Leonard Nurs., Piqua, Ohio, Cat. 1937) = 'Marmorata'.

'Rubra' (*C. japonica rubra* L. Leroy Nurs., Angers, Fr., Cat. 1872). Flowers bright red, single. This is probably the original form of **Chaenomeles speciosa,** imported by Banks in 1796, from Japanese gardens. The first name given to this cultivar, 'Rubriflora', has been replaced by 'Rubra'.

'Rubra aurantiaca' (*Cydonia japonica rubra aurantiaca* Anonymous, Jour. Hort. Prat. Belg. **14:** 265. 1857) = 'Flore Rubro Aurantiaca'.

'Rubra aurantiaca duplex nova' (Anonymous, Jour. Hort. Prat. Belg. **14:** 265. 1857) = 'Aurantiaca Semiplena'.

'Rubra Grandiflora' (*C. japonica rubra grandiflora* Van Houtte Nurs., Ghent, Belg., Cat. 1867, without description; Lebas, Rev. Hort. **1868:** 320. 1868, with description). Flowers large, deep crimson-red, single; fruits apple or orange shaped, umbilicate. Selection of Moerloose, Ledeberg, Belgium, before 1857, under the name 'Grandiflora rubra'. This is not a synonym of 'Blood Red'.

'Rubra Plena' (*C. lagenaria rubra plena* Camus, Arb., Arbust. & Arbriss. Orn. 39. 1923). Flowers red, double. Origin unknown, before 1844.

'Rubra pleno' (*Cydonia japonica rubra pleno* Prince Nurs., Flushing, N. Y., Cat. 1856) = 'Rubra Plena'.

'Rubra Semiplena' (*Cydonia japonica rubra semiplena* Lemoine Nurs., Nancy, Fr., Cat. no. 90. 1881, without description; Parsons Nurs., Flushing, N. Y., Descr. Cat. no. 38–39 [prob. 1887–89], with description). Flowers red, semidouble. Origin unknown, before 1887.

'Rubriflora' (*Cydonia speciosa* var. α *rubriflora* Guimpel *et al.*, Abbild. Fremd. Holzg. **1:** 88, *pl. 70.* 1825) = 'Rubra'.

'Rubro-aurantiaca' (*Cydonia japonica rubro-aurantiaca* Lemaire, Ill. Hort. **3:** 107. 1856) = 'Aurantiaca Semiplena'.

'Rubro plena' (*Pyrus japonica rubro plena* Parsons Nurs., Flushing, N. Y., Cat. 1846) = 'Rubra Plena'.

'Rubro-sanguinea plena' (*Cydonia japonica rubro-sanguinea plena* Grignan, Rev. Hort. **1903:** 20. 1903) = 'Sanguinea Plena'.

'Russell's Red' (cult. at the Tudor House, Ripley, Engl., from Richmond Nurs., Windlesham, Engl.). Flowers bright scarlet-red, single. Selection of L. R. Russell, Windlesham, England, before 1961. Named for the Russell Nursery.

'Salicifolia' (*C. japonica salicifolia* Verschaffelt Nurs., Ghent, Belg., Cat. 1876–77, without description; Letellier Nurs., Caen, Fr., Cat. 1897, with description). With "willow-like leaves." Flower color and origin unknown, before 1876.

'Sanguinea flore pleno' (Van Geert Nurs., Anvers, Belg., Cat. 1893, without description; Sheridan Nurs., Clarkson, Can., Cat. 1941, with description) = 'Sanguinea Plena'.

'Sanguinea multiflora' (Carrière, Rev. Hort. **1886:** 182. 1886) = 'Sanguinea Plena Multiflora'.

'Sanguinea plena' (*Cydonia japonica sanguinea plena* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description; *ibid.*, Cat. no. 124. 1899, with description). Flowers rosy red, semidouble. Selection of Otto Froebel, before 1880.

'Sanguinea Plena Multiflora' (*Cydonia japonica sanguinea plena multiflora* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description). Flowers numerous, "blood-red," single. Selection of Otto Froebel, before 1880.

'Sanguinea Semiplena' (*C. japonica sanguinea semiplena* Späth Nurs., Berlin, Germ., Cat. 1910–11). Flowers scarlet-red, semidouble; fruits small, apple shaped, umbilicate. Origin unknown; Ludwig Späth says "Hort.," before 1905.

'Sarmentosa' (*C. japonica sarmentosa* Beissner *et al.*, Handb. Laubh.-Ben. 182. 1903, without description). Cultivated at the Forest Academy of Munich, Germany, since 1869. Probably a German cultivar. Flower color and origin unknown, before 1869.

'Scarlet' (*C. japonica* scarlet, Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1867) = 'Rubra'.

'Semi-alba-pleno' (*C. japonica semi-alba-pleno* Ellwanger & Barry Nurs., Rochester, N. Y., Cat. 1886) = 'Alba Semiplena'.

'Semi-plena' (*C. japonica semi-plena* Van Houtte Nurs., Ghent, Belg., Cat. 1869, without description; Simon-Louis Nurs., Metz, Fr., Cat. 1900–01, with description) = 'Rubra Semiplena'.

'Semipleno' (*C. japonica semipleno* Vollert Nurs., Lübeck, Germ., Cat. 1899–1900, without description) = 'Rubra Semiplena'.

'Serotina' (*C. japonica serotina* André, Rev. Hort. **1894:** 424. *f. 155, 156.* 1894). Flowers red, blooming in summer, arranged in corymbs, single; fruits borne on long peduncles. The shrub bearing these few flowers and fruits in the garden of Mr. Morel, horticulturist at Lyon-Vaise, France, in 1893 should not have been named as a new variety. Summer flowers disposed in corymbs, and fruits with long peduncles appear each year on most cultivars when heat and humidity are sufficient. This is a seasonal form rather than a cultivar.

'Shirataum' (Taranto Gard., Pallanza, It., List of Seeds 1956–57). Leaves narrow; flowers white, single. This cultivar came originally from K. Wada, Hakoneya Nurseries.

'Simirenkiana' (*C. japonica Simirenkiana* Simirenko, Rev. Hort. **1888:** 518. 1888). Leaves white; flowers pale red, single. L. Simirenko noted in his garden at Gorodistsche, Russia, for about 20 years, a branch of **Chaenomeles speciosa** (as *C. japonica*) abnormally deprived of chlorophyll. Wishing to propagate a shrub with completely white leaves, he grafted the branch on normal understock. Before waiting long enough for a failure, since a plant without chlorophyll can not synthesize food, Simirenko gave it his own name. This "variety" has not been heard of since.

'Simon' (Anonymous, Pl. Buyer's Guide, ed. 5. 59. 1949, without description) = 'Simonii'.

'Simonii' (*C. japonica Simonii* André, Rev. Hort. **1883:** 275. 1883). Flowers small, dark crimson-red, often with green marks, semidouble; fruits small, irregularly ovoid, ribbed, calyx accrescent. Due to its slow growth and semihorizontal habit, 'Simonii' has been recommended as a dwarf for rock gardens, and assigned to the Superba group. It reaches 5 feet in height and belongs to **C. speciosa** in spite of its small leaves. This cultivar was raised from seed of 'Atrosanguinea' before 1882, and named for the Simon-Louis Nursery, Metz, France, where it originated. This is not a synonym of 'Atrosanguinea', or of 'Rubra'. Similar to 'Atrosanguinea Plena'.

'Simoni rubra' (*C. japonica Simoni rubra* Letellier Nurs., Caen, Fr., Cat. 1909–10) = 'Simonii'.

'Simonis' (*C. japonica simonis* Van Geert Nurs., Anvers, Belg., Cat. 1893, without description) = 'Simonii'.

'Simplex alba' (*C. japonica simplex alba* Parsons Nurs., Flushing, N. Y., Descr. Cat. no. 38–39 [prob. 1887–89] = 'Alba Simplex'.

'Snow' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **12:** 12. 1945). Flowers large, white, single; fruits apple shaped, calyx accrescent. Selection no. DN–10 of W. B. Clarke, introduced 1945. The name is registered.

'Snow Queen' (Hillier Nurs., Winchester, Engl., Cat. 1942). Flowers white, single. Origin unknown, before 1942.

'Snow White' (*C. lagenaria* Snow White, Light Tree Nurs., Richland, Mich., Price List 1958, without description) = 'Snow'.

'Spitfire' (Anonymous, Am. Nurs. May 15, 1949). Shrubs with a columnar growth; flowers crimson-red, single; fruits apple shaped, ribbed, umbilicate. Selection of the Wayside Gardens, Mentor, Ohio, introduced 1949. Plant patent no. 830 taken on March 29, 1949.

'Splendens' (*C. japonica splendens* Van Geert Nurs., Anvers, Belg., Cat. 1893, without description). Flower color and origin unknown, before 1893.

'Starlight' (H. R. Kemmerer & J. C. McDaniel, Am. Nurs. May 1, **1961:** 10 & 53. *f.* 1961). Flowers white, sometimes reverting to pink or red, single. Selection no. 17 of Dr. A. Colby of the University of Illinois, introduced 1961.

'Striata' (*C. japonica striata* A. Leroy Nurs., Angers, Fr., Cat. 1873, without description). Flower color and origin unknown, before 1873.

'Sulphurea' (*C. japonica sulphurea* Desfossé-Thuillier Nurs., Orléans, Fr., Cat. 1874, without description; Goldring, Garden **40:** 127. 1891, with description) = 'Sulphurea Perfecta'.

'Sulphurea aurea' (Dickinson Nurs., Chatenay, Fr., Cat. 1904–05, without description) = 'Sulphurea Perfecta'.

'Sulphurea Perfecta' (*C. japonica sulphurea perfecta* Van Houtte Nurs., Ghent, Belg., Cat. 1867, without description; Lebas, Rev. Hort. **1868:** 320. 1868, with description). Flowers yellowish white, single. Probably selection of Louis van Houtte, before 1867.

'Taioh-Nishiki' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers cinnabar-red, single or double; fruits large, ovoid, umbilicate. Selection of K. Wada, Hakoneya Nurseries, before 1941. Taioh-Nishiki means emperor adorned with brocade.

'Tani-no-Yuki' (*Cydonia japonica* Tani-no-Yuki, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers bright red with a white base, single; fruits apple shaped, ribbed, umbilicate. Selection of K. Wada, Hakoneya Nurseries, before 1936. Tani-no-Yuki means snow in the valley.

'Taroyishi' (cult. at the Ida Cason Callaway Gard., Pine Mountains, Ga.) = 'Taioh-Nishiki'.

'Tatsugashira' (Ishii, Engei Shokubutsu Zufu 6, no. 1136, var. 11. 1930–34). Branches creeping on the ground, very spiny; leaves willow-like; flowers orange-red, single; fruits small, orange shaped. In Japanese gardens. Tatsugashira means dragon's head.

'Texas Pink' (Willis Nurs., Ottawa, Kans., Price List 1957–58). Flowers rose-pink, single; fruits orange shaped, umbilicate. Origin unknown, before 1957.

'Tortuosa' (*C. eugenioides* var. *tortuosa* Nakai, Bot. Mag. Tokyo **37:** 72. 1923) = 'Contorta'. The name 'Tortuosa', used by Nakai for a Japanese cultivar originally named 'Rinho', has been replaced by the widely used name of 'Contorta'. The name 'Tortuosa' is retained for another cultivar belonging to the Superba group.

'Toyo-Nishiki' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers white, white-and-pink, pink or red on the same branch, single; fruits large, apple shaped, umbilicate. Selection of K. Wada, Hakoneya Nurseries, before 1941. Toyo-Nishiki is the name of a Japanese wrestler.

'Toyonishiki' (E. L. Kammerer, Morton Arb. Bull. **29**(5): 20. 1954) = 'Toyo-Nishiki'.

*trichogyna* (*Chaenomeles trichogyna* Nakai, Bot. Mag. Tokyo **30:** 23. 1916) = **C. speciosa**. Nakai, Bot. Mag. Tokyo **32:** 146. 1918, says that "it is to be considered as the alternate name" of 'Cardinalis' which originated in European gardens while *C. trichogyna* was described from a specimen collected in Korea.

'Umbellata' (*C. lagenaria umbellata* Jackman Nurs., Woking, Engl., Cat. 1936–37) = 'Umbilicata'.

'Umbellicata' (*C. japonica umbellicata* Kelways Nurs., Langport, Engl., Cat. 1928) = 'Umbilicata'.

'Umbellicata rosea' (*C. japonica umbellicata rosea* Van Houtte Nurs., Ghent, Belg., Cat. 1867, without description) = 'Umbilicata'.

'Umbicillata' (*Cydonia japonica umbicillata* Prince Nurs., Flushing, N. Y., Cat. 1856) = 'Umbilicata'.

'Umbicillata rosea' (*C. japonica umbicillata rosea* Prince Nurs., Flushing, N. Y., Cat. 1860) = 'Umbilicata'.

'Umbilicata' (*Cydonia japonica* var. *umbilicata* Sieb. & De Vriese, Jaarb. Kon. Ned. Maatsch. **1848:** 17. *pl.* opp. 50. 1848). Flowers rosy red, single; fruits apple shaped, "umbilicate." Introduced by P. F. von Siebold from Japan, before 1847.

'Umbilicata macrocarpa' (*Cydonia japonica umbilicata macrocarpa* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53) = 'Macrocarpa'.

'Umbilicata Nana' (*Cydonia japonica umbilicata nana* Papeleu Nurs., Ledeberg, Belg., Cat. 1852–53). Shrubs dwarf, almost spineless; flowers orange-red, single. Selection of Moerloose, Ledeberg, Belgium, before 1852.

'Umbilisata' (Kluis & Koning Nurs., Boskoop, Neth., Cat. 1912, without description) = 'Umbilicata'.

'Umbilitica' (Kelways Nurs., Langport, Engl., Cat. 1940) = 'Umbilicata'.

'Unbilicata rosea' (Bunyard, The Planters' Handbook, 86, 1908) = 'Umbilicata'.

'Upright' (Adam Nurs., Westfield, Mass., Cat. 1957) = 'Rubra'.

'Upright Pink' (Burr Nurs., Manchester, Conn., Cat. 1958–59, without description). Flowers pink, single. Origin unknown, before 1958.

'Upright Red' (Burr Nurs., Manchester, Conn., Cat. 1958–59, without description) = 'Rubra'.

'Upright Spitfire' (Wayside Gard., Mentor, Ohio, Cat. 1950) = 'Spitfire'.

'Upright White' (Burr Nurs., Manchester, Conn., Cat. 1958–59, without description) = 'White Upright'.

'Van Aerschodti' (Van Geert Nurs., Anvers, Belg., Cat. 1893, without description). Flower color and origin unknown, before 1893.

'Variabilis tricolor' (A. Leroy Nurs., Angers, Fr., Cat. 1873, without description) = 'Variegata'.

'Variegata' (*Cydonia japonica variegata* Van Houtte Nurs., Ghent, Belg., Cat. 1869, wthout description). Flower color and origin unknown, before 1869.

'Variegatis' (*C. japonica variegatis* Beissner *et al.*, Handb. Laubh.-Ben. **1903:** 182. 1903, without description) = 'Foliis Variegatis'.

'Versicolor' (*C. japonica versicolor* Osborn Nurs., Fulham, Engl., Cat. 1870, without description; Späth Nurs., Berlin, Germ., Cat. 1887, with descrip-

tion). Flowers white and two shades of pink, single; fruits ovoid, umbilicate. Origin unknown, before 1870.

'Versicolor lutea' (*C. japonica versicolor lutea* Van der Bom Nurs., Oudenbosh, Neth., Cat. 1907, without description) = 'Versicolor Lutescens'.

'Versicolor Lutescens' (*C. japonica versicolor lutescens* A. Leroy Nurs., Angers, Fr., Cat. 1865, without description; *ibid.*, Cat. 1873, with description). Flowers salmon-pink suffused with orange-red, single; fruits irregularly obovoid, umbilicate. Origin unknown, before 1865.

'Versicolor Plena' (*Cydonia japonica versicolor plena* Anonymous [list of C. Baltet], Garden **13:** 144. 1878, without description; Carrière, Rev. Hort. **1886:** 182. 1886, with description). Flowers flesh- to rose-pink, semidouble. Probably a French cultivar, before 1878.

'Versicolor Semiplena' (*Cydonia japonica versicolor semiplena* Froebel Nurs., Zurich, Switz., Cat. no. 90. 1880, without description; *ibid.*, Cat. no. 124. 1899, with description). Flowers white-and-pink, semidouble. Selection of Otto Froebel, before 1880.

'White' (Strong Nurs., Brighton, Mass., Cat. 1874) = 'Candidissima'.

'White' (*C. lagenaria* white, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1937:** 12. 1937) = 'Nivalis'.

'White Upright' (Natorp Nurs., Cincinnati, Ohio, Cat. 1956, without description). Flowers white, single. Origin unknown, before 1956.

'Yellow' (*C. japonica* yellow, Hoyt Nurs., New Canaan, Conn., Cat. 1897) = 'Lutea'.

'Yuga' (name in an unpublished list of Dr. H. R. Kemmerer, Univ. of Ill.) = 'Yuyo'.

'Yuyo' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers terra cotta with cinnabar suffusion, single. Selection of K. Wada, Hakoneya Nurseries, before 1941. Yuyo means serenity.

**Chaenomeles × californica** Clarke, Garden Aristocrats **7:** 13. 1940. (*C. cathayensis × superba*). Californica group.

Shrubs usually 6 feet high. Branches stiff, erect as in *C. cathayensis*, but more numerous, strongly armed with spurs. Young shoots sparsely pubescent; those of the second year with a few warts. Leaves lanceolate, often showing a light fulvous tomentum on the under surface when young, the serration of the margins intermediate between that of the parents. Flowers large, usually pink or rosy red, or often showing a blend of the two. Fruits medium to large, ovoid, apple or orange shaped. Not hardy north of Zone VI, like one of its parents, **C. cathayensis.**[3]

[3] According to the International Code of Nomenclature for Cultivated Plants "a collective epithet in Latin form must be published with a Latin diagnosis and in combination with a generic name." We provide here the Latin diagnosis to complete Clarke's English description, and designate a lectotype chosen from among one of the four cultivars, 'Enchantress', 'Masterpiece', 'Rosemary', and 'Sunset Glow', first cited by Clarke in 1940, as included in his new group Californica.

Frutex, usque ad 6 pedalis altus. Rami erecti, rigidi, spinis validis ornati. Virgae leviter pubescentes, demum sparse verrucosae. Folia lanceolata, juvenilia saepe subtus leviter fulveo-tomentosa; serratura foliorum inter parentes. Flores magni, punicei vel roseo-rubri. Fructus ovoideus, pomoideus vel aurantiformis. LECTOTYPE: 'Rosemary', cult. under no. 2180–41 at the Univ. of Washington Arb., Seattle, Wash., coll. *J. A. Witt*, April 22, 1961 (Herb. Arnold Arb.).

The first cultivars of this group were initially selected in 1938 by the late Walter B. Clarke from the cross of **C. cathayensis** × **superba** 'Corallina' and were offered by him for sale in 1939, under "Cathayensis hybrids." Clarke changed the name in 1940 to **Chaenomeles californica.**

'ARTHUR COLBY' (H. R. Kemmerer & J. C. McDaniel, Am. Nurs. May 1, **1961:** 54. 1961). Flowers rosy red, single; fruits pomegranate shaped. Selection no. 9 of Dr. Arthur Colby of the University of Illinois; introduced 1961. Named for him by Messrs. Kemmerer and McDaniel. This is probably the product of a backcross of **C.** × **californica** to **C. speciosa.**

'Aurora' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1953) = 'DAWN'. The name 'Aurora' has already been applied to an older cultivar of **C. speciosa** which is still widely cultivated. We propose to call Clarke's 'Aurora' by the name of 'Dawn', the English translation of the word 'Aurora'.

'CALIFORNIA' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1948). Flowers pink and rose-pink, single; fruits orange shaped. Selection no. 327 of W. B. Clarke, introduced 1948. The name is registered.

'Californica' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **7:** 13. 1940). No. 327 = 'CALIFORNIA'. 'Californica' is the name of the hybrid group and does not apply to any cultivar in particular.

'CARDINAL' (Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1947). Flowers crimson-red, single. Selection of W. B. Clarke, probably no. DR-53, introduced 1947. This is a seedling of 'ROSEMARY'. The name is registered.

'Cardinal Red' (Anonymous, Pl. Buyer's Guide 93. 1958) = 'CARDINAL'.

'CLARKE'S GIANT RED' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1956). Branches straggling, low in habit for a member of the CALIFORNICA group, almost spineless; flowers very large, rosy red, single; fruits orange shaped, calyx accrescent. Selection of W. B. Clarke, introduced 1956. Named for the Clarke Nursery, San Jose, California. This is probably a tetraploid.

'Clarks' Giant' (Anonymous, Pl. Buyer's Guide 93. 1958) = 'CLARKE'S GIANT RED'.

'DAWN' (formerly 'Aurora', a name retained for another cultivar). Flowers soft pink and carmine-rose, single. Selection of W. B. Clarke, San Jose, California, probably no. E92–4, introduced in 1953 under the name 'Aurora'.

'DEEP RED' (Anonymous, Jaarb. Boskoop **1954:** 116. 1954, without description). Flowers "deep red," single; fruits large, apple shaped, umbilicate. Selection of W. B. Clarke, San Jose, California, sent to Kluis Nursery, Boskoop, Netherlands, around 1946.

'Deep Salmon' (Bonnell Nurs., Seattle, Wash., Cat. 1948) = 'Rosemary'.

'Enchantment' (Harrison, Handb. Trees & Shrubs South. Hem. 87. 1959) = 'Enchantress'.

'Enchantress' (*C.* × *californica* Enchantress, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **7:** 14. 1940). Flowers light and dark pink, single; fruits ovoid to pear shaped, umbilicate. Award of Merit of the Royal Horticultural Society on April 13, 1943. The name is registered.

'Fire' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **11:** 14. 1944). Flowers bright red, single; fruits ovoid. Selection no. 319 of W. B. Clarke, introduced 1944. Award of Merit of the California Horticultural Society. The name is registered.

'Flamingo' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **11:** 14. 1944). Flowers small, rose-pink, single; fruits ovoid, calyx slightly accrescent. Selection no. DR–51 of W. B. Clarke, introduced 1944. The name is registered.

'Masterpiece' (*C.* × *californica* Masterpiece, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **7:** 14. 1940). Flowers rose-pink, single; fruits large, ovoid. Selection no. 332 of W. B. Clarke, introduced 1940. The name is registered.

'Nasturtium' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951). Flowers large, "nasturtium" red, single. Selection of W. B. Clarke, probably no. L 70/30, introduced 1951. Award of Merit of the California Horticultural Society in 1950. The name is registered.

'Orange Red' (Bonnell Nurs., Seattle, Wash., Cat. 1948) = 'Sunset Glow'.

'Pink Beauty' (*C.* × *californica* Pink Beauty, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **8:** 15. 1941). Flowers light and dark pink, single; fruits orange shaped. Selection of W. B. Clarke, introduced 1941. The name is registered.

'Rosemary' (*C.* × *californica* Rosemary, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **7:** 14. 1940). Flowers pink to rose, single; fruits ovoid, calyx accrescent. Selection no. 310 of W. B. Clarke, introduced 1940. The name is registered.

'Rosy Morn' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951). Flowers soft pink, single; fruits apple shaped, umbilicate. Selection of W. B. Clarke, probably no. L 70/57, introduced 1951. The name is registered. This is probably the product of a backcross of **C.** × **californica** to **C.** × **superba.**

'San Jose' (Clarke Nurs., San Jose., Calif., Wholesale Price List Nov. 15, 1948). Flowers rosy red, single. Selection no. 317 of W. B. Clarke, introduced by G. R. Jackman, Woking, England, before 1948. Named for its place of origin. The name is registered.

'Sunset Glory' (Krüssmann, Deutsche Baumsch. **4**(4): 88. 1952) = 'Sunset Glow'.

'Sunset Glow' (*C.* × *californica* Sunset Glow, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **7:** 14. 1940). Flowers rose-pink to rosy red, single. Selection no. 314 of W. B. Clarke, introduced in 1940. The name is registered.

'Sunset Gold' (cult. at the Univ. of Wash., Seattle, Wash.) = 'Sunset Glow'.
'Sweet Glow' (Bonnell Nurs., Seattle, Wash., Cat. 1944) = 'Sunset Glow'.

**Chaenomeles** × **clarkiana** (new hybrid group).
(*C. cathayensis* × *japonica*). Clarkiana group.

Shrubs of low growth, maximum size unknown. Branches erect-spreading, covered with spines more numerous and longer than in **C. japonica**, more slender than in **C. cathayensis**. Young shoots pubescent; those of the second year slightly verruculose. Leaves and serration intermediate in shape and size between the two parents (small and narrow in 'Cynthia', large and broad in 'Minerva'). Flowers large, pink to rosy red. Fruits medium sized, apple to orange shaped. Not hardy north of Zone VI.

Frutex humilis, statura maxima ignota. Rami erecto-patentes, spinis elongatis, angustis, numerosis ornati. Virgae pubescentes, demum sparse verrucosae. Forma et serratura foliorum inter parentes. Flores magni, inter puniceum et roseo-rubrum. Fructus pomoideus vel aurantiformis. Holotype: 'Minerva', cult. under no. 239–59, at Royal Botanic Gardens, Kew, Richmond, Surrey, England, coll. *H. 1705/61*, May 9, 1961 (Herb. Arnold Arb.).

This hybrid group is named for the late Walter B. Clarke, nurseryman in California, who produced the hybrids. In 1945, he selected from this complex two cultivars, calling them "Miniature Cathayensis hybrids."

'Cynthia' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **14**: 10. 1947). Flowers pink and rosy red, single; fruits orange shaped, upper depression terminating in a narrow tip. Selection of W. B. Clarke, probably no. E.87–12, introduced in 1947. The name is registered.

'Minerva' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951). Flowers pink to rosy red, single; fruits apple shaped, irregularly ribbed. Selection of W. B. Clarke, probably no. E.87–10, introduced in 1951. The name is registered under no. 108 at the Association of American Nurserymen.

**Chaenomeles** × **superba** (Frahm) Rehder, Jour. Arnold Arb. **2**: 58. 1920.
*Cydonia maulei* var. *superba* Frahm, Gartenw. **2**: 214. 1898. (*C. japonica* × *speciosa*). Superba group.

Shrubs usually up to 4–5 feet high. Branches numerous, erect-spreading, with slender spines. Young shoots covered with short and scabrous tomentum; those of the second year verruculose. The amount of the tomentum is very variable, and when barely present may indicate a backcross to **C. speciosa.** Leaves intermediate in shape, size, and serration between the parents, but usually more like **C. japonica.** Flowers medium sized, white, pink, orange, or red. Fruits mostly apple shaped, larger than those of **C. japonica** and ripening at a somewhat later date.[4]

[4] *C.* × *superba* (Frahm) Rehder was validly published without a Latin diagnosis or indication of a type specimen, requirements which became mandatory from 1935 and 1958, respectively. To allow comparison to be made between the different hybrid groups, we provide the Latin diagnosis and designate a lectotype.

Frutex, normaliter usque ad 4–5 pedes altus. Rami numerosi, erectopatentes, spinis gracilibus ornati. Virgae scabroso-tomentosae, demum verrucosae. Forma foliorum inter parentes, sed fere ad *C. japonicam* vergens. Flores magni, albi, punicei, aurantiaci vel rubri. Fructus normaliter pomoideus. NEOTYPE: 'Superba', cult. under *no. 5108*, at the Arnold Arboretum, Jamaica Plain, Mass., coll. *A. R.*, May 3, 1921 (Herb. Arnold Arb.).

**C. × superba** was not originally recognized as a hybrid, but rather as a variety of **C. japonica** (as *Cydonia maulei*) and was described as such in 1898 by Frahm. Rehder regarded the cultivar 'SUPERBA' as the type of this hybrid group. According to the International Code of Nomenclature for Cultivated Plants, 'SUPERBA' also is to be regarded as the first cultivar in this complex, in spite of the fact that 'KNAP HILL SCARLET', another member of the SUPERBA group, originated seven years earlier.

'ABRICOT' (Lemoine Nurs., Nancy, Fr., Cat. 1908). Flowers orange, semi-double. Selection of Victor Lemoine, introduced 1908.

'Afterglow' (*C.* × *californica* Afterglow, Wyman, Am. Nurs. May 1, **1961:** 95. 1961) = **C.** × **superba**.

'ALBA' (*Cydonia japonica maulei alba* Froebel Nurs., Zurich, Switz., Cat. no. 124. 1899). Branches decumbent; flowers creamy white, single; fruits apple shaped or irregularly ovoid, calyx accrescent. Selection of Otto Froebel, introduced 1899.

'Alpina naranja' (*C. japonica alpina naranja* Clarke Nurs., San Jose, Calif., Gard. Aristocrats **6:** 12. 1939, without description; California Nurs., Niles, Calif., Cat. 1943, with description) = 'NARANJA'.

'Andenken an Carl Ramcke' (*C.* × *superba* Andenken an Carl Ramcke, Krüssmann, Handb. Laubh. **1:** 306. 1960) = ANDENKEN AN KARL RAMCKE'.

'Andenken an Ernest Finken' (cult. by Darthuizer Nurs., Boskoop, Neth.) = 'ERNST FINKEN'.

'ANDENKEN AN KARL RAMCKE' (Timm Nurs., Elmshorn, Germ., Cat. 1949–50). Flowers cinnabar-red, single. Cross made by Karl Ramcke in Hamburg, in 1924. Introduced by Timm Nursery, and named for the late Karl Ramcke, before 1949.

'Apricot' (*C. lagenaria* Apricot, Krüssmann, Laubh., 72. 1937). The French name 'Abricot' has been translated into German and English = 'ABRICOT'.

'Atrosanguinea' (*Cydonia japonica maulei atrosanguinea* Froebel Nurs., Zurich, Switz., Cat. no. 124. 1899) = 'OTTO FROEBEL'. The name 'Atrosanguinea' is preoccupied by that of an older cultivar of **C. speciosa,** still in cultivation. According to the International Code of Nomenclature for Cultivated Plants this later 'Atrosanguinea' must be renamed. We propose to call it 'Otto Froebel' for its originator.

'AZALEA' (Anonymous, Am. Nurs. Aug. 15, **1950:** 52. 1950). Flowers "azalea" pink, single. Selection no. DC–12 of W. B. Clarke, San Jose, California. Plant patent no. 940, taken on May 9, 1950. The name is registered.

'BENICHIDORI' (*Cydonia japonica* Benichidori, Hakoneya Nurs., Numazu-shi,

Jap., "Jap. Gard. Treasures" 1936). Flowers "crimson"-red, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Benichidori means crimson zig-zag.

'Boule de Feu' (Turbat Nurs., Orléans, Fr., Cat. 1916–17). Flowers salmon- to coral-pink, single; fruits small, irregularly apple shaped, narrowly umbilicate. This is the product of a cross made in the Barbier Nursery, Orléans, France, between 'Baltzii' and 'Maulei', before 1913.

'Boule de Fue' (Kingsville Nurs., Kingsville, Md., Cat. 1947) = 'Boule de Feu'.

'Bunyardii' (*Pyrus japonica Bunyardii* Bunyard, The Planters' Handbook 86. 1908). Flowers salmon-pink, single. Selection of George Bunyard, Maidstone, England, introduced in 1907. This is the product of a cross between 'Maulei' and 'Umbilicata' (as 'Rosea').

'Cameo' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1956). Branches almost spineless; flowers salmon- to coral-pink, double; fruits irregularly orange shaped, calyx accrescent. Selection of W. B. Clarke, introduced 1956.

'Charming' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951). Branches almost spineless; flowers pink to vermilion; fruits irregularly apple shaped. Selection of W. B. Clarke, probably no. DC–13, introduced in 1950.

'Chosan' (Krüssmann, Handb. Laubh. **1:** 306. 1960). This is a misspelling for 'Choshan' which is a synonym of 'Yaegaki'.

'Choshan' (Anonymous, Jour. Roy. Soc. **75:** lxxii. 1950) = 'Yaegaki'. An unnamed Japanese Quince imported from Japan by J. O. Sherrard, Newbury, England, was so appealing to him that he tried to find out its name through a Japanese nursery who thought it was 'Choshun' misspelled 'Choshan'. With its small apricot double flowers, it does not correspond to 'Choshun' which has large terra cotta-red, single flowers.

'Cole's Red' (*C. lagenaria* Cole's Red, Cole Nurs., Painesville, Ohio, Cat. 1941). Flowers bright scarlet-red, single; fruits apple shaped, umbilicate. Selection of D. B. Cole, introduced in 1941. Named for the Cole Nursery at Painesville, Ohio.

'Colette' (*C. japonica* Colette, Hemeray-Aubert Nurs., Orléans, Fr., Cat. 1955). Flowers salmon- to coral-pink, single. Selection of the Hemeray-Aubert Nurseries, introduced in 1950.

'Columbia' (Barbier Nurs., Orléans, Fr., Cat. 1896, with description of the fruits only; Späth Nurs., Berlin, Germ., Cat. 1904–05, with description of the flowers). Flowers pink to rosy red, single, often unisexual, mostly female; fruits less than 2 inches in diameter (Barbier says 8 to 10 *inches*; Turbat Nurs., Orléans, Fr., Cat. 1910–11 says 15 to 30 *inches* in circumference), irregularly apple shaped, umbilicate. Ludwig Späth says "American variety," which can not be the case in spite of its name. 'Columbia' appeared in American nursery catalogues about 40 years after it was common in European nurseries. Origin unknown, before 1896.

'Coquelicot' (Delaunay Nurs., Angers, Fr., Cat. 1958–59). Flowers orange, tinged with rose-pink, single. French cultivar of unknown origin, before 1958.

'Coral Beauty' (*C.* × *superba* Coral Beauty, Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1949). Branches almost spineless; flowers salmon- to coral-pink, single; fruits ovoid, calyx accrescent. Selection of W. B. Clarke, probably no. DC–16, introduced 1949. This is a seedling of 'Candida'. The name is registered.

'Coral Glow' (Leonard Nurs., Piqua, Ohio, Cat. 1934) = 'Corallina'.

'Corallina' (*C. japonica corallina* Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1934:** 15. 1934). Flowers orange, single; fruits small, apple shaped. Selected by W. B. Clarke in the seedlings resulting from a cross of **C. japonica** × **speciosa,** introduced 1934. This cultivar has been crossed with **C. cathayensis,** producing as a result most of the cultivars of the Californica group.

'Coral Sea' (*C.* × *superba* Coral Sea, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **10:** 15. 1943). Flowers salmon- to coral-pink, single; fruits orange shaped, upper depression terminating in a narrow tip. Selection of W. B. Clarke, probably no. DC–6, introduced 1943. This is a seedling of 'Candida'. The name is registered.

'Crimson and Gold' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **6:** 12. 1939). Shrubs dwarf and spreading; flowers dark crimson-red, single, early; fruits apple shaped, calyx accrescent. Selection of W. B. Clarke, probably no. 301, introduced 1939. 'Crimson and Gold' is the product of a cross between **C.** × **superba** 'Naranja' (as *C. japonica alpina* Naranja) and **C.** × **superba** 'Sanguinea' (as *C. lagenaria sanguinea*). It is named for the contrasting colors of the "crimson" petals with the "golden" stamens. The name is registered.

'Crimson and Red' (Cult. at the Landbouwhogeschool, Wageningen, Neth.) = 'Crimson and Gold'.

'Crimson Beauty' (Milton Nurs., Milton, Ore., Cat. 1943). Flowers bright "crimson," single or semidouble; fruits apple shaped, umbilicate. Selection of the Milton Nursery, around 1935.

'Crimson King' (Littlefield-Wyman Nurs., Abington, Mass., "Gard. Treasures" 1958) = 'Crimson Beauty'.

'Della Robbia' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **15:** 13. 1948). Branches almost spineless; flowers creamy white to pink, single. Selection no. DN–4 of W. B. Clarke, introduced in 1945. The name is registered.

'Double Orange' (Cult. at the Arnold Arb., Jamaica Plain, Mass., from Toichi Domoto Nurs., Hayward, Calif., since 1942) = 'Sunset'.

'Double Red' (Wyman, Am. Nurs. May 1, **1961:** 96. 1961). Flowers red, semidouble; fruits apple shaped, calyx accrescent. Selection of Toichi Domoto, before 1942.

'Double Vermilion' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1936:** 8.

1936). Shrubs, slow growing; flowers "vermilion," "semidouble"; fruits small, apple shaped, umbilicate. Origin unknown, before 1936.

'Dwarf Coral' (Anonymous, Jaarb. Boskoop **1954:** 116. 1954, without description). Flowers orange, single. Selection of W. B. Clarke, San Jose, California, sent to Kluis Nursery, Boskoop, Netherlands, around 1946.

'Early Apple Blossom' (*C.* × *superba* Early Apple Blossom, Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1940). Flowers soft and deep pink, single, female only; fruits irregularly apple shaped, calyx accrescent. Selection of W. B. Clarke, probably no. 343, introduced 1940. The name is registered.

'Early Orange' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **9:** 18. 1942). Flowers "orange," semidouble, "early." Selection no. 334 of W. B. Clarke, introduced 1942. The name is registered.

'Ecarlate' (Barbier Nurs., Orléans, Fr., Cat. 1913–14). Flowers "scarlet"-red, single. This is the product of a cross made in Barbier Nursery, between 'Baltzii' and 'Maulei', before 1913.

'Eclarate' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942, without description) = 'Ecarlate'.

'Elly Mossel' (*C. lagenaria* Elly Mossel, Ruys Nurs., Dedemsvaart, Neth., Cat. 1953–54). Flowers large, bright scarlet-red, flat open, single; fruits apple shaped, umbilicate. Selection of J. Mossel, Boskoop, Netherlands, introduced in 1950.

'Ernst Finken' (*C.* × *superba* Ernst Finken, Ruys Nurs., Boskoop, Neth., Cat. 1959–60). Flowers fiery red, single; fruits apple shaped, calyx persistent. Selection of H. Finken, Rodenkirchen bei Köln, Germany, introduced in 1952.

'Etna' (*C. lagenaria* Etna, Ruys Nurs., Dedemsvaart, Neth., Cat. 1953–54). Flowers scarlet-red, flat open, single; fruits apple shaped, umbilicate. Selection of K. Verboom, Boskoop, Netherlands, introduced in 1953. This is a seedling of 'Simonii' pollinated by an unknown **C.** × **superba**. As a result of the backcrossing of a member of the Superba group to **C. speciosa**, the leaves are more like those of **C. speciosa**.

'Extus Acumineus' (cult. at Royal Botanic Gardens, Kew, Richmond, Surrey, Engl.). Known to us from sterile shrubs only. Flower color and origin unknown, before 1959.

'Fascination' (Anonymous, Proefstation Boomkw., Boskoop List, 1958, without description). Flowers scarlet-red, single; fruits irregularly apple shaped, or ovoid, umbilicate, or calyx accrescent. Selection of J. Mossel, Boskoop, Netherlands, introduced 1954.

'Fire Dance' (*C. lagenaria* Fire Dance, Deutsche Baumsch. **5**(7): 188. 1953). Flowers red, single; fruits apple or pear shaped, umbilicate. Selection of K. Verboom, Boskoop, Netherlands; introduced in 1953. This is a seedling of 'Simonii' pollinated by an unknown **C.** × **superba**. It received a First Class Certificate in the Netherlands.

'Fire Dancer' (cult. at the Royal Botanic Gardens, Kew, Richmond, Surrey, Engl.) = 'Fire Dance'.

'Foliis Rubris' (*C. japonica foliis rubris* Späth Nurs., Berlin, Germ., Cat. 1887). Flowers sallow coral-pink, single; fruits ovoid, umbilicate. Origin unknown, probably selection of Ludwig Späth, before 1887. This cultivar was named 'Foliis rubris' because of the brown-reddish color of its young shoots and leaves. This character, found also in most of the other cultivars, disappears when the leaves mature.

'Fructico Alba' (Wister, Swarthmore Pl. Notes **1955:** 212. 1955, without description). Flowers white tinted with pink, single; fruits obovoid, calyx accrescent. Origin unknown, before 1942. The fruits which should be white, according to the cultivar name, are not paler than in many other cultivars.

'Fructo alba' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942, without description) = 'Fructico Alba'.

'Fructu alba' (Colby, Trans. Ill. Acad. Sci. **21:** 181. 1929) = 'Fructico Alba'.

'Fruitlandi' (Fruitland Nurs., Augusta, Ga., Cat. 1959–60). Flowers pink, single. Chance seedling selected by Fruitland Nurseries, introduced 1959. Named for its place of origin.

'George Landis' (cult. at the George Landis Arb., Esperance, N. Y.). Flowers sallow orange-red, single; fruits large, bright orange, apple shaped, umbilicate. This cultivar was brought by George Landis, for whom it is named, from a garden at Troy, New York, in 1946. This is a new cultivar previously undescribed and its name is registered.

'Glowing-Ember' (*C. lagenaria* Glowing-Ember, Willis Nurs., Ottawa, Kans., Cat. 1955). Flowers bright orange-red, single; fruits apple shaped, umbilicate. Selection of Willis Nursery, introduced in 1954 under the name 'Willis Strain', changed in 1955 to 'Glowing-Ember'.

'Grandiflora' (Kingsville Nurs., Kingsville, Md., Cat. 1947) = 'Grandiflora Rosea'.

'Grandiflora Perfecta' (*Cydonia maulei grandiflora perfecta* St. Olbrich, Gartenw. **4:** 270. 1900). Flowers cinnabar-red, single or slightly semidouble. Selection of Froebel Nursery, Zurich, Switzerland, introduced in 1900.

'Grandiflora perfecta' (*C. japonica grandiflora perfecta* Colby, Trans. Ill. Acad. Sci. **21:** 183. 1929) = 'Perfecta'.

'Grandiflora Rosea' (*Cydonia maulei grandiflora rosea* St. Olbrich, Gartenw. **4:** 270. 1900). Flowers creamy yellow to soft pink, single. Selection of Otto Froebel, Zurich, Switzerland, introduced in 1900.

'Grenade' (Lemoine Nurs., Nancy, Fr., Cat. 1908). Flowers red-orange, single to semidouble; fruits small, globular, umbilicate. Selection of Victor Lemoine, introduced in 1908.

'Harlequin' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1949). Flowers bicolored, Chinese coral inside, rose-pink outside, single. Selection of W. B. Clarke, probably no. E.92/6, introduced in 1949.

'Hever Castle' (*C. japonica* Hever Castle, Hillier Nurs., Winchester, Engl., Cat. 1959). Flowers shrimp-pink, single. Selected by a gardener of Hever Castle, home of the Astors, in Kent, England, and introduced by Hillier Nursery, before 1940. Named for its place of origin.

'High Noon' (H. R. Kemmerer & J. C. McDaniel, Am. Nurs. May 1, **1961:** 54. 1961). Flowers pink and rosy red, semidouble. Selection no. 5 of Dr. A. Colby of the University of Illinois, introduced 1961.

'Hi-no-Tsukasa' (*Cydonia japonica* Hi-no-Tsukasa, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers scarlet-red, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Hi-no-Tsukasa means scarlet umbrella.

'Hollandia' (*C. lagenaria* Hollandia, Krüssmann, Deutsche Baumsch. **5**(7): 188. 1953). Flowers scarlet-red, single; fruits apple shaped, umbilicate. Selection of K. Verboom, Boskoop, Netherlands, introduced in 1953. This is a seedling of 'Simonii' pollinated by an unknown **C.** × **superba**.

'Incende' (Kingsville Nurs., Kingsville, Md., Cat. 1947) = 'Incendie'.

'Incendie' (Lemoine Nurs., Nancy, Fr., Cat. 1913–14). Flowers scarlet-red, semidouble; fruits small, irregularly apple shaped, umbilicus large and pointed. Selection of Victor Lemoine, introduced in 1912. The name is registered.

'Incendie' (Wyman, Am. Nurs. May 1, **1961:** 97. 1961) = 'Knap Hill Scarlet'.

'Indian Chief' (Willis Nurs., Ottawa, Kans., Wholesale Price List 1957–58). Shrubs, very compact; flowers scarlet-red, single; fruits irregularly apple shaped, umbilicate. Selection of Willis Nursery, introduced in 1957.

'Jane Taudevin' (Anonymous, Jour. Roy. Hort. Soc. **82:** 19. 1957, without description). Flowers small, bright red, single. Selection of C. H. Taudevin, Raby Nurseries, Willaston-in-Wirral, England, before 1955.

'Jet Trail' (Phytotektor, Winchester, Tenn., Wholesale Price List 1961–62). Low growing shrubs; flowers pure white, flat open, single; fruits ovoid, calyx accrescent. Selection of Harvey M. Templeton, Phytotektor, introduced in 1961. This is a white sport of 'Texas Scarlet' which appeared in 1959. The name is registered.

'Juliet' (Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1940). Flowers salmon- to coral-pink, single; fruits ovoid, umbilicate. Selection no. 325 of W. B. Clarke, introduced in 1940. Named for the late Mrs. Juliet Scannavino who found it particularly "charming."

'Karl Ramke' (in an unpublished list of the Bailey Hortorium, from John Connon Nurs., Waterdown, Can.) = 'Andenken an Karl Ramcke'.

'Kinjishi' (cult. at the Morton Arb., Lisle, Ill., from Hakoneya Nurs., Numazu-shi, Jap., since 1939). Flowers red-orange, double. Selection of K. Wada, Hakoneya Nurseries, before 1939. Kinjishi means golden lion.

'Kinshi' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941) = 'Kinjishi'.

'Knap Hill' (Kingsville Nurs., Kingsville, Md., Cat. 1947) = 'Knap Hill Scarlet'.

'Knap Hill Scarlet' (*C. japonica* Knap Hill Scarlet, Goldring, Garden **40:** 127. 1891, without description; Becket, Garden **71:** 262. 1907, with description). Flowers large, red-orange, single; fruits small, strongly ribbed, umbilicate.

Selection of A. Waterer, Woking, England, before 1891. Named for Knap Hill Nursery.

'KNAP HILL SEEDLINGS' (*C. japonica* Knap Hill Seedlings, Knap Hill Nurs., Woking, Engl., Cat. 1937). Flowers in several shades of scarlet and pink. This is not a clone, but seedlings of 'KNAP HILL SCARLET' selected at the Knap Hill Nursery, before 1937.

'Knap Hill Variety' (Waterer's Nurs., Twyford, Engl., Cat. 1928–29) = 'KNAP HILL SCARLET'.

'LEICHTLINII' (*C. japonica Leichtlinii* Bean, Kew Hand List, ed. 3. 140. 1925, without description). Flowers bright red, single. Origin unknown. Probably named for Max Leichtlin, Baden-Baden, Germany, who presented a specimen of **Chaenomeles** × **superba** to the Royal Botanic Gardens, Kew, about 1890.

'MANDARIN' (Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1947). Flowers orange, single; fruits ovoid or obovoid, calyx accrescent. Selection no. DC–7 of W. B. Clarke, introduced in 1947. Named for the color, mandarin-red, of its flowers. The name is registered.

'MARGARET ADAMS' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1949). Flowers soft coral-pink, single; fruits apple shaped. Selection of W. B. Clarke, probably no. DC–24, introduced in 1949. The name is registered.

'MOMIJIYAMA' (*Cydonia japonica* Momijiyama, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers orange-scarlet, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Momijiyama means Maple Mountain.

'MOUNT SHASTA' (see 'Mt. Shasta'). Flowers large, white-and-pink tinted with lavender, single. Selected by W. B. Clarke in 1949, introduced in 1951. The name is registered.

'Mt. Shasta' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951) = 'MOUNT SHASTA'. According to a recommendation in the International Code of Nomenclature for Cultivated Plants, cultivar names should not begin with an abbreviation.

'NARANJA' (Clarke Nurs., San Jose, Calif., Gard. Aristocrats **1934:** 15. 1934). Flowers sallow orange tinged with rosy red, single; fruits ovoid, calyx accrescent. Origin unknown, before 1934.

'NICOLINE' (Anonymous, Jaarb. Boskoop **1954:** 116. 1954, without description; Grotendorst Nurs., Boskoop, Neth., Cat. 1960–61, with description). Flowers large, crimson-red, single to semidouble; fruits ovoid, slightly ribbed, umbilicate. Selection of Dr. S. G. A. Doorenbos, president of the International Dendrology Union, The Hague, Netherlands, introduced in 1956. This is a seedling of 'INCENDIE' pollinated by 'ROWALLANE' (as 'Rowallane Seedling') and according to Dr. Doorenbos, proves to be identical with 'ULIDIA'.

'NISHIKICHIDON' (*C. lagenaria* Nishikichidon, E. L. Kammerer, Bull. Morton Arb. **29**(5): 22. *pl.* 1954). Shrubs dwarf; flowers red-orange, semidouble; fruits ovoid, calyx accrescent. Selection of K. Wada, Hakoneya Nurseries,

Numazu-shi, Japan, introduced before 1939. Nishikichidon means dull brocade.

'Orange' (Lemoine Nurs., Nancy, Fr., Cat. 1908). Flowers red-"orange," semidouble. Selection of Victor Lemoine, introduced in 1908.

'Otto Froebel' (formerly 'Atrosanguinea', a name retained for another cultivar). Flowers blood-red, single. Selection of Otto Froebel, for whom it is named, introduced in 1899 under the name 'Atrosanguinea'. According to Froebel, it is not a synonym of 'Superba' from which it differs by brighter flowers.

'Perfecta' (*C.* × *superba* f. *perfecta* Rehder, Jour. Arnold Arb. **2:** 59. 1920) = 'Grandiflora Perfecta'.

'Perfecta' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1935). Flowers creamy white tinged with pink, lemon, and green, to rose-pink, single; fruits small, apple shaped, umbilicate. Origin unknown, but cultivated at the Arnold Arboretum, Jamaica Plain, Mass., since 1905. Obtained from Späth Nursery, Berlin, Germany. This is the shrub grown nearly everywhere under the name 'Perfecta', in spite of the fact that Rehder's 'Perfecta' has red, single to semidouble flowers. We propose to keep the name 'Perfecta' for this cultivar with white-and-pink flowers and to call the red one 'Grandiflora Perfecta' as it was originally named.

'Pink Lady' (Clarke Nurs., San Jose, Calif., Wholesale Price List Nov. 15, 1946). Flowers pink to rose, single; fruits apple shaped, umbilicate. Selection of W. B. Clarke, probably no. DC–11, introduced in 1946. The name is registered.

'Pink Princess' (Corliss Nurs., Gloucester, Mass., Cat. 1957) = 'Pink Lady'.

'Porcelain Rose' (cult. at the U.S. Plant Introd. Station, Glenn Dale, Md.). Flowers small, white-and-pink with a lemon touch, semidouble; fruits apple shaped, umbilicate. Origin Glenn Dale, Maryland, before 1960. This is a new cultivar previously undescribed.

'Rakuyo' (*Cydonia japonica* Rakuyo, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers vermilion-orange, double. Selection of K. Wada, Hakoneya Nurseries, before 1936. Rakuyo means fall of leaves.

'Red Chief' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1953). Flowers rosy red, double; fruits apple shaped, umbilicate. Selection of W. B. Clarke, introduced in 1953.

'Red Flowers' (Wyman, Am. Nurs. May 1, **1961:** 95. 1961) = 'Vermilion'.

'Renny Mossel' (name from Dr. I. C. Dorsman, director Proefstation Boomkwerij, Boskoop, Neth.) = 'Fascination'.

'Rosea' (*C.* × *superba* f. *rosea* Rehder, Jour. Arnold Arb. **2:** 59. 1920) = 'Grandiflora Rosea'.

'Rosea grandiflora' (cult. at the Holden Arb., Mentor, Ohio) = 'Grandiflora Rosea'.

'Rowallana' (Wister, Swarthmore Pl. Notes, **1942:** 127. 1942) = 'Rowallane'.

'Rowallane' (Anonymous, Jour. Roy. Hort. Soc. **83:** 481. 1958). Flowers large, bright red, single; fruits apple shaped or ovoid, dry calyx persisting. Chance seedling selected by H. Armytage Moore, at Rowallane, Northern Ireland, about 1920. Named for its place of origin.

'Rowallane Seedling' (*C. japonica* Rowallane Seedling, Hillier Nurs., Winchester, Engl., Cat. 1947–48) = 'Rowallane'.

'Rowallane Variety' (*C. lagenaria* Rowallane Variety, Slinger, Jour. Roy. Hort. Soc. **81:** 476. 1956) = 'Rowallane'.

'Rowalling Seedling' (Donard Nurs., Newcastle, N. Ireland, "Good Gard. Pl." 1960–61) = 'Rowallane'.

'Roxana Foster' (Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951). Flowers red-crange, single. Selection of W. B. Clarke, probably no. DN–95, introduced by the Thomas Bell Foster Nurseries, Houston, Texas, in 1951. Named for Mrs. Roxana Foster, mother of Thomas B. Foster. The name is registered.

'Rubrifolia' (Späth Nurs., Berlin, Germ., Cat. 1910–11) = 'Foliis Rubris'.

'Ruby Glow' (*C.* × *superba* Ruby Glow, Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1947). Flowers red, single; fruits large, ovoid, calyx accrescent. Selection of W. B. Clarke, probably no. E.88–15, introduced in 1947. This must be a backcross of **C.** × **superba** to **C. speciosa**. The name is registered.

'Salmon' (Sunningdale Nurs., Windlesham, Engl., Cat. 1936). Flowers salmon-red, single. Origin unknown, before 1936.

'Sämmlinge von Andenken an Karl Ramcke' (Timm Nurs., Elmshorn, Germ., Cat. 1955–56). Flowers cinnabar-red, single. The name indicates that it is a seedling of 'Andenken an Karl Ramcke'. Selection of Timm Nurseries, before 1955.

'Sanguinea' (*C. japonica sanguinea* Beissner *et al.*, Handb. Laubh.-Ben. 182. 1903, without description; Bobbink & Atkins Nurs., East Rutherford, N. J., Cat. 1934, with description). Flowers dark red, single. Origin unknown, before 1903.

'Scarlet' (*C. maulei* scarlet, Kingsville Nurs., Kingsville, Md., Cat. 1947). Flowers rosy red, single. Origin unknown, before 1947.

'Scarlet and Gold' (Sunningdale Nurs., Windlesham, Engl., Cat. 1961) = 'Crimson and Gold'.

'Semperflorens' (Hesse Nurs., Weener-Ems, Germ., Cat. 1908–09, without description; Turbat Nurs., Orléans, Fr., Cat. 1910–11, with description) = 'Columbia'. This cultivar was said by Hermann Hesse, in whose nursery it was selected in 1901, to be blooming a second time during the year, hence its name. It is in no way different from 'Columbia'.

'Sensational New Red' (Cole Nurs., Painesville, Ohio, Cat. 1942) = 'Cole's Red'.

'Shell Pink' (cult. at the Monrovia Nurs., Azusa, Calif.) = 'Charming'.

'Shinonome' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941).

Flowers salmon-pink with a red suffusion, single; fruits large, orange shaped, umbilicate. Selection of K. Wada, Hakoneya Nurseries, before 1939. Shinonome means girl of Shino, a town usually spelled Shinjō, in Japan.

'Shirabotan' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers pure white, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Shirabotan means white button.

'Shirabotau' (Taranto Gard., Pallanza, It., List of Seeds 1956–57) = 'Shirabotan'.

'Shirobotan' (*Cydonia japonica* Shirobotan, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936), corrected in 1941 to 'Shirabotan'.

'Spring Fashion' (H. R. Kemmerer & J. C. McDaniel, Am. Nurs. May 1, **1961:** 54. 1961). Flowers white and rose-pink with a lemon touch, single. Selection no. 10 of Dr. A. Colby of the University of Illinois, introduced in 1961.

'Stanford Red' (*C.* × *superba* Stanford Red, Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1940). Flowers tomato-red, flat open, single; fruits small, ovoid. Selection no. 340 of W. B. Clarke, introduced in 1940. The name is registered. Award of Merit of the California Horticultural Society, in 1945.

'Sunrise' (Gauntlet Nurs., Chiddingfold, Engl., Cat. 1930) = 'Knap Hill Scarlet'.

'Sunset' (Anonymous, Am. Nurs. Aug. 1, **1946:** 41. 1946). Flowers red-orange, often unisexual, semidouble; fruits apple shaped, calyx persisting. Selection of Toichi Domoto, Hayward, California, before 1942. Plant patent no. 700, taken on June 25, 1946.

'Superba' (*C. maulei* var. *superba* Frahm, Gartenw. **2:** 214. 1898). Flowers scarlet-red, single or slightly semidouble; fruits apple shaped, deeply umbilicate. Origin unknown, probably a German cultivar, before 1898.

'Texas Scarlet' (*C.* × *superba* Texas Scarlet, Clarke Nurs., San Jose, Calif., Wholesale Price List May 1, 1951). Branches spreading, almost spineless; flowers large, watermelon-red, flat open, single; fruits apple shaped, calyx persisting. Selection of W. B. Clarke, probably no. DC–125, introduced and named by Thomas Bell Foster Nurseries, Houston, Texas, before 1951. The name is registered.

'Thornless Pink' (Stribbling Nurs., Merced, Calif., Wholesale Price List 1958, without description) = 'Pink Lady'.

'Tortuosa' (*C. maulei* var. *tortuosa* Nakai, Jap. Jour. Bot. **4:** 329. 1929). Branches and spines tortuous. Flower color and origin unknown, before 1929.

'Ulidia' (*C. maulei* Ulidia, Donard Nurs., Newcastle, N. Ireland, "Good Gard. Pl." 1960–61). Flowers large, crimson-red, single; fruits ovoid, strongly ribbed. Selection of Slieve Donard Nursery about 1945, introduced about 1955. This is a seedling of 'Rowallane' and according to Dr. S. G. A. Doorenbos, The Hague, Netherlands, is identical with his 'Nicoline'.

'Verboom's Vermilion' (Krüssmann, Deutsche Baumsch. **5**(7): 188. 1953) = 'Etna'.

'Vermilion' (Barbier Nurs., Orléans, Fr., Cat. 1913–14). Flowers orange, single; fruits apple shaped, umbilicate. Selection of Barbier Nurseries, introduced in 1913. This is the product of a cross between 'Baltzii' and 'Maulei'.

'Vermilion Double' (Kingsville Nurs., Kingsville, Md., Cat. 1947) = 'Double Vermilion'.

'Vesuvius' (cult at the Royal Botanic Gardens, Kew, Richmond, Surrey, Engl.). Flowers large, scarlet-red, single; fruits apple shaped, narrowly umbilicate. Selection of K. Verboom, Boskoop, introduced in 1953. This is a seedling of 'Simonii' pollinated by an unknown **C. × superba**. The leaves of this backcross look more like those of **C. speciosa**.

'Wakaba' (*Cydonia japonica* Wakaba, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers terra cotta-red, semidouble. Selection of K. Wada, Hakoneya Nurseries, before 1936. Wakaba means verdant leaves.

'White Fruit' (cult. at the Morton Arb., Lisle, Ill.; plant now dead) = 'Fructico Alba'.

'Willis Strain' (Willis Nurs., Ottawa, Kans., Cat. 1953–54) = 'Glowing-Ember'.

'Winter Cheer' (*C. lagenaria* Winter Cheer, Lord, Shrubs & Trees Austr. Gard. 258. 1948). Shrub blooming especially in mid-winter; flowers orange-scarlet, single. Australian cultivar of unknown origin, before 1948.

'Yaegaki' (*Cydonia japonica* Yaegaki, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers orange-apricot, semidouble. Selection of K. Wada, Hakoneya Nurseries, before 1936. Yaegaki means double fence.

**Chaenomeles × vilmoriniana** (new hybrid group).

(*C. cathayensis* × *speciosa*). Vilmoriniana group.

Shrubs about 7–8 feet high. Branches stiff, erect as in *C. cathayensis*, but more numerous, armed with spurs or strong spines. Young shoots glabrous or sparsely pubescent; those of the second year completely smooth. Leaves elliptic to ovate, when young with a light fulvous tomentum on the under surface, sharply serrate, with the serration usually terminating in an awn-like tip. Flowers large, white, suffused with pink as in *C. cathayensis*. Fruits few, ovoid, approximately 8 cm. long, ripening late.

Frutex, usque ad 7–8 pedes altus. Rami erecti, numerosi, spinis validis ornati. Virgae glabrae vel leviter pubescentes, demum omnino leves. Folia elliptica vel ovata, acute serrata, juvenilia subtus leviter fulvo-tomentosa; apex serraturae acriformis. Flores magni, albi, puniceo suffusi. Fructus ovoideus. Holotype: 'Afterglow', cult. at National Arboretum, Washington, D. C., coll. *R. M. Jefferson*, April 24, 1962 (Herb. Arnold Arb.).

Not hardy north of Zone VI. This hybrid group is named for the late Philippe de Vilmorin, Verrières-le-Buisson, France, who, in 1921, made the cross from which the first cultivar of this group was raised.

'Afterglow' (Clarke Nurs., San Jose, Calif., Wholesale Price List Dec. 1, 1947). Leaves long and narrow; flowers white turning rose-pink with a touch of lavender, semidouble; fruits ovoid, slightly ribbed, calyx accrescent. Selection of W. B. Clarke, probably no. E.90–2, introduced in 1947. Clarke says that "it is a seedling of 'Mount Everest' which it resembles in most ways except that it has double flowers." Plant Patent no. 847 taken on June 14, 1949. The name is registered.

'Hybrida' (*C. hybrida* [*C. cathayensis* × *speciosa*, as *C. lagenaria cathayensis* × *japonica*] Lemoine Nurs., Nancy, Fr., Cat. no. 202. 1928, without description) = 'Vedrariensis'.

'Mount Everest' (*C.* × *californica* Mount Everest, Clarke Nurs., San Jose, Calif., Gard. Aristocrats **7:** 14. 1940). Leaves long and narrow; flowers large, white turning rose-pink with a touch of lemon and lavender, single; fruits ovoid, calyx accrescent. Selection no. 355 of W. B. Clarke, introduced in 1940. The name is registered.

'Mt. Everest' (Krüssmann, Deutsche Baumsch. **4**(4): 88. 1952) = 'Mount Everest'.

'Vedrariensis' (*C. hybrida vedrariensis* Lemoine Nurs., Nancy, Fr., Cat. no. 204. 1930, without description). Leaves short and broad; flowers white tinted with pink, single; fruits obovoid. Cross made by Philippe de Vilmorin, Verrières-le-Buisson, France, in 1921, by pollinating **C. cathayensis** with pollen of **C. speciosa** (as *C. japonica*). Introduced by Victor Lemoine, 1929.

### Cultivars of Undetermined Species or Hybrid Group

'Akebono' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers pale pink with stripes of a deeper color, single. Selection of K. Wada, Hakoneya Nurseries, before 1941. Akebono means dawn.

'Albo-lineata' (*C. japonica albo-lineata* Morel, Rev. Hort. **1909:** 277. 1909). Branches decumbent; flowers rose-pink bordered with white, single. Origin unknown, before 1909.

'Argentea' (*C. japonica argentea* Buyssens Nurs., Uccle, Belg., Cat. 1933, without description). Origin unknown, before 1933.

'Atrocaulis' (*C. japonica atrocaulis* Waterer's Nurs., Twyford, Engl., Cat. 1930). Flowers bright crimson-scarlet-red, single. Origin unknown, before 1930.

'Benibotan' (*Cydonia japonica* Benibotan, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers bright red, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Benibotan means crimson button.

'Carmine Queen' (Sunningdale Nurs., Windlesham, Engl., Cat. 1936). Flowers "carmine," single. Origin unknown, before 1936.

'Choshun' (*Cydonia japonica* Choshun, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers terra cotta-red, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Choshun means enlistment.

'Clayden' (Anonymous, Jour. Roy. Hort. Soc. **72:** lxx. 1947, without descrip-

tion). Flower color and origin unknown, before 1947. Exhibited by Miss E. Clayden, Parkstone, England.

'Coral Red' (Sunningdale Nurs., Windlesham, Engl., Cat. 1936, without description). Flowers "coral-red," single. Origin unknown, before 1936.

'Crippsi' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942, without description). Flower color and origin unknown, before 1942.

'Dixie Scarlet' (Hastings Seeds, Atlanta, Ga., Cat. 1962). Flowers "scarlet"-red, single. Selection of Harvey M. Templeton, Phytotektor, Winchester, Tennessee, introduced by Hastings Seeds, 1962.

'Dwarf Orange Red' (W. Allan Nurs., Summerville, S. C., Cat. 1960, without description). Flowers "orange-red," single. This may not be a clone, but selected seedlings only. Since Walter Allan is now dead, and his nursery sold, the origin of his selections will remain unknown.

'Dwarf Scarlet' (W. Allan Nurs., Summerville, S. C., Cat. 1960, without description). Flowers "scarlet"-red, single. See 'Dwarf Orange Red'.

'Hakugyoku' (*Cydonia japonica* Hakugyoku, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers pure white, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Hakugyoku means white jewel.

'Hibotan' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers large, scarlet-red, single. Selection of K. Wada, Hakoneya Nurseries, before 1941. Hibotan means scarlet button.

'Kimpo' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers pale yellow, double. Selection of K. Wada, Hakoneya Nurseries, before 1941. Kimpo means golden waves.

'Kogyoku' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers large, vermilion-red, single. Selection of K. Wada, Hakoneya Nurseries, before 1941. Kogyoku means ruby.

'Koshi-no-Homare' (*Cydonia japonica* Koshi-no-Homare, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers vermilion-red, double. Selection of K. Wada, Hakoneya Nurseries, before 1936. Koshi-no-Homare means honor in the reign of the prince.

'Koshi-no-Yuki' (*Cydonia japonica* 'Koshi-no-Yuki, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers large, white, single or semidouble. Selection of K. Wada, Hakoneya Nurseries, before 1936. Koshi-no-Yuki means snow pioneer.

'Lewalliensis' (cult. at the Nat. Arb., Washington, D. C.). Flower color and origin unknown, before 1960. This name was probably derived from a confusion with *Chaenomeles japonica* var. *maulei* Lawallée, Arb. Segrez. 110. 1877.

'Natorp's Hybrid' (*C. lagenaria* Natorp's Hybrid, Natorp Nurs., Cincinnati, Ohio, Cat. 1956). Flowers light red, single. Selection of Natorp Nursery, before 1956.

'Pink Perfection' (Harrison, Handb. Trees & Shrubs South. Hem. 87. 1959). Branches erect, flowers clear pink, single. Origin unknown, before 1959.

'Port Eliot' (cult. at the Tudor House, Ripley, Engl., from Cornwall). Flowers tangerine-orange, single. Origin unknown, before 1962.

'Purity' (Anonymous, Am. Nurs. Aug. 1, **1946:** 41. 1946). Branches erect; flowers pure white, double. Selection of Toichi Domoto, Hayward, California, before 1946. Plant Patent no. 701, taken on June 25, 1946, under the name of 'Shasta', changed to 'Purity'.

'Riccartonii' (Harrison, Handb. Trees & Shrubs South. Hem. 87. 1959). Flowers deep red, single. New Zealand cultivar, the original shrub still to be seen at Deans Bush, Riccarton, N. Z. Named for its place of origin, before 1959.

'Rosy Red' (Anonymous, Jaarb. Boskoop **1954:** 116. 1954, without description). Flowers rosy red, single. Selection of W. B. Clarke, probably no. 326, sent to Kluis Nursery, Boskoop, Netherlands, about 1946.

'Salmonea' (Bruno, Rev. Hort. **1890:** 212. 1890, without description; Hodgins Nurs., Essendon, Australia, Cat. without date, probably 1925, with description). Flowers clear salmon to rose-pink, single. Origin unknown, before 1890.

'Salmon Queen' (Sunningdale Nurs., Windlesham, Engl., Cat. 1961) = 'Rosy Red'.

'Shasta' (Plant Patent no. 701, taken by Toichi Domoto, nurseryman, Hayward, Calif., June 25, 1946), name changed to 'Purity'.

'Shokko' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers large, crimson-red, double. Selection of K. Wada, Hakoneya Nurseries, before 1941. Shokko means candle light.

'Single White' (W. Allan Nurs., Summerville, S. C., Cat. 1953–54, without description). Flowers white, single. See 'Dwarf Orange Red'.

'Sinica' (Bean, Trees & Shrubs **1:** 453. 1914). Flowers deep red, double. Origin unknown, before 1914.

'Snowbird' (Weston Nurs., Hopkinton, Mass., Cat. 1958). Flowers white, single. Origin unknown, before 1958.

'Tall Large Flowering Salmon' (W. Allan Nurs., Summerville, S. C., Cat. 1960, without description). Flowers salmon, single. See 'Dwarf Orange Red.'

'Tattagawa' (*Cydonia japonica* Tattagawa, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers deep brownish pink shaded yellow toward the base, single. Selection of K. Wada, Hakoneya Nurseries, before 1936. Tattagawa is the name of a Japanese river.

'Temmei' (*Cydonia japonica* Temmei, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers crimson-red, double. Selection of K. Wada, Hakoneya Nurseries, before 1936. Temmei is the name of a district in Japan, which means destiny.

'Terra Cotta' (Wister, Swarthmore Pl. Notes **1942:** 128. 1942, without description). Flower color and origin unknown, before 1942.

'Thornless Crimson' (cult. at the U.S. Plant Introd. Station, Glenn Dale, Md., now dead). Branches spineless; flowers crimson-red, single. Selection of Glenn Dale, before 1960.

'Tsukasa-Botan' (Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1941). Flowers yellowish salmon, double. Selection of K. Wada, Hakoneya Nurseries, before 1941. Tsukasa-Botan means king's button.

'Tsukasi' (cult. at the Univ. of Minnesota, St. Paul, Minn.) = 'Tsukasa-Botan'.

'Umbato' (*Cydonia umbato* Roemer, Fam. Nat. Reg. Veg. Syn. Mon. **3:** 218. 1847). Flowers red, single; fruits apple shaped. Origin unknown, before 1947. In Japanese and Chinese gardens.

'Winter Flowering' (Duncan & Davies Nurs., New Plymouth, N. Z., Cat. 1926). Flowers bright red, single. Selection of Duncan & Davies Nursery, introduced in 1926.

'Woking Star' (cult. at the Tudor House, Ripley, Engl.). Flowers pink, single. Origin unknown, before 1962.

'Yokuku' (Harrison, Handb. Trees & Shrubs South Hem. 87. 1959). Flowers pure white, single. Japanese cultivar of unknown origin, before 1959. "Yokuku" may be a misspelling for "Yokkyu" which means desire.

'Zabelii' (Univ. V. Babes, Din Cluj, Romania, Seed List 1960, without description). Flower color and origin unknown, before 1960. Named for Hermann Zabel, Superintendent of the Forest Academy of Munich, Germany.

'Zansetsu' (*Cydonia japonica* Zansetsu, Hakoneya Nurs., Numazu-shi, Jap., "Jap. Gard. Treasures" 1936). Flowers creamy white, single to double. Selection of K. Wada, Hakoneya Nurseries, before 1936. Zansetsu means lingering snow.

## III. CULTIVARS LISTED ACCORDING TO COLOR CLASS

To guide the horticulturist or the amateur gardener who may find the list of over 550 names formidable, this third list is added. This is an attempt to classify the living cultivars by color according to the Nickerson color fan distributed by the American Horticultural Council. It was possible to compare drawings of flowers of a single shrub with other drawings made at different dates. The conclusion from these studies is that the colors may change in intensity from year to year, or season to season. In this list the predominating color, or the range of color, is given. Within each of the five color classes the cultivars are further classified by color characteristics and then arranged according to their predominant single, semidouble, or double flower character which also may vary somewhat according to the season. A double dagger (‡) preceding the name indicates that the plant has been found outstanding in regard to flowers and vegetative characters, and may be recommended for cultivation. This evaluation was based on observations made in arboreta in the eastern and midwestern United States and in several European botanical gardens.[5] It should be noted

[5] Since the Arnold Arboretum is gathering as complete as possible a living collection of *Chaenomeles*, it will be possible in the future to rate accurately many cultivars which are now being "tested."

that cultivars and hybrids of *Chaenomeles cathayensis* are not hardy north of Zone VI.

## Class I. **White**

Flowers pure white, single.

'Angustifolia'
‡ 'Candida'
'Eburnea'
'Euphrosyne'
'Hakugyoku'
'Jet Trail'
'Nivalis'
'Nivea'
'Shirabotan'
'Shirataum'
'Single White'
‡ 'Snow'
'Snowbird'
'Snow Queen'
'Starlight'
'White Upright'
'Yokuku'

Flowers pure white, semidouble.

'Koshi-no-Yuki'
'Purity'

Flowers creamy white or yellowish, single.

'Alba'
'Mallarot'
'Sulphurea Perfecta'
'Zōge'

Flowers creamy white or yellowish, semidouble.

'Zansetsu'

Flowers creamy white or yellowish, double.

'Kimpo'

## Class II. **White-and-Pink**

The proportion of white and pink varies in individual flowers depending on the amount of light and heat they receive at anthesis, and on their maturity. Occasional flowers of the cultivars listed below are pure white or completely pink.

Flowers white-and-pink without yellow, single.

'Alba Cincta', white, bordered deep pink 10RP 6/12.

'Alba Floribunda', white and deep pink 2.5R 6/11.

'Alba Rosea', white, outer side rose-pink.

'Carnea', white, outer side pale pink.

'Contorta', white tinted with strong pink 2.5R 7/8.

'Fructico Alba', white tinted with moderate pink 2.5R 8/5.

‡ 'Jimmy's Choice', white and moderate yellowish pink 7.5R 8/6 to strong purplish red 7.5RP 5/12.

'Kan-Toyo-Nishiki', white and moderate pink 2.5R 8/5 to strong purplish pink 7.5RP 7/10.

'Mallardii', deep pink in the center with white edges.

‡ 'Marmorata', white and strong pink 2.5R 7/8.

‡ 'Moerloosei', white and deep pink 2.5R 6/11.

‡ 'Mount Shasta', white and pale pink 2.5R 9/3, tinted with lavender.

'Nivea Extus Coccinea', white, outer side pink.

‡ 'Toyo-Nishiki', white and moderate pink 2.5R 8/5 to strong purplish pink 7.5RP 7/10.

'Vedrariensis', white tinted with pink.

'Versicolor', white and moderate pink 2.5R 8/5 to deep purplish pink 7.5RP 6/12.

FLOWERS WHITE-AND-PINK WITHOUT YELLOW, SEMIDOUBLE.

'Afterglow', white tinted with pink, turning soft rose.

'Alba Grandiflora Plena', white and pale pink 2.5R 9/3.

‡ 'Alba Semiplena', white to deep pink 2.5R 6/11.

FLOWERS WHITE-AND-PINK WITH A LEMON TOUCH, SINGLE.

'Apple Blossom', white and deep pink 2.5R 6/11.

'Candicans', "pinkish tinged creamy yellow."

'Candidissima', white and pale pink 2.5R 9/3.

'Della Robbia', creamy white turning pink.

'Dorothy Rowe', white and moderate pink 10RP 8/5.

'Grandiflora', white to strong pink 2.5R 7/8.

'Grandiflora Rosea', "creamy yellow to soft pink."

'Lutea Viridis', white and greenish yellow turning moderate pink 2.5R 8/5.

‡ 'Mount Everest', white tinted with pale pink 2.5R 9/3, lemon and lavender.

'Papeleui', creamy white and pink.

'Perfecta', creamy white to deep pink 10RP 6/12.

'Rosea Grandiflora', white to moderate pink 2.5R 8/5.

'Spring Fashion', white turning deep pink 10RP 6/12.

FLOWERS WHITE-AND-PINK WITH A LEMON TOUCH, SEMIDOUBLE.

'Porcelain Rose', white and moderate pink 10RP 8/5 to deep pink 10RP 6/12.

## CLASS III. **Pink**

FLOWERS PINK TO ROSE, SINGLE.

'Akebono', "pale pink with stripes of a deeper color."

'Bonfire', strong pink 2.5R 7/8 to strong red 2.5R 5/12.

'California', deep pink 2.5R 6/11.

'Carmine Queen', "carmine."

'Columbia', moderate pink 2.5R 8/5 to deep pink 2.5R 6/11.

'Cynthia', moderate pink 5R 8/6 and deep pink 2.5R 6/11.

'Dawn', "soft pink and carmine-rose."
'Deep Pink', deep pink 2.5R 6/11.
'Early Apple Blossom', strong pink 2.5R 7/8.
‡ 'Echo', moderate pink 5R 8/6 and deep pink 2.5R 6/11.
‡ 'Enchantress', strong pink 2.5R 7/8 to deep pink 2.5R 6/11.
'Flamingo', deep pink 10RP 6/12 to strong purplish red 10RP 5/12.
'Fruitlandi', moderate pink 5R 8/6 and deep pink 2.5R 6/11.
'Gaujardii', strong pink 2.5R 7/8.
'Japanese Scarlet', strong pink 2.5R 7/8 and strong red 2.5R 5/12.
'Masterpiece', deep pink 2.5R 6/11.
'Minerva', strong pink 2.5R 7/8.
'Pacific Red', pink to red.
‡ 'Pink Beauty', deep pink 2.5R 6/11.
'Pink Lady', strong purplish pink 7.5RP 7/10 to strong red 2.5R 5/12.
'Pink Perfection', "clear pink."
‡ 'Rosemary', deep pink 2.5R 7/8.
‡ 'Rosy Morn', moderate pink 2.5R 8/5.
'Sunset Glow', moderate pink 5R 8/6 and strong purplish red 10RP 5/12.
'Texas Pink', strong purplish pink 7.5RP 7/10.
'Upright Pink', "pink."
'Woking Star', "pink."

FLOWERS PINK TO ROSE, SEMIDOUBLE.

'Falconnet Charlet', moderate pink 5R 8/6 and strong purplish pink 7.5RP 7/10.
‡ 'Phylis Moore', deep pink 2.5R 6/11.
'Rosea Semiplena', "bright pink."

FLOWERS SALMON- TO CORAL-PINK, SINGLE.

'Arthur Hill', strong yellowish pink 7.5R 7/9.
'Aurora', "rose suffused with yellow."
'Azalea', moderate yellowish pink 7.5R 8/6 to vivid red 5R 5/13.
'Boule de Feu', deep yellowish pink 5R 6/11.
'Bunyardii', "salmon-pink."
‡ 'Charming', deep yellowish pink 5F 6/11.
‡ 'Colette', strong yellowish pink 7.5R 7/9 and deep pink 2.5R 6/11.
'Coral Beauty', strong yellowish pink 7.5R 7/9.
'Coral Sea', strong yellowish pink 10R 7/9 and deep yellowish pink 5R 6/11.
'Doctor Bang's Pink', "salmon pink."
'Foliis Rubris', deep yellowish pink 5R 6/11.
'Harlequin', deep yellowish pink 5R 6/11 and rose-pink.
'Hever Castle', strong yellowish pink 10R 7/9.

'Juliet', moderate yellowish pink 7.5R 8/6.

‡ 'Margaret Adams', deep yellowish pink 5R 6/11.

'Maulei', strong yellowish pink 7.5R 7/9 to strong reddish orange 7.5R 5/13.

'Naranja', strong yellowish pink 10R 7/9 and strong purplish pink 7.5RP 5/12.

'Nasturtium', strong yellowish pink 10R 7/9 to strong reddish orange 10R 6/12.

'Salmonea', "clear salmon to rose-pink."

'Sargentii', strong yellowish pink 7.5R 7/9 to strong reddish orange 7.5R 5/13.

'Shinonome', light yellowish pink 7.5R 9/3 suffused with deep pink 2.5R 6/11.

'Tall Large Flowering Salmon', "salmon."

'Tattagawa', "deep brownish pink shaded yellow at the base."

'Tricolor', strong yellowish pink 5R 7/9.

'Versicolor Lutescens', moderate yellowish pink 7.5R 8/6 and strong yellowish pink 7.5R 7/9.

FLOWERS SALMON- TO CORAL-PINK, SEMIDOUBLE.

‡ 'High Noon', strong yellowish pink 5R 7/9 and strong red 2.5R 5/12.

‡ 'Kermesina Semiplena', strong yellowish pink 5R 7/9 to vivid red 5R 5/13.

'Rosea Plena', deep yellowish pink 5R 6/11.

FLOWERS SALMON- TO CORAL-PINK, DOUBLE.

‡ 'Cameo', strong yellowish pink 7.5R 7/9.

'Tsukasa-Botan', "yellowish salmon."

## CLASS IV. **Orange**

FLOWERS TRUE ORANGE, SINGLE.

'Aurea', strong reddish orange 7.5R 6/12.

‡ 'Coquelicot', strong reddish orange 7.5R 6/12 suffused with deep purplish pink 7.5RP 6/12.

‡ 'Corallina', strong reddish orange 7.5R 6/12.

'Dwarf Coral', "orange."

'Dwarf Poppy Red', strong reddish orange 7.5R 6/12.

'Mandarin', strong reddish orange 7.5R 6/12.

'Orange Beauty', "orange."

'Port Eliot', "tangerine-orange."

'Taiojishi', strong orange 2.5YR 7/10.

'Vermilion', strong reddish orange 7.5R 6/12.

FLOWERS ORANGE, SEMIDOUBLE.

'Abricot', "reddish orange."

'Early Orange', "orange with a suggestion of coral."

'Yaegaki', light orange 5YR 8/7.

FLOWERS SCARLET-RED, SINGLE.

'Andenken an Karl Ramcke', "light cinnabar."
'Choshun', "terra cotta."
'Coral Red', "coral-red."
'Dixie Scarlet', "scarlet."
'Dwarf Orange Red', "orange-red."
'Dwarf Red', "coral-red."
'Dwarf Scarlet', "scarlet."
'Ecarlate', "scarlet."
‡ 'Elly Mossel', strong reddish orange 7.5R 5/13 to dark reddish orange 7.5R 4/11.
'Etna', strong reddish orange 7.5R 5/13.
'Fascination', "deep scarlet-red."
'George Landis', "sallow orange-red."
‡ 'Glowing-Ember', strong reddish orange 7.5R 5/13.
'Grandiflora Perfecta', "cinnabar red."
'Grenade', strong reddish orange 7.5R 5/13.
'Hibotan', "bright scarlet."
‡ 'Hi-no-Tsukasa', strong reddish orange 7.5R 5/13 to strong red 5R 4/12.
'Indian Chief', "scarlet."
'Kogyoku', "vermilion."
‡ 'Knap Hill Scarlet', strong reddish orange 7.5R 5/13.
'Momijiyama', "orange-scarlet."
‡ 'Pigmani', strong reddish orange 7.5R 5/13.
'Rakyuo', "vermilion orange."
'Roxana Foster', strong reddish orange 7.5R 5/13.
'Russell's Red', "bright scarlet."
'Salmon', "salmon-red."
'Sämmlinge von Andenken an Karl Ramcke', "cinnabar."
'Tatsugashira', "orange-red."
'Winter Cheer', "orange-scarlet."
'Yuyo', "pale terra cotta with cinnabar suffusion."

FLOWERS SCARLET-RED, SEMIDOUBLE.

'Double Vermilion', "vermilion."
'Fireball', "flame-red."
'Incendie', strong reddish orange 7.5R 5/13.
'Nishikichidon', strong reddish orange 7.5R 5/13.
'Orange', "light red-orange."
'Sunset', strong reddish orange 7.5R 5/13.

'Taioh-Nishiki', vivid red 5R 5/13 and dark reddish orange 7.5R 4/11.
'Wakaba', "pale terra cotta."

FLOWERS SCARLET-RED, DOUBLE.

'Kinjishi', "deep terra cotta."
'Koshi-no-Homare', "bright vermilion-red."
'Ormond Scarlet', "scarlet."

FLOWERS CRIMSON-RED, SINGLE.

'Alarm', "deep red."
‡ 'Arthur Colby', strong purplish red 10RP 5/12.
'Atrococcinea', vivid red 5R 5/13.
'Atrosanguinea', "blood-red."
'Baltzii', strong red 2.5R 5/12.
'Benibotan', "bright red."
'Benichidori', strong red 2.5R 5/12.
'Blood Red', vivid red 5R 5/13.
'Brilliant', strong red 5R 4/12.
'Cardinal', strong red 2.5R 5/12 to moderate red 2.5R 4/10.
'Cardinalis', vivid red 5R 5/13.
'Clarke's Giant Red', strong red 2.5R 5/12.
'Coccinea', "bright red."
‡ 'Cole's Red', vivid red 5R 5/13.
‡ 'Crimson and Gold', strong red 5R 4/12 to dark red 5R 3/7.
'Crimson Beauty', strong red 2.5R 5/12.
'Deep Red', "deep red."
'Ernst Finken', "fiery red."
'Eximia', strong red 2.5R 5/12.
‡ 'Fire', moderate red 2.5R 4/10.
'Fire Dance', vivid red 5R 5/13.
'Hanazono', strong red 5R 4/12.
‡ 'Hollandia', strong red 5R 4/12.
'Jane Taudevin', "bright red."
'Knap Hill Radiance', vivid red 5R 5/13.
‡ 'Leichtlinii', vivid red 5R 5/13.
‡ 'Leonard's Velvety', strong red 5R 4/12.
'Macrocarpa', strong red 2.5R 5/12.
'Natorp's Hybrid', "light red."
'Nicoline', "crimson."
'Otto Froebel', vivid red 5R 5/13.
'Red Ruffles', moderate red 2.5R 4/10.
'Red Sprite', strong red 2.5R 5/12.

'Riccartonii', "deep red."
'Rosy Red', "rosy-red."
‡ 'Rowallane', vivid red 5R 5/13.
'Rubra', moderate red 2.5R 4/10.
'Rubra Grandiflora', strong red 5R 4/12.
'Ruby Glow', moderate red 2.5R 4/10.
'Sanguinea', "crimson."
'San Jose', "deep rose."
'Spitfire', strong red 2.5R 5/12.
'Stanford Red', vivid red 5R 5/13.
'Superba', strong red 5R 4/12.
'Tani-no-Yuki', "bright red with a white base."
‡ 'Texas Scarlet', vivid red 5R 5/13.
'Ulidia', vivid red 5R 5/13 to strong red 5R 4/12.
‡ 'Umbilicata', strong purplish red 10RP 5/12.
‡ 'Vesuvius', strong red 2.5R 5/12.
'Winter Flowering', "bright red."

FLOWERS CRIMSON-RED, SEMIDOUBLE.

'Atrococcinea Plena', vivid red 5R 5/13.
'Atrosanguinea Plena', "bright red."
'Double Red', strong red 2.5R 5/12.
'Kokko', "bright dark red."
'Rubra Plena', "red."
'Sanguinea Plena', "rosy-red."
'Sanguinea Semiplena', vivid red 5R 5/13.
‡ 'Simonii', strong red 5R 4/12 to dark red 5R 3/7.

FLOWERS CRIMSON-RED, DOUBLE.

'Ormond Crimson', "deep red."
‡ 'Red Chief', strong red 5R 4/12.
'Shokko', "fiery crimson."
'Temmei', "intense crimson."

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 APRIL 12, 1963 NUMBER 4

## SUPPLEMENTARY REGISTRATION LIST OF CULTIVAR NAMES IN SYRINGA L. — Registered 1963

(Introduced, or named since publication of 1953 edition of "Lilacs for America.")

Explanatory Note: The Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pennsylvania, was designated the International Registration Authority in 1958 by the Fifteenth International Horticultural Congress (Nice, France) as a result of the publication, "Lilacs for America" published in 1941 and revised and reissued in 1953. Additional lilacs have been registered since 1953 and this list brings the 1953 list up to date.

The format followed in this supplementary Registration List conforms in general to that used in "Lilacs for America" published in 1953 by the Arthur Hoyt Scott Horticultural Foundation, Swarthmore College, Swarthmore, Pennsylvania.

**Explanation of Abbreviations and Symbols**

S – Single flowers D – Double flowers

*Flower Colors*

I White II Violet III Bluish IV Lilac V Pinkish
VI Magenta VII Purple

If there are no parentheses with two or three capital letters to the immediate right of the name, the variety (cultivar) is a form of *Syringa vulgaris*. Cultivars of other species or hybrids have parenthesis ( ) with two or three capital letters as follows:

EH–D Early Hybrid (*S.oblata dilatata*×*vulgaris*)
EH–G Early Hybrid (*S.oblata giraldii*×*vulgaris*)
PR Prestoniae (*S.villosa*×*reflexa*)
VL (*S.vulgaris*×*laciniata*)

Name of Originator and Date of Introduction, if introduced, are in the parentheses after the name. Parentage is given in the second parentheses when known.

## Key to List of Originators or Introducers

| | |
|---|---|
| Alexander | J. Herbert Alexander, Dahliatown Nurseries, Middleboro, Mass. |
| Berdeen | Kenneth Berdeen, Kennbunk, Maine. |
| Boice | Mrs. Van Ness Boice, Friendly Acres, Salt Point, New York. |
| Castle | Miss Minerva S. Castle, Rowancroft Gardens, Meadowvale, Ontario, Canada. |
| Clarke | Clarke Nursery, San Jose, California (Successor to W. B. Clarke 1876–1953). |
| Eaton | Mark Eaton, Lilac Land, Glen Head, N.Y. (Successor to T. A. Havemeyer). |
| Ellesmere | Ellesmere Nurseries, Brooklin, Ontario, Canada. J. Schloen. |
| Gardner | Gardner Nursery, Horicon, Wisconsin. (Successor to Edward J. Gardner 1891–1952.) |
| Havemeyer | T. A. Havemeyer (1868–1936), Glen Head, New York. |
| Lammerts | Dr. Walter E. Lammerts, Descanso Gardens, Livermore, California. |
| Leslie | W. R. Leslie, formerly of Dominion Agricultural Experiment Station, Morden, Manitoba, Canada. |
| Lyden | Mrs. Cora Lyden (Mrs. John J. Lyden), North Monmouth, Maine. |
| Meader | Professor E. H. Meader, University of New Hampshire, Durham, N.H. |
| Nelson | Dr. Caspar I. Nelson, River Falls, Wisconsin, former Professor, North Dakota Agricultural College. |
| Notcutt | E. G. Notcutt Nursery, Woodbridge, Suffolk, England. |
| Oliemans | Oliemans Brothers, Aalsmeer, Holland. |
| Patterson | Mrs. Frank Patterson, Scarborough, Ontario, Canada. |
| Phair | Philip D. Phair, Presque Isle, Maine. |
| Piet | Gebroeder Piet Nurseries, Aalsmeer, Holland. |
| Proefstation | Proefstation v.d. Bloemisterij, Aalsmeer, Holland. |
| Rankin | Dr. John Paul Rankin, Elyria, Ohio. |
| Rowancroft | Rowancroft Gardens, Meadowvale, Ontario, Canada. |
| Schloen | J. Schloen, Ellesmere Nurseries, Brooklin, Ontario, Canada. |
| Skinner | F. L. Skinner Nursery, Dropmore, Manitoba, Canada. |
| Stone | Mrs. Betty Stone, 2253 Nanking Road, Ashland, Ohio. |
| Topsvoort | Topsvoort Nursery, Aalsmeer, Holland. D. Eveleens Maarse. |
| Yeager | Professor A. F. Yeager, d'ed. Former Professor, University of New Hampshire, Durham, N.H. |

## Revision of List of Nurseries offering Comprehensive Collections of Lilacs

The 1953 Edition of "Lilacs for America" listed 38 nurseries. Eleven of these offered less than 25 varieties; twenty offered 25–50 varieties; seven offered over 50 varieties.

By 1962 fourteen of the 38 nurseries had discontinued operations, or drastically reduced the number of varieties offered.

The following nurseries are now offering good selections of varieties:

### United States

* Denotes nurseries not listed in 1953

* J. Herbert Alexander, Middleboro, Mass.

Brand Peony Farm, Faribault, Minn.

Bryant Nurseries, Princeton, Ill.

Cherry Hill Nurseries, West Newbury, Mass.

Christensen Nursery Co., Belmont, Calif.

Clarke Nursery, San Jose, Calif.

Corliss Brothers, Gloucester, Mass.

F & F Nursery, Holmdel, N.J.

Farr Nursery, Weiser Park, Pa.

Edw. J. Gardner, Horicon, Wis.

Clyde Heard, Beaver Avenue, Des Moines, Iowa

Ilgenfritz Nursery Co., Monroe, Mich.

Inter-State Nurseries, Hamburg, Iowa

Jackson and Perkins, Newark, N.Y.

Kingsville Nursery, Kingsville, Md.

Lovetts' Nursery, Little Silver, N.J. (wholesale)

Perkins-de Wilde Co., Shiloh, N.J. (wholesale)

Princeton Nursery, Princeton, N.J. (wholesale)

Siebenthaler Nursery, Dayton, Ohio

Strawberry Hill Nursery, Rhinebeck, N.Y.

Towson Nursery, Cockeysville, Md.

Wayside Gardens, Mentor, Ohio

Wedge Nursery, Albert Lea, Minn.

**Canada**

(Plants can be imported under special permit only)

* Ellesmere Nursery, Brooklin, Ontario

McConnell Nursery, Port Burwell, Ontario

* Rowancroft Gardens, Meadowvale, Ontario

Sheridan Nursery, Clarkson, Ontario

Skinner's Nursery, Dropmore, Manitoba

Thirteen of these nurseries offered less than 25 varieties; six offered 25–50 varieties; nine offered over 50 varieties.

## LILAC VARIETIES

### Named or Introduced since Publication of 1953 Edition of "Lilacs for America"

S I 'Addie V. Hallock' (Boice)

S IV 'Alice Stofer' (Rankin)

S V 'Aladdin' (Leslie?) *S. villosa* hybrid

S I 'Anna Amhoff" (PR) (Yeager 1958 - Alexander 1961) (F2 seedling of 'Royalty')

S IV 'Anna Nickles' (Stone)

S VI 'Berdeen's Chocolate' (Berdeen)

D VII 'Bertha Phair' (Phair about 1950–56) (Seedling of 'Paul Thirion')

D V 'Betty Opper' (Rankin)

S IV 'Betty Stone' (Stone)

S I 'Bloemenlust' (Piet 1956)

S II 'Burgemeester Loggers' (Topsvoort 1961) ('Marechal Foch'×'Ambassadeur')

S VI 'Caroline Foley' (Rankin)

D V 'Cora Lyden' (Lyden)

S VII 'Chris' (Berdeen)

'Daphne' (syn. of *S. microphylla superba*)

S IV 'Directeur Doorenbos' (Topsvoort 1955) ('Excellent' × 'Johan Mansing')

S VI 'Director General Van Der Plassche' (Topsvoort 1961) ('C. L. Baardse' × 'Excellent')

S VII 'Doctor Brethour' (Patterson – Ellesmere 1961)

S III 'Doctor Chadwick' (EH–D) (Skinner)

D IV 'Edgar T. Robinson' (Lyden)

D IV 'Esta' (Rankin)

D VI 'Fantasy' (EH–G) (Clarke 1962)

'Florence Christine' (Stone)

S VII 'Frank Patterson' (Patterson – Ellesmere 1961)

S I 'Geraldine Smith' (Rankin)

S I 'Helen Palagge' (Rankin)

S VII 'Helen Schloen' (Patterson – Ellesmere 1962)

'Ingwersen's Dwarf' (form of *S. velutina*)

S I 'Inez' (Rankin)

D V 'J. Herbert Alexander' (PR) (Lyden) (Seedling of 'James MacFarlane')

S IV 'J. R. Koning' (Topsvoort 1955)

S IV 'Jack Smith' (Rankin)

D IV 'Jane' (Rankin)

D I 'Jennie C. Jones' (Rankin)

I 'Jimmy Howarth' (Patterson – Ellesmere 1961)

S VII 'John's Favorite' (Lyden) (sport of 'Charles X')

'John of Monmouth' (Lyden)

D I 'Ken Berdeen' (Lyden)

S VII 'Lavender Lady' (VL) (Lammerts) (*S. vulgaris* × *laciniata* F2) (Bred for southern California)

S IV 'Lewis Maddock' (Rankin)

S II 'Louvain' (EH–D) (Skinner 1962)

S IV 'Madame Rosel' (Topsvoort)

S IV 'Margaret Opper' (Rankin)

S I 'Martine' (Proefstation 1954)

S II 'Mary Blanchard' (Yeager 1958) (Open pollinated seedling of 'Congo')

S I 'Maud Notcutt' (Topsvoort – Notcutt 1957) ('Excellent' × 'G.J. Baardse')

'Mauve Mist' (Havemeyer – Eaton)

S VII 'Maybelle Farnum' (PR) (Yeager – Alexander 1961) (F2 seedling of 'Royalty')

'Miss Kim' (Yeager 1954 – Alexander 1961) (Dwarf selection of *S. palibiniana* Nakai)

S I 'Mount Baker' (EH–D) (Skinner 1961)

'Mrs. Fannie W. Heath' (Nelson)

'Mrs. Harry Bickle' (Rowancroft catalog #17 undated)

'Mrs. Robert M. Gardner' (Gardner)

S VI 'Nellie Marie' (Lyden)

S VII 'Nellie Bean' (PR) (Yeager – Alexander 1961) (F2 seedling of 'Royalty')

S IV 'Nina Baker' (Rankin)

S I 'Niobe' (Proefstation 1958)

D I 'Oake's Double White' (Meader found in a New Hampshire garden)

S IV 'Pauline Beck' (Rankin)

D V 'President Eisenhower' (Lyden 1960)

S V 'Pink Bluet' (Rankin)

S V 'Pinkinsun' (Rankin)

S V 'Pinkie' (Rankin)

S VII 'Purple Gem' (EH–G) (Clarke 1962)

S IV 'Robert Dunham' (Rankin)

'Romance' (Havemeyer – Eaton)

'Rowancroft Pink' (EH–G?) (Castle 1953)

D I 'Saint Joan' (Castle 1953)

D I 'Saint Margaret' (Castle 1953)

D I 'Snow White' (Oliemans 1958)

D IV 'Sobra' (Rankin)

S III 'Spring Dawn' (EH–G) (Clarke 1960) Patent applied for.

S V 'Spring Glory' (EH–G) (Clarke 1958)

S V 'Spring Glory' (Proefstation 1957)

S I 'The Bride' (EH–D) (Skinner 1961)

D VII 'Tom Taylor' (EH–D) (Skinner)

D IV 'Two Star General' (Rankin)

S II 'Voorzitter Buskermolen' (Proefstation 1954)

S III 'W. T. Lee' (Schloen – Ellesmere 1962)

S I 'Westend' (Proefstation 1956)

S I 'White Surprise' (Castle 1953)

*Note 1:* Correction. 'ROYALTY' is PR (*S. prestoniae*). It was wrongly listed in 1953 as JF (*S. josiflexa*) on pages 41 and 48 of "Lilacs for America."

*Note 2:* 'Mountain Haze' and 'Sierra Blue' raised and named by Lammerts and introduced as Lilacs are not varieties of *Syringa* but are varieties of *Ceanothus* popularly called "California Lilac."

John C. Wister
Arthur Hoyt Scott Horticultural Foundation
Swarthmore College, Swarthmore, Pennsylvania

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 | MAY 31, 1963 | NUMBER 5

## INTERNATIONAL PLANT REGISTRATION

A CONCERTED effort is being made by all botanical and horticultural organizations throughout the world to bring order to the naming of new cultivars (clones or cultivated varieties) of plants. An International Code of Nomenclature for Cultivated Plants was originally drawn up by a special committee representing international and botanical interests and the first edition was published in 1953. Since then it has been the responsibility of a special commission of the International Union of Biological Sciences and the latest edition was published in 1961 (R. A. Howard in *Arnoldia* 21: 1–8. 1961). The code has now been in use for several years. It was slightly modified by the International Horticultural Congress in 1962.

Many organizations and individuals both in America and in Europe are working on national and international registration lists, these to comprise names of all cultivars published in accordance with the Rules of Nomenclature. It is hoped that in the years to come, this Code and the registration lists which are prepared and published under the authority of the International Horticultural Congresses will be the foundation governing the naming of all new cultivated varieties of plants. All those who are about to name new cultivated plants are urged to obtain a copy of the Code from the American Horticultural Society, 1600 Bladensburg Road, N.E., Washington 2, D.C., and to obtain proper registration blanks from the Registration Authority concerned.

The International Registration Authorities which have been appointed to date are listed here, with the genera they are to register in parentheses. An asterisk after the name of a genus indicates that an international registration list has been published. Persons wishing to register new cultivar names in any of these genera should correspond directly with the organization listed for the particular genus.

1. American Association of Botanic Gardens and Arboretums, Mr. Fred B. Widmoyer, Sec.-Treas., Dept. of Horticulture, New Mexico State University, University Park, N.M. Responsible for assigning genera or groups of

woody plants not already assigned to organizations which would serve as National Registration Authorities in the United States.

2. The American Begonia Society, 3628 Revere Ave., Los Angeles 39, Calif. (*Begonia*)
3. The American Gloxinia Society (subject to agreement with the American Gesneria Society), c/o Paul Arnold, 26 Hotchkiss St., Binghamton, N.Y. (Gesneriaceae – excluding *Saintpaulia*)
4. American Hibiscus Society, Box 144, Eagle Lake, Florida. (*Hibiscus* – cultivars of tropical and subtropical species only)
5. The American Iris Society, 2237 Tower Grove Blvd., St. Louis 10, Mo. (*Iris* – excluding bulbous irises)
6. The American Plant Life Society, Box 150, La Jolla, Calif. (*Nerine*)
7. American Rose Society, 4048 Roselea Place, Columbus 14, Ohio. (*Rosa*)
8. Arnold Arboretum, Jamaica Plain 30, Mass. (*Chaenomeles*,* *Cornus*,* *Fagus*, *Forsythia*,* *Gleditsia*,* *Malus*,* *Philadelphus*, *Pieris*,* *Ulmus*.)
9. The Hemerocallis Society of America, c/o Mr. Wilmer B. Flory, 1533 Meadlawn Ave., Loganport, Ind. (*Hemerocallis*)
10. Herrenhausen Institut für Zierpflanzen, Hannover-Herrenhausen, Germany (*Callistephus; Begonia semperflorens* group – subject to agreement with the American Begonia Society)
11. The Holly Society of America, Bergner Mansion, Baltimore 16, Md. (*Ilex**)
12. International Camellia Society, Bodnant Gardens, Tal-y-carn, Denbighshire, No. Wales. U.S. contact: American Camellia Society, P.O. Box 465, Tifton, Georgia. (*Camellia*)
13. International Poplar Commission, Viale delle Terme de Caracalla, Rome, Italy. (*Populus* – forestry cultivars only)
14. Koninklijke Algemene Vereniging voor Bloembollencultuur, 45 Wilhelminastraat, Haarlem, Holland. (*Tulipa;* hardy bulbous and tuberous-rooted plants excluding *Dahlia*, *Gladiolus*, *Lilium* and *Narcissus*)
15. Laboratorium voor Tuinbouwplantenteelt, Wageningen, Netherlands. (*Cyclamen**)
16. Morris Arboretum, Chestnut Hill, Philadelphia 18, Pa. (*Magnolia*)
17. The National Chrysanthemum Society, 83 Chesterfield Road, Barnet, Herts., England. (*Chrysanthemum* – perennials only)
18. The Royal Horticultural Society, Vincent Square, London, S.W. 1, England. (*Delphinium** – perennials only; *Lilium;** *Narcissus;** Orchidaceae; *Rhododendron** – including azaleas. U.S. contact for *Rhododendron:* Dr. Henry T. Skinner, U.S. National Arboretum, Washington 25, D.C.
19. Royal New Zealand Institute of Horticulture, P.O. Box 450, Wellington, N.Z. (*Hebe* – woody Veronicas; *Leptospermum*)
20. Arthur Hoyt Scott Foundation (Dr. John C. Wister), Swarthmore College, Swarthmore, Pa. (*Syringa**)
21. La Société National d'Horticulture France, 84, rue de Grevelle, Paris VII, France. (*Acacia; Dianthus; Hydrangea; Matthiola*)
22. U.S. National Arboretum (Dr. Donald Egolf), Washington 25, D.C. (*Viburnum*)

The following is a summary of the genera or groups assigned to date. The number in parentheses indicates the Registration Authority responsible.

**Acacia** (21)
**Begonia** (2)
**Begonia semperflorens** group (subject to agreement with American Begonia Society) (10)
**Callistephus** (10)
**Camellia** (12)
**Chaenomeles*** (8)
**Chrysanthemum** (perennials only) (17)
**Cornus*** (8)
**Cyclamen*** (15)
**Delphinium*** (perennials only) (18)
**Dianthus** (21)
**Fagus** (8)
**Forsythia*** (8)
Gesneriaceae (excluding **Saintpaulia**) (3)
**Gleditsia*** (8)
**Hebe** (woody Veronicas) (19)
Hardy bulbous and tuberous-rooting plants excluding **Dahlia, Gladiolus, Lilium and Narcissus** (14)
**Hemerocallis** (9)
**Hibiscus** (tropical and subtropical species only) (4)
**Hydrangea** (21)
**Ilex*** (11)
**Iris** (excluding bulbous irises) (5)
**Leptospermum** (19)
**Lilium*** (18)
**Magnolia** (16)
**Malus*** (ornamental species) (8)
**Matthiola** (21)
**Narcissus*** (18)
**Nerine** (6)
Orchidaceae (18)
**Philadelphus** (8)
**Pieris*** (8)
**Populus** (forestry cultivars only) (13)
**Rhododendron*** (includ. azaleas) (18)
**Rosa** (7)
**Syringa*** (20)
**Tulipa** (14)
**Ulmus** (8)
**Viburnum** (22)

The Arnold Arboretum has been appointed the International Registration Authority for several woody plant genera. They are *Chaenomeles*, *Cornus*, *Fagus*, *Forsythia*, *Gleditsia*, *Malus*, *Philadelphus*, *Pieris* and *Ulmus*. Under the auspices of the American Association of Botanical Gardens and Arboretums, the Arnold Arboretum has also been appointed *pro tem.* the National Registration Authority for certain other genera of woody plants which have not been assigned to other organizations. Some of the new plants which have recently been registered by the Arnold Arboretum since January 1, 1960, are here listed, together with short descriptions. The information in quotation marks has been taken directly from the registration records.

**Buxus sempervirens** 'Northern Find'

This plant originated at St. Joseph's Hospital, Hamilton, Ontario, Canada, and was first propagated by the Woodland Nurseries of Cooksville, Ontario, in 1939. The originator is not known, but the plant was introduced commercially about 1955. In the words of Mr. Leslie Hancock, "It is a nicely rounded bush,

capable of growing over many years to considerable height, with a semi-open branching habit. The leaves are oblong-oval, $1-1\frac{1}{4}''$ long, convex, with glaucous bloom on young foliage with an occasional small branch of silver-variegated foliage. It will apparently be normal-appearing at $-25^{\circ}$ to $-30^{\circ}$ F." This has not been widely distributed as yet, but is becoming more and more popular in this section of Ontario, Canada.

**Buxus microphylla koreana** 'Wintergreen'

This clone originated about 1940 in the Scarff Nurseries of New Carlisle, Ohio, was selected in 1950 and introduced in 1960 by that nursery. In the words of Howard N. Scarff, "This plant has shown remarkable ability to retain good green color all through the winter. Even in the extreme cold of our 1958–59 winter, this plant held its color."

**Chaenomeles × superba** 'George Landis'

This was found by George Landis of Esperance, New York, growing at the home of Mrs. Hodgkins of Troy, New York, in 1946. It was taken to the George Landis Arboretum where it had single, sallow orange-red flowers. Mr. Fred Lape, Director of the George Landis Arboretum, made the following notes: "Extremely large bright orange fruit, and heavily fruiting, even though the blossoming may be lean."

**Chaenomeles × superba** 'Jet Trail'

This is a white-flowered sport of 'Texas Scarlet' first observed in 1959 by Harvey M. Templeton of Phytotektor, Winchester, Tennessee, in his nursery and introduced by him in 1961. It is a low-growing shrub with "large, single, pure white flowers with no touch of any color."

**Cladrastis lutea** 'Rosea'

A splendid tree of this has been growing on the grounds of the Perkins Institute for the Blind in Watertown, Massachusetts, for many years. The flowers are pink, with golden yellow bases. Professor Nelson Coon of the Institute sent scions on several occasions to the Arnold Arboretum and to Mr. Robert Marshall of Brimfield Gardens, Wethersfield, Connecticut. It was in the catalogue of this nursery that the name was first listed. It was first described by Dr. Burdette L. Wagenknecht in *Arnoldia* 21, page 20, March 17, 1961.

**Cornus florida** 'Apple Blossom'

Originating at Hoyt's Sons Co. Nurseries of New Canaan, Connecticut, several years prior to 1962 and introduced under the name 'Apple Blossom' by Wayside Gardens of Mentor, Ohio, in 1962. "The blossoms are produced in great abundance, color is an apple blossom pink shading to blush white in the center."

**Cornus florida** 'Cherokee Chief'

Issued Plant Patent 1710 in 1958, this was assigned to I. Hawkersmith, Winchester, Tennessee. The plant is described as having bracts "beautiful deep red, new growth a bright red."

**Cornus florida** 'Cherokee Princess'

Listed in the Tennessee Valley Nursery Catalogue, Winchester, Tennessee, in the fall of 1959 as being a selection of the white flowering dogwood.

**Cornus florida** 'Cloud 9'

Observed first about 1951 and propagated a year later, this originated at the Chase Nurseries of Chase, Alabama. It was issued Plant Patent #2112 on December 26, 1961. It is described as "An extremely precocious bloomer. Exceptionally free-flowering, with more spreading habit of growth than *Cornus florida*. The bracts are oval to round, overlapping, to give bloom a disc effect, rather than a cross effect."

**Cornus florida** 'De Kalb Red'

A sport of the common pink dogwood, first observed in 1946 and propagated in 1947; originating at the De Kalb Nurseries, Norristown, Pennsylvania, and patented by Eugene Muller, Plant Patent #965, July 18, 1950. This is a "semi-dwarf in size, foliage a deep green, deep crimson in fall color with wavy margins. The bracts are a deep, rich, heavy wine-red color."

**Cornus florida** 'Spring Song'

Originating at Hoyt's Sons Co. Nurseries of New Canaan, Connecticut, several years prior to 1962 and introduced under the name, 'Spring Song' by Wayside Gardens, Mentor, Ohio, in 1962. "Outstanding specimens—gorgeous rose-red . . . . superb vibrant show of color."

**Cornus florida** 'Sweetwater Red'

A seedling first flowering in 1940, originating at Sweetwater, Tennessee, and selected in 1954 by the Howell Nurseries of Knoxville, Tennessee, which is listed as both originator and introducer. It was first commercially introduced in 1961. "The bloom is a distinct red, new growth in Spring is red; leaves in the fall are a distinct crimson color. The growth habits are similar to those of the White Dogwood and the trees develop uniformly; the blossoms retain the crimson color and do not fade as previous introductions have done."

**Euonymus fortunei** 'Gold Tip'

A sport of *Euonymus fortunei* 'Sarcoxie' first observed by Leslie Hancock in 1959 on plants of the Woodland Nurseries, Cooksville, Ontario, Canada. It will not be introduced until 1964. In the words of Mr. Hancock, the "young growth

is strongly golden variegated, about 40% golden. This variegation slowly turns to a semi-evergreen as the season advances." In most other respects it should prove similar to its parent *Euonymus fortunei* 'Sarcoxie'.

**Malus** 'Radiant'

An open pollinated seedling of *Malus* 'Hopa' selected by the late Dr. L. E. Longley of the Department of Horticulture of the University of Minnesota, St. Paul, Minnesota, about 1940. Introduced by the Department of Horticulture in 1957 "the tree is compact and upright in growth habit with sturdy, wide-angled crotches. The new foliage in the spring and early summer has a bright reddish cast contrasting nicely with the green of the older foliage. The flower buds are deep red, opening to deep pink, single flowers of medium size. The flowers are produced annually. The fruits are small, bright red, about $\frac{1}{2}''$ in diameter and reach their peak of color in early September. They retain their bright color until heavy freezes in late October."

**Malus baccata** 'Snowdrift'

A seedling of unknown parentage first observed in 1955 and introduced by the Cole Nursery Company of Painesville, Ohio. "Red buds. Glistening pure white flowers of excellent substance. Annual heavy blooming. Small (about $\frac{1}{4}''$ dia.) fruit of yellow color with rosy blush. Extremely floriferous. Vigorous upright growth. Heavy textured, clear green foliage. Highly disease resistant."

**Malus** 'Vanguard'

A twenty-two-year-old seedling first flowering in 1944 and grown from seed of *Malus* 'Hopa' at the University of Minnesota where it was selected by Dr. L.E. Longley of the Department of Horticulture and introduced by the Department of Horticulture in 1963. It was first designated, "11AA." "The tree is upright in habit of growth with narrow crotches. There is a tendency for the top to spread out slightly after several successive crops of fruit, thus producing a vase shaped tree at maturity. The young foliage has a reddish cast, but soon turns a bright green. Flowers are produced in great profusion, even on young trees, often in the nursery row. The flower buds are large and deep pink in color, opening to large, showy single flowers of a bright rosy pink color. The bright red fruits ($\frac{1}{2}''$ in dia.) reach their full color about September 1 and remain on the tree throughout the fall and winter months."

**Malus** 'White Angel'

Possibly a seedling of *M. sieboldii*, first observed in 1955, introduced and registered by Louis M. Beno of Beno's Nursery, Youngstown, Ohio, in 1962. "Glistening white flowers approximately one inch in diameter, borne in clusters of 5 or 6 on huge, delphinium-like spikes extending out in all directions, two or three feet from the main part of the plant in mid-May. The bright scarlet-red fruits

are $\frac{1}{2}''$ in diameter, profusely borne and hold until spring. The fruit gives the entire plant a pendulous appearance.''

**Pieris japonica** 'Compact'

A ten- to twelve-year-old seedling, this first flowered in 1958 where it originated in the garden of Mr. Russell Bettes of Princeton, New Jersey. It was introduced commercially in 1959 by John Vermeulen & Son, Inc., of Neshanic Station, New Jersey. It is noted in the description of this plant that the ''new growth is shorter, the plant is more compact and forms a very nice compact plant with a minimum of pruning.''

**Pieris japonica** 'Dorothy Wyckoff'

This was selected in 1953 at Millburn, New Jersey, and Edward S. Wyckoff of Bedminster, New Jersey, is credited with selecting it. Kingsville Nurseries of Kingsville, Maryland, and John Vermeulen & Son, Inc. of Neshanic Station, New Jersey, jointly introduced it in 1960. It has a compact habit of growth with ''leaves very rich dark green in summer, turning a handsome reddish green in the winter. The flower buds during winter are deep dark red, and in spring when beginning to swell are red to very dark pink, and when the flowers open they are a fine true pink, not pale to white.''

**Pieris japonica** 'Flamingo'

First observed in March 1953, by Mr. A. B. Lambert, 5120 S.E. 28th Avenue, Portland 2, Oregon, in the Lambert Nurseries of the same address, it will probably be introduced by that nursery shortly and may be patented. In the words of Mr. Lambert, it has ''deep pink panicles which do not fade, the panicle size about 11 cm. The florets are 9 mm. long by 7 mm. wide and the leaf is slightly rounder than that of *Pieris japonica*. The new growth is bronzy red.'' Mr. Lambert also stated that it should be hardy in Zone 7 or to about 10° above zero, F.

**Pieris japonica** 'Whitecaps'

Originating at Milltown, New Jersey, this plant was first noted in 1957 by Mr. Ernest G. Christ. John Vermeulen & Son, Inc., of Neshanic Station, New Jersey, will be the introducer. ''It has exceptionally long flower clusters and in its location the blooms last for about six weeks. The color of the flowers is pure white and they are more outstanding than those on other plants of the same species.''

**Pieris japonica** 'White Cascade'

This cultivar of the Japanese Andromeda, originated as a seedling in the nurseries of John Vermeulen & Son, Inc., Neshanic Station, New Jersey, in 1953 and was selected in 1957 and named by Raymond P. Korbobo, 13 Oak Drive, Middlesex, New Jersey. In the words of Mr. Korbobo, it has ''Perfectly clear white

flowers; full flower clusters; fully clothed with foliage all around; flowers stay clear white for five weeks; produces heavy flower set each year."

**Pseudotsuga menziesii** 'Marshall'

An excellent, densely pyramidal form of the Douglas-fir, this was collected with a batch of Douglas-fir seedlings in Colorado about 1930 or 1931 by the Marshall Nurseries of Arlington, Nebraska. The original seedling grew slowly at first, but after it became 12 or 15 feet high, it developed rapidly enough to have the promise of a prime landscape plant. It is becoming increasingly popular with gardener and nurseryman alike.

**Tilia cordata** 'Greenspire'

A twelve-year-old seedling which first flowered in 1956, this originated in the Princeton Nurseries of Princeton, New Jersey. It was introduced commercially in 1961 by the Princeton Nurserymen's Research Associates and the name was published in the Fall, 1961, catalogue of the Princeton Nurseries. It was patented (#2086) on September 5, 1961. It is "exceptionally straight and upright in habit of growth; with branches placed radially around the trunk and forming an upright narrow-oval head without the need of special pruning or staking. It has rapid growth, strong crotches and is resistant to wind damage."

**Tsuga canadensis** 'Greenspray'

A seedling mutation of *Tsuga canadensis* first observed in 1942 by Henry J. Hohman in the Kingsville Nurseries of Kingsville, Maryland, this seedling was estimated to be about twenty years old. It has "spray-like growths that overlap each growth beneath: the center is open and shows plainly the development of each growth made, which is unlike the mounded forms of dwarf hemlocks. The effect is a development of green sprays."

**Tsuga canadensis** 'Rockland'

This seedling originated at Valley Cottage, Rockland County, New York, and was discovered in 1952 when it was about fourteen years old. Herman Brandt of Valley Cottage is listed as the discoverer and Robert W. Pugh of Spring Valley, as the introducer. This is "a vigorous compact growing hemlock whose rapid speed of growth is comparable with the growth of the species and which has a deeper green color throughout the whole growing season." It also has "a habit of developing numerous branchlets on the sides of current growth with a resultant heavier, denser and very compact type of growth, with approximately 2 to 3 times as many leaves per unit of stem as in the species."

DONALD WYMAN

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 AUGUST 2, 1963 NUMBER 6

## LEUCOTHOË FONTANESIANA

THE subject of this article is the valuable broad-leaved evergreen known as Drooping Leucothoë. In it two or three diverse aspects are discussed, each significant in different ways to plantsmen. Firstly, the nomenclatural difficulties and complexities which have led to changes in the botanical name of the plant are explained; secondly, the characters are enumerated by which it may be distinguished from its most closely related species; next the value of the plants are considered from the point of view of horticulture; and finally various cultivated varieties are discussed, listed and described.

### Changes of Name

Only too often taxonomic botanists find themselves under attack when the scientific name of a well known garden plant is changed. It is easy to sympathize with the objections of horticulturists and others, whether they be professional nurserymen or amateur gardeners, but it is not always appreciated that changes are made for definite reasons and not just for the "fun" of it.

There are three main reasons why names change: (1) because of an earlier name which, by the International Code of Botanical Nomenclature, has to be taken into use; (2) because of a change in a plant's classification; or (3) because of an error in identification by which subsequent workers have been misled. All three reasons are well illustrated by the case of the Drooping Leucothoë, generally known as *Leucothoë catesbaei*, but, as we shall see, more correctly called *L. fontanesiana*.

There are two species of Drooping Leucothoë native in the southeast of the United States: *Leucothoë axillaris*, a plant of the coastal plains from southern Virginia to easternmost Louisiana, and *L. fontanesiana* (*L. catesbaei* of gardeners and others) which is a hardier mountain plant confined to Virginia, North and South Carolina, Georgia and Tennessee. They are very closely related and to a greater or lesser extent overlap in all their distinguishing characters (see Green

in *Castanea* **28**: in press). In fact they have frequently been misidentified one as the other.

*Leucothoë axillaris* was introduced into cultivation in Britain as long ago as 1765 according to Aiton (Hortus Kewensis **2**: 69, 1789) but *L. fontanesiana* is not mentioned. In the second edition of this work, compiled by Aiton's son, it is stated to have been introduced in 1793 by the famous nursery firm of Loddiges but there is some doubt about this for in Gordon, Dermer & Edmond's Catalogue of Trees, Shrubs, Plants, Flower Roots, Seeds, etc., which was possibly put out in 1782, one of their plants is listed as *Andromeda axillaris* and another as *A. serratifolia*. However, they are both of them incompletely described and the first valid description of either appeared in 1783, the following year, when the famous French naturalist Jean-Baptiste A. P. Monet, Chevalier de Lamarck (1744–1829), most noted for his theory on the inheritance of acquired characters usually known as Lamarckism and in whose honor the generic names *Monetia*, *Markea* and *Lamarckia* were given, described *Andromeda axillaris*. Whatever the true facts about the first introduction may be it is interesting to note that these plants were first known in a genus different from that used for them today. *Andromeda*, as a genus, was established in 1753 by the famous 18th century classifier and namer of plants and animals, Carl Linnaeus, and gradually more and more species were described and included until it was apparent that the genus contained too heterogeneous a collection of species. Many segregates were split off to form the now well known genera *Phyllodoce*, *Enkianthus*, *Cassiope*, *Zenobia*, *Pieris*, *Lyonia*, *Chamaedaphne* and *Oxydendrum*, many species of which were first described as *Andromeda*. *Leucothoë* was a similar "split" and like several of those just mentioned was first described by David Don in the Edinburgh New Philosophical Journal of 1834 (**17**: 159).* There is no doubt that Don was correct in splitting up *Andromeda* but one can imagine the complaints made by gardeners of his day when the plant which they all knew as *Andromeda axillaris* had to become *Leucothoë axillaris*. This then is an example of a name change due, in this case, to a change in classification.

In 1788, five years after Lamarck's description was published, Thomas Walter, who had been born in Hampshire, England, about 1740 and who settled in North America, published his Flora Caroliniana in which he described a plant *Andromeda catesbaei*, naming it after the earlier botanist and field naturalist of the southeast,

* Out of interest Don named all these genera after classical figures: Cassiope or Cassiopeia was the wife of Cepheus and the mother of Andromeda; Zenobia was queen and heroine of Palmyra in the third century A.D.; Pieris was one of the Muses and associated with Pieria in Thessaly; Leucothoë was the daughter of Orchamus, King of Babylonia, and said to have been changed by Apollo into a sweet-scented shrub. The name of Cassandra, daughter of Priam and Hecuba and loved by Apollo, was proposed as a name for one of the segregates that had earlier, if unknown to Don, been previously called *Chamaedaphne*. One of these genera, *Phyltodoce*, proposed by another botanist, R.A.Salisbury (1761–1829), was similarly named after a sea nymph and Andromeda, the original name proposed by Linnaeus, was the daughter of Cepheus and Cassiope and married Perseus.

**PLATE IV**

*Leucothoë fontanesiana*

Mark Catesby (1682–1749, and who, from 1731 to 1743, had published his pioneer Natural History of Carolina, Florida and the Bahama Islands). This name was then used by botanists for the hardier mountain plant. In fact Asa Gray in the second edition of his Manual of Botany, published in 1856, transferred the name to *Leucothoë* so that it became *Leucothoë catesbaei* (Walt.) Gray (incidentally the abbreviation "Walt." shows that Walter was the originator of the epithet *catesbaei* in another circumscription, and that "Gray" was the author who combined it as a species in *Leucothoë*). Under the name *L. catesbaei* the plant has been widely known ever since both as a native of the southern Appalachians and as a valuable garden plant. However when the remaining fragment of Walter's original specimen, the type specimen as it is called, was examined (as was done by Dr. Bernice G. Schubert in 1946 when she photographed and studied the Walter Herbarium at the British Museum in connection with the production of the 8th edition of Gray's Manual, "largely rewritten and expanded" by the late Professor Fernald) it was found to be the coastal plant, *L. axillaris*. This fact had been suspected earlier, but as soon as it became definitely established Walter's epithet, *catesbaei*, had to be applied to *L. axillaris* as a later synonym and could no longer be used for the mountain plant. In the years between Walter's description in 1788 and Fernald and Schubert's statement of their discovery in 1948 (Rhodora **50:** 218) several other names had been applied to this plant. Fernald and Schubert considered each one that they knew of and found that for various reasons none of them could be used. A new name was therefore proposed, *Leucothoë editorum* Fern. & Schub.* This name was taken up in the 8th edition of Gray's Manual published in 1950 and in the New Britton & Brown, Illustrated Flora, written by Gleason and published in 1952 so that the field botanists and naturalists who use these standard works soon found that they had a new name for the plant they had always known as *L. catesbaei*, a name that had had to be replaced in this case because of an early misidentification of Walter's original plant.

However, although Fernald and Schubert thought they had considered all the names that had been applied to the species, H. Sleumer, publishing taxonomic studies on *Leucothoë* in the German periodical Botanischer Jahrbücher (**78:** 438), pointed out in 1959 that the epithet *fontanesiana* had already been proposed for this species by the German botanist Steudel in his Nomenclator Botanicus (ed. 2. **1:** 88. 1840) and, by the International Code of Botanical Nomenclature which governs the application of the scientific names of plants, was validly published, although in the genus *Andromeda*. This name of course is much earlier than that

* It is perhaps of incidental interest that the epithet *editorum* constitutes an intentional botanical pun and helps to prove that taxonomists are not always without humor when proposing scientific names. In the 8th edition of Gray's Manual of Botany its meaning is given as "of highlands", but the authors of this name were themselves the editors of this edition of Gray's Manual, and it may also be interpreted as "of the editors"!

of Fernald and Schubert and as priority of publication is one of the main principles in the Code it must take precedence. Steudel's name *fontanesiana* (which incidentally commemorates the French botanist Réné Louiche Desfontaines (1750–1833) was therefore transferred by Sleumer to *Leucothoë* and the correct name for the species became *Leucothoë fontanesiana* (Steud.) Sleum. Although not widely known this name has already been taken into use, yet in only two references that I know of so far, one dealing with wild and the other with cultivated plants: it is used by Wood in his revision of the genera of the Ericaceae in the southeastern United States (Jour. Arnold Arb. **42**: 39. 1961) and by Krüssmann in his Handbuch der Laubgehölze (**2**: 52. 1960). Nevertheless it constitutes a further and unfortunate name change caused this time by the discovery of an earlier and validly published name which by the International Code must take priority and stand as correct.

Every one with sense is dismayed at changes in the names of well known plants and the change from *Leucothoë catesbaei* to *L. fontanesiana* is such a change. But if the Code of Nomenclature, worked out over the years and agreed to internationally is to mean anything, one must abide by its consequences. One of the Code's main aims, ironical as it may seem, is to promote nomenclatural stability and it is for this reason that the principle of priority is considered so important. However the Code is only man-made and there are already exceptions to this principle in the conservation of widely used generic names (*Nomina Generica Conservanda*) and several attempts have been made either to conserve well known specific names which are otherwise being upset by the priority of an obscure name or to reject names which would upset a later and well known one. Attempts, by amendments to the Code, to prevent names well known to non-taxonomists from displacement by others which are obscure are not ended and it will be interesting to note the outcome, at the next International Botanical Congress in Edinburgh in 1964, of the various investigations that are being made to define and discover the true size of the problem.

### Leucothoë fontanesiana and L. axillaris

Although *Leucothoë axillaris* was possibly introduced into cultivation before *L. fontanesiana*, and, growing in the coastal plain it is to be expected that it was the first of the two to be discovered and the one most readily available, it is neither so widely known nor so valuable in horticulture today. Both species are in cultivation and as they are closely related they are not easily distinguished. In fact it is perhaps doubtful whether they merit specific separation. This possibility and the characters by which the two may be distinguished are discussed in a paper to be published shortly in Castanea. It is sufficient here to list in a table the characters which were found most useful and reliable for identification.

As will be seen the most valuable characters are those of leaf apex and sepal shape, these are shown in Plate V.

TABLE. Differences between *Leucothoë axillaris* and *L. fontanesiana*

| | *Leucothoë axillaris* | *Leucothoë fontanesiana* |
|---|---|---|
| Petiole length | 2–9(–11) mm. | (5–)7–16 mm. |
| Leaf length * | 4.4–12.5 cm. | 6.2–15.5 cm. |
| Leaf breadth * | 2.0–5.1 cm. | 1.7–4.2 cm. |
| Leaf apex (Plate V, upper) | Types A–D | Types (C &)E–F |
| Number of serrations on the margin of half a leaf | (5–)15–40(–50) | (25–)35–60(–75) |
| Inflorescence length | (1.5–)2.5–4(–4.5) cm. | (3–)4–6(–9) cm. |
| Number of flowers per raceme | 8–30 | 20–60 |
| Sepal breadth (Plate V, lower) | (1.2–)1.3–1.8(–2.2)mm. | (0.8–)1.0–1.3(–1.6) mm. |
| Filament indumentum | papillose and more or less hairy, occasionally epilose | usually papillose only, rarely slightly hairy |

* In order to obtain measurements from comparable leaves, for each specimen studied measurements were taken from the seventh leaf from the top of a mature shoot.

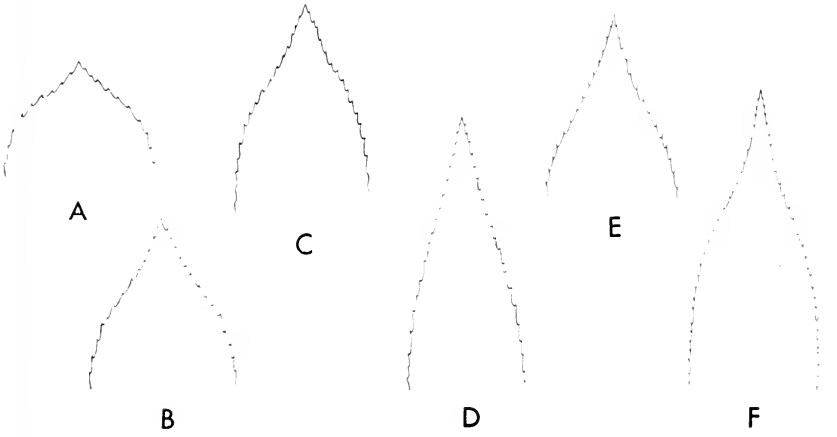
## Horticultural Value

*Leucothoë fontanesiana* is an excellent and hardy evergreen shrub of low stature. The leaves are a dark lustrous green with a tendency to turn bronze in the autumn. The branches, which arise nearer the ground, grow to about 3 ft. and have a tendency to arch and droop slightly towards the top. Under these arching stems the waxy white flowers hang down in racemes of up to about 3 in. long during May or early June. The plants increase their area by underground stems and the species is well suited as an evergreen ground cover as long as one does not require one of lower stature. Under very favorable conditions the shoots may rise in height to four or more feet but the plant can be kept short by cutting to the ground every few years at the end of the growing season.

In its wild state the species occupies wet rocky ground often in shady wooded situations and frequently on the banks of streams. From this it may be safely assumed that it will flourish in damp situations in the garden and can also stand a considerable degree of shade. It will grow in full sun as well but with a chance of damage to the evergreen leaves in winter.

The leaves are remarkably tough, and because of this, cut shoots have a high decorative value for they are longer lasting than those of many similar plants and are especially useful where foliage is required in winter arrangements.

Of the various cultivars, as cultivated varieties are termed, 'Girard's Rainbow' and 'Trivar', when well grown are said to be outstanding plants. The naturally shiny dark green leaves are spotted and streaked with yellow, red and pink. The effect can be cheerful and colorful and quite different from the impression of sickliness which unfortunately goes with many of the poorer types of variegated plant.



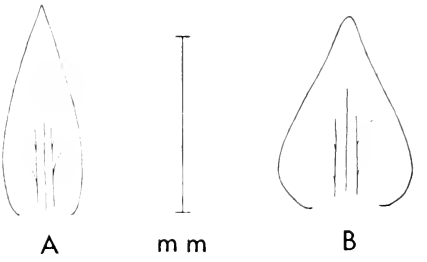




**PLATE V**

(Upper) Range of leaf apex types in *Leucothoë axillaris* and *L. fontanesiana.*: A–D, *L. axillaris;* (C&)E–F, *L. fontanesiana.* (Approximately half natural size).

(Lower) Outlines of a single typical sepal of *L. axillaris* (A) and *L. fontanesiana* (B).

*Leucothoë axillaris* is very similar to *L. fontanesiana* in its horticultural value. The slightly shorter leaves are perhaps a little less attractive but the general habit is of the same type, with graceful arching shoots. Its native habitat is also very similar: swampy banks and wooded creek sides. However, although the Arboretum has had plants growing for a year or two it is doubtful, in view of its native distribution, from the mild coastal plain as opposed to the cooler Southern Appalachian mountains, whether it is as hardy as *L. fontanesiana*. Observations on this point over a number of years in different localities of New England and other parts would help to prove the matter.

Both species are easily propagated. Whole plants may be divided but cuttings can be rooted without difficulty. Similarly they are easily raised from seed and it is true to say that this simplicity of propagation adds considerably to their horticultural value.

**Cultivars**

Although *Leucothoë fontanesiana* exhibits considerable variational range in the wild, no botanical varieties have been described. However, until the International Code of Nomenclature for Cultivated Plants was drawn up and the category of cultivar established, horticultural varieties were treated nomenclaturally under the botanical code. Because of this, one or two varieties recognized in cultivation were named in what are today considered strictly botanical ranks. In 1903 Zabel (in Beissner, Schelle & Zabel, Handbuch der Laubhölz-Benennung 389) published the name *f. angustata* Hort. but without description, yet his use of "Hort." (short for "hortorum"—of gardens) indicated that the plant had already been known by this name previous to his publication. Then in 1914 Bean gave similar publication to another name which had been used in horticultural circles, var. *rollissonii* Hort. (Bean, Trees & Shrubs Hardy in the British Isles **2**: 19. 1914), and gave a description: "a variety with smaller, narrower leaves, 2 to 4 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. wide". It is possible that these two variants are the same plant but from the point of view of valid publication under the botanic code, only var. *rollissonii* Hort. ex Bean has a description. Because of this I borrowed herbarium material of this variety from the Royal Botanic Gardens at Kew, where Bean worked, and I should like to take the opportunity here to express my thanks to the Director for this loan. The specimen sent, whilst it cannot be called the nomenclatural type, may nevertheless be taken as an authentic representation of Bean's plant. It was collected in September 1931 and upon examination shows, as might be expected, a relatively small and narrow leaved plant. On comparison with the extensive range of specimens from wild material in the combined Arnold Arboretum and Gray Herbaria it is found to fall into the general range of variation of the species and certainly, from the botanical point of view, does not merit recogniton at the rank of variety. In so far as it is propagated by cuttings and is maintained for its narrow-leaved character it should be treated as a cultivar.

In examining the literature relating to *Leucothoë fontanesiana* I have come across a number of names applicable to cultivars and it may seem convenient to bring them together and enumerate them here, although little attempt has been made to discover the earliest place of publication of these names, and, partially for this reason and partially because the other species of *Leucothoe* have not been included, this list is hardly to be considered as a complete registration list of cultivars.

'Angusta' (Zabel in Beissner, Schelle & Zabel, Handb. Laub.-Benenn. 389. 1903, as *Andromeda angusta* Hort., in synonymy) = 'Angustata'.

'Angustata' (Zabel, *ibid.* as *Leucothoe catesbaei* f. *angustata* Hort.). Whether this is the same as 'Rollissonii' is difficult to say but certainly they must be very close. A specimen in the cultivated herbarium of the Arnold Arboretum bearing the name as used by Zabel above and gathered in the Vilmorin collection at Les Barres, France in 1910 appears exactly the same, yet another, collected by Zabel in 1886 and 1887 from a plant growing in Hanover obtained in 1885 from van Houtte's nursery at Ghent, Belgium, where it had been growing under the name *Andromeda angusta*, appears much more like the typical plant with larger and broader leaves, but perhaps this was a misidentification.

'Folia Multicolor' (Dolton in Horticulture II. **38:** 349. 1960) = 'Girard's Rainbow' or 'Trivar'.

'Girard's Rainbow' (Registered with the American Association of Nurserymen no. 539, 1957). Originated as a seedling in Girard Nurseries, Geneva, Ohio, in 1949 and described as having foliage which "takes on many colors during the growing period. New shoots are bright red turning to pink, then to yellow, green and copper variations".

'Nana', described as a dwarf form of the species.

'Rainbow' = 'Girard's Rainbow'.

'Rollissonii' (Zabel in Beissner, Schelle & Zabel, Handb. Laub.-Benenn. 389. 1903, as *Andromeda rollissonii* Hort., name only, in synonymy under *Leucothoe catesbaei*, without description; Bean, Trees & Shrubs Brit Is. **2:** 19. 1914 as *L. catesbaei* var. *rollisonii* Hort.). Described as a variety with small and narrow leaves 2 to 4 in. long, $\frac{1}{2}$ to $\frac{3}{4}$ in. wide. Although Bean spelled the name with a single "s" the plant was named either after the brothers George and William Rollisson (who died in 1879 and 1875 respectively) or their father, William Rollisson, who founded the nursery firm of that name at Tootin near London. The name is also incorrectly spelled as 'Rollinsonii' in Chittenden's Dictionary of Gardening **3:** 1159. 1951.

'Trivar' (Registered with the American Association of Nurserymen, no. 521, 1957). Originated as a seedling in de Wilde's Rhodo-Lake Nurseries, Bridgeton, New Jersey in 1947 and described as having "variegated foliage, flecked red, cream and yellow on green, becoming more intense as the season advances towards fall when maximum coloration is evident".

PETER S. GREEN

## TSUGA CANADENSIS AND ITS MULTITUDE OF VARIANTS

*Tsuga canadensis*,* or as it is commonly known, the Canadian, or Eastern Hemlock, has a natural habitat which ranges from Nova Scotia eastward to Minnesota and Illinois, and southward along the mountains to Georgia and Alabama. Not only does it make a superb specimen when grown as an individual in ornamental landscape planting, but it responds well to severe pruning, making it possible to keep it within bounds when used as part of a foundation design.

No other narrow-leaved evergreen has produced such a diversity of forms and, with the increasing interest in dwarf conifers, together with the growth in popularity of horticulture, especially of small and dwarf trees for small properties, the many variants are sought, named and propagated.

Seedlings of Canadian hemlock produce a multitude of variants differing from the normal plant, and many genetic forms have been discovered in the woods by chance while others have been found through planned searches and there is no doubt that more people are walking and camping in the woods today than ever before. Any dwarf or slow-growing variation of a tree located in a natural habitat, is at a serious competitive disadvantage as it would tend to be overgrown or shaded out by other woodland plants, resulting in a very poor survival rate. Canadian hemlock however, has the ability to persist in dense shade, and slow growing forms, therefore, have a better chance of succeeding ecologically where abnormal forms of other subjects might perish. *Tsuga canadensis* is commonly raised from seeds by nurserymen, and still other abnormal forms have appeared and been selected from beds of seedlings or from nursery rows. When one considers the common practice of choosing the best and most vigorous plants in a seedling lot and casting out the runts, one often wonders how many dwarf, pygmy or other abnormal types have been discarded.

* How the name *Tsuga* came to denote hemlock was amusingly related in, "The Hemlock Arboretum Bulletin No. 3" and is quoted as follows:

"In the beginning of scientific botanical practice the hemlock was included with the pines. It was labeled *Pinus canadensis* by Linnaeus in 1763. Michaux, the French botanist, in 1796 grouped it with the firs and named it *Abies canadensis*, while later scientists included it with the spruces and called it *Picea canadensis*. It was the celebrated Austrian botanist, Stephan Ladislaus Endlicher (1804–1849) who in 1847 used the name "*Tsuga*" which is the Japanese name for the hemlock, as a section in his genus *Pinus*. Later Elie Abel Carrière (1816–1896), a famous French botanist, in 1855, classified all the hemlocks into a separate group under the generic name *Tsuga*. Thus this important section of our North American conifers bears a Japanese name, given it by an Austrian, confirmed by a Frenchman and now accepted by scientists generally."

Some idea of the extent of variation in Canadian hemlock is brought out by the fact that in recent years the Arnold Arboretum has received plants or propagating material of fifty-two named and twenty-nine unnamed kinds. The twenty-nine unnamed plants were discoveries considered worthy, by the donors, of perpetuation at a botanical institution.

At the Hemlock Arboretum in Philadelphia, Pennsylvania, the late Mr. Charles F. Jenkins, the owner, attempted to assemble all the various forms of Canadian hemlock. His collection is reputed to have contained one hundred and ninety specimens when he passed away and the project was discontinued. Mr. Radcliffe Pike, Department of Horticulture, University of New Hampshire, who has been interested in hemlock variations for many years, told me that he suspects at least one abnormal hemlock could be located in every New Hampshire town.

Early in the eighteenth century, *Tsuga canadensis* was introduced to Europe where its beauty and desirability were well appreciated, leading to its widespread cultivation. Our Arnold Arboretum records show that variants have been returned to the United States from several European countries.

A search of the Arnold Arboretum's records also reveals that even in the 1880's Canadian hemlock variants were being received. Some were named and others, as is the case with many received today, bore notations such as "dense form", "dense pyramidal" or "variety". Among those named at that time were *Tsuga canadensis microphylla*, *T. c. atrovirens*, *T. c. fastigiata*, *T. c. macrophylla*, *T. c. compacta* and *T. c. pendula*, the latter being the famous Sargent Weeping Hemlock or *Tsuga canadensis* 'Pendula', in the latest usage.

The Sargent Weeping Hemlock is one of the earliest and most beautiful variants ever found and one of the most widely grown in the temperate regions of the world. The find, comprising four plants, was made prior to 1870 by General Joseph Howland near the summit of Mount Fishkill at Beacon, New York. The plants must have been relatively small in size for at that time they were moved down from the mountain and distributed. Two remained in cultivation in the Beacon area and two were sent to the Boston region, one to Mr. H. H. Hunnewell of Wellesley, Massachusetts and the other to Professor Charles Sprague Sargent of Brookline, Massachusetts, who later became Director of the Arnold Arboretum. Mr. Hunnewell's plant failed to survive but Professor Sargent's still exists and has developed into a superb specimen about twenty-eight feet in diameter and approximately seven feet tall. When "Holm Lea", the Charles Sprague Sargent Estate was subdivided in 1928, the portion of property containing the Sargent Hemlock was acquired by Mrs. Roger Ernst who has deep regard for the tree and provides it with every necessary attention. Those wishing to do so may view this magnificent specimen growing near the edge of the street at 170 Sargent Road, Brookline, Massachusetts. The fact that Professor Charles Sprague Sargent had so many plants named for him leads to the supposition that the Sargent Weeping Hemlock is also in this category. However, this is not the

case, as General Howland named it in honor of his New York neighbor, Henry Winthrop Sargent, cousin of Professor Sargent.

As would be suspected in a subject exhibiting such wide natural variation, a great many of the forms are extremely similar, for although discovered and collected from widely separated locations, many specimens appear identical. Some, which resemble one another, can be grouped as dense and shrubby, fastigiate, fountain-like, small-leaved or weeping. It would be difficult if not impossible to find characteristics distinct enough to distinguish between those within similar groups and identify them exactly, should labels ever be lost or interchanged.

A common question asked when visitors to the Arboretum first view these variants is, "How were they developed?" The answer is that they occur spontaneously. However, considering the frequency and apparent ease with which the forms arise it is doubtful whether any possible good can come of continuing to name new variants unless they are particularly different or unusual.

Alfred J. Fordham

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 AUGUST 23, 1963 NUMBER 7

## HEATH AND HEATHER ON CAPE COD

AT present we have some 70 varieties of heath (*Erica*) and heather (*Calluna*) growing successfully without protection on our grounds at Chatham, Cape Cod. This is Hardiness Zone 6 where limits of average annual minimum temperature are $-5^\circ$ F to $5^\circ$ F. These plants are growing on land sloping right down to the salt water, and seem to thrive with their eastern exposure. There is no windbreak of any kind between these plants and the open Atlantic Ocean.

### Charm in Variety

As indicated in lists to follow, there is the widest imaginable variation in height, plant form, color of both foliage and flower, and blooming season. Herein, lies the very special charm of this plant group, which of course is an ericaceous one, requiring acid soil.

Some varieties are but four inches high, others range to five feet. Some are dwarf pincushions, some low and bushy, or low creeping, others loose and upright. There are plants closely resembling club moss, others have the appearance of tree-like clusters of coral.

Apparently there are many differences in the green foliage, including hues of silver, gray, gold and blue; there are light, medium and dark greens, there are plants having yellow or gold foliage turning bright copper in winter. The tips of the branches of one are even a vivid pink.

Flowers vary widely in color depending on the variety and range from white, pale pink, rosy pink, bright pink, coral and crimson to rosy red, ruby, blood red, cherry, purple, lilac and mauve. One of the most satisfying and remarkable traits is the long blooming season of a single plant. For example, our *Erica carnea* 'Springwood White' showed white buds January 8, was completely covered in snow four times during the winter, but as the snow receded, there was the plant half covered with white flowers on March 20, and in mid-April a solid white mat.

Flowers remain into early June. Blooms on some summer-flowering varieties are similarly long-lived.

### Outstanding Varieties in Our Chatham Garden

In any group of plants it is always difficult to name preferences, since all have their own individual character. However, since these have performed at Chatham for several years I am listing some of our favorites here, together with the reason why we think they have especially outstanding ornamental value.

**Calluna vulgaris** varieties:—

'Aurea' – yellow-gold foliage, becoming deep red in winter.

'County Wicklow' – double shell pink flowers, vigorous grower.

'Foxii Nana' – low, moss-like pincushion habit.

'H. E. Beale' – long spikes of silvery pink rosettes of flowers.

'J. H. Hamilton' – choice coral pink – superlative in color.

'Mair's Variety' – one of the best white-flowered varieties.

'Mrs. Pat' – new shoots in spring are a vivid pink.

'Mrs. Ronald Gray' – prostrate ground cover – found on the edge of a North Devon cliff, exposed to Atlantic gales. "Wisely it decided some thousands of years ago that a recumbent position gave the best chance of survival." It has lilac pink flowers and is a great favorite of ours.

'Searlei Aurea' – yellow foliage, white flowers.

'Sister Anne' – crinkled mossy tuft of a plant with downy, silky foliage – a curiosity, yet attractive.

**Erica** species and varieties:—

**arborea alpina** – a tree heath – feathery, light green, miniature Christmas tree. Grows to 5 feet high.

**carnea** 'King George' – blooms in winter – very hardy – crimson flowers.

" 'Springwood White' " " " " " – white flowers.

" 'Vivellii' " " " " " – red flowers.

" 'Winter Beauty' " " " " " – deep pink flowers.

**cinerea** 'Atrorubens' – ruby red flowers.

" 'Golden Drop' – copper to gold foliage turning red in winter.

× **darleyensis** – blooms in winter – vigorous and hardy – rose lilac flowers.

× **watsonii** 'Dawn' – blooms all summer – deep rose flowers.

**vagans** 'Lyonesse' – most attractive plant – ivory white flowers.

" 'Mrs. D. F. Maxwell' – a most attractive plant – cherry-colored flowers.

" 'St. Keverne' – a most attractive plant – pink flowers.

## Inclusive List of Varieties Grown at Chatham, Mass.

| Calluna vulgaris | Height | Flower Color and Blooming Time | Remarks |
|---|---|---|---|
| 'Alba' | 18 in. | white, July–Sept. | |
| 'Alba Plena' | 18 in. | double white, July–Sept. | |
| 'Alportii' | 24 in. | crimson, Aug.–Sept. | |
| 'Aurea' | 18 in. | purple, Aug.–Oct. | foliage gold in summer rusty red in winter |
| 'County Wicklow' | 18 in. | double shell pink, Aug.–Oct. | |
| 'Cuprea' | 12 in. | purple, Aug.–Oct. | foliage gold in summer copper in winter |
| 'Elegantissima' | 24 in. | lilac, Oct.–Dec. | |
| 'Else Foye' | 9 in. | double white, July–Oct. | |
| 'Flore Pleno' | 18 in. | pink and lilac, Aug.–Oct. | |
| 'Foxii Floribunda' | 4 in. | pink mauve, Aug.–Oct. | a round mat |
| 'Foxii Nana' | 4 in. | purple, Aug.–Sept. | a pincushion type |
| 'Hammondii Aurea' | 18 in. | Aug.–Oct. | new shoots are bright yellow |
| 'H. E. Beale' | 24 in. | silvery pink, Aug.–Oct. | considered by some the best of the heathers |
| 'J. H. Hamilton' | 9 in. | double coral pink, Aug.–Oct. | best of the pinks |
| 'Kuphaldtii' | 6 in. | rosy purple, July–Sept. | growth resembles a turban |
| 'Mair's Variety' | 24 in. | white, July–Sept. | |
| 'Mrs. Pat' | 8 in. | light purple, July–Sept. | foliage is a vivid pink in spring |
| 'Mrs. Ronald Gray' | 4 in. | reddish, July–Sept. | flattest growing of all |
| 'Mullion' | 9 in. | deep pink, Aug.–Sept. | |
| 'Nana Compacta' | 6 in. | pink, July–Sept. | pincushion type |
| 'Pilosa' | 12 in. | white, July–Sept. | |
| 'Plena Multiplex' | 18 in. | double pink, Aug.–Oct. | |
| 'Pygmaea' | 5 in. | purple, Aug.–Sept. | |
| 'Rigida' | 12 in. | white, July–Sept. | |
| 'Roma' | 9 in. | deep pink, Aug.–Oct. | |
| 'Rubra' | 24 in. | crimson, July–Sept. | |
| 'Searlei Aurea' | 12 in. | white, Aug.–Oct. | yellow foliage |
| 'Sister Anne' | 6 in. | pink, Aug.–Sept. | |
| 'Tib' | 12 in. | rosy crimson, Aug.–Sept. | |
| 'Tom Thumb' | 6 in. | pink, Aug.–Oct. | resembles a miniature Japanese conifer |
| 'Tomentosa' | 10 in. | lavender, July–Sept. | |
| **Erica** | | | |
| **arborea alpina** | 5 ft. | ashen white, March, April | resembles a miniature Christmas tree |
| **carnea** 'Carnea' | 8 in. | pink, Jan.–April | the entire *E. carnea* group is very hardy and mostly winter blooming |
| " 'Gracilis' | 6 in. | rich pink, Dec.–March | |
| " 'C. J. Backhouse' | 8 in. | soft pink, March, April | |
| " 'King George' | 12 in. | crimson, Jan.–May | |

| Erica | Height | Flower Color and Blooming Time | Remarks |
|---|---|---|---|
| **carnea** 'Ruby Glow' | 8 in. | ruby, March, April | |
| " 'Sherwoodii' | 8 in. | deep pink, Feb.–April | |
| " 'Springwood Pink' | 8 in. | bright pink, Jan.–May | |
| " 'Springwood White' | 8 in. | white, Jan.–May | |
| " 'Vivellii' | 8 in. | blood red, Jan.–May | |
| " 'Winter Beauty' | 5 in. | pink, Jan.–May | |
| **ciliaris** | 9 in. | rosy red, July–Oct. | |
| " 'Stoborough' | 12 in. | white, July–Oct. | |
| **cinerea** 'Alba' | 9 in. | white, July–Aug. | |
| " 'Atrorubens' | 6 in. | ruby red, July–Aug. | |
| " 'Atrosanguinea' | 6 in. | blood red, June–Aug. | |
| " 'Golden Drop' | 4 in. | pink, June, July | foliage gold in summer red and copper in winter |
| " 'Golden Hue' | 12 in. | June, July | actually a foliage plant, similar to above but more golden and taller |
| " 'G. Ford' | 9 in. | carmine, June, July | |
| " 'Mrs. Dill' | 4 in. | bright pink, June–Aug. | |
| " 'P. S. Patrick' | 12 in. | purple, June, July | |
| " 'Violacea' | 12 in. | lilac, June, July | |
| × **darleyensis** | 18 in. | lavender pink, Jan.–May | |
| " 'Arthur Johnson' | 18 in. | pink, Jan.–April | |
| " 'George Rendall' | 12 in. | purple, Jan.–April | |
| **mackiana** 'Plena' | 8 in. | deep rose, May–Aug. | |
| **terminalis** (*E. stricta*) | 4 ft. | pale rose, July–Oct. | a tree heath |
| **tetralix** | 9 in. | rosy pink, June–Aug. | |
| " **alba** | 9 in. | white, June–Aug. | |
| **vagans** 'Lyonesse' | 12 in. | white, July–Oct. | as a group *E. vagans* varieties are favorites because of hardiness and excellent habit, |
| " 'Mrs. D. F. Maxwell' | 12 in. | cherry, July–Oct. | |
| " 'Nana' | 12 in. | white, July–Oct. | |
| " 'St. Keverne' | 12 in. | deep pink, July–Oct. | |
| × **watsonii** | 9 in. | rosy crimson, July–Oct. | |
| " 'Dawn' | 12 in. | rose, June–Oct. | |
| × **williamsii** | 8 in. | rosy pink, July–Sept. | foliage and flower |
| **Bruckenthalia spiculifolia** | 6 in. | light pink, June, July | closely related to *Erica* and *Calluna* |
| **Daboecia** | | | |
| **cantabrica** 'Praegerae' | 12 in. | pink, July–Sept. | closely related to *Erica* and *Calluna* |

Harold W. Copeland
Chatham, Mass.

Having seen Mr. Copeland's garden early this month, especially his excellent heathers in full bloom, I asked him to write this for *Arnoldia*.—Editor

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 | OCTOBER 11, 1963 | NUMBER 8

## PRUNING ORNAMENTAL SHRUBS AND TREES

THIS is one of the times of year when gardeners consider pruning their trees and shrubs. There are special reasons for pruning and this issue of *Arnoldia* is devoted to some of these factors to be considered in any kind of pruning. A little knowledge of what to prune and how to do it goes a very long way in assisting plants to grow into well balanced specimens which prove an asset in any garden. Conversely, the indiscriminate hacking of shrubs and trees at definite heights is the quickest means by which otherwise beautiful plantings are made unsightly.

When pruning is contemplated it might be well to pause a few moments and carefully consider why it is to be done, for many a tree or shrub can grow to be a perfect specimen with no pruning whatsoever. In other words, there are times when contemplated pruning will be found to be totally unnecessary.

### WHEN TO PRUNE

As far as the growth of the plant is concerned, pruning can be done almost any time except in the early summer, but if done then, the new growth may not have sufficient time to mature before winter and killing may result. However, as far as our interest in the ornamental qualities of plants is concerned, shrubs are divided into two groups, those that bloom in the early spring like Daphne, Forsythia and Lilac, which might be pruned after they flower in order to obtain the full benefit of their flower in the current year; and secondly, plants which bloom on the current year's wood like Hydrangea and Rose of Sharon which can be pruned in the late winter or early spring and still be expected to bloom the same year. Trees are usually pruned in the late winter and early spring (with the exception of those that "bleed" profusely like the Birch, Maple, Yellow-wood) for at this time, before the leaves appear, it is much easier to see which branches should be removed, and also it gives the tree the entire spring and summer to form new growth. However, they can be pruned anytime except the "bleeders" as noted above.

## WHAT TO PRUNE

1. **Dead, broken or diseased branches.**

2. **Broken roots and one-third of the branches at transplanting time.** Some roots are always cut when a plant is dug. A good general rule is to remove about one third of the total linear branch length when the plant is moved by thinning out weak or damaged branches and correcting structural defects. This compensates for the loss of roots which have been cut in the transplanting operation, and always results in more vigorous plants at the end of the first year. This is hard for the home owner to do, since the new plant looks smaller than the original specimen purchased from the nursery, but it is always better for the plant in the end. When plants are to be moved from their native place in the woods, it is advisable to root prune (merely forcing a spade into the ground in a wide circle about the plant) one year in advance, to force the production of many roots close to the base so the transplanting operation will be easier. Nursery grown plants are usually root pruned periodically.

3. **Young trees should be pruned early.** Timely corrective pruning saves trouble later. If the tree is one that normally has a single trunk, see that only one straight trunk develops and cut out any others that try to grow. Occasionally several branches grow out from the trunk at the same place and these will always make weak crotches. All but one should be removed. A Dogwood can grow with many leaders from the base. Unless most of these are removed at once, the plant will be a bush (and a poor one at that) and never a fine tree. Sometimes young shrubs should be "headed back" a bit to force them to grow more branches from the base. A Forsythia, for instance, with just one leader would never become an interesting shrub. In other words, know how the tree or shrub will develop at maturity, and help it in early life by selecting the proper leaders, removing the others if necessary.

4. **Correct structural defects.** Never allow two equally vigorous leaders to develop on exactly opposite sides of the same trunk. This will always be a "weak" crotch, susceptible to splitting as the tree grows older. It may spoil the symmetry of the entire tree when this happens.

5. **Cut suckers from the bases of grafted or budded plants.** Many plants used in gardens such as roses, crab apples, lilacs and fruit trees, are either grafted or budded on another kind of understock. Usually, this is never more than a foot or so from the ground. Hence, all suckers developing *below* this point should be removed as soon as they are observed for if allowed to develop they will not only spoil the symmetry of the plant and sap the strength of the variety wanted, but will develop into an entirely different and usually undesirable plant. Excellent examples are often seen of this in roses which have been grafted on understock of *Rosa multiflora*. This species is extremely vigorous and if a few shoots are allowed to grow from the understock, it may not be long before this unwanted part of the plant completely smothers the rose variety which was budded or grafted

on it. Frequently, when two kinds of blossoms or leaves are seen on one plant, this is the reason. Cut out understock suckers as soon as they develop.

6. **Rejuvenate old shrubs.** A Mock-orange, Privet, Lilac, Spirea, or many another shrub may grow too tall and become open and ungainly at the base. Most shrubs can be rejuvenated in one of two ways: either by cutting the entire shrub to 6″ above the ground in the early spring and allowing it to develop as a new plant; or by thinning out the old wood, cutting some of the older branches off near the ground and allowing new ones to form, then repeating the process with a few more of the older branches the second and third years. Lilacs are often treated thus, for in this way they produce a few blooms each year of the change, while when they are cut to the ground they do not bloom for two or three years. Forsythia, as an example, when cut to the ground late in the winter of one year, can bloom with a few flowers the next. The second year it should be covered with bloom.

7. **Hedges, screens and windbreaks.** These should be pruned with the objective of increasing their density, for if a twig is cut back a few inches, it frequently sends out more than one new shoot to take the place of the one removed. This growth habit of plants can be utilized to force them to grow more densely.

8. **Certain limbs for utility purposes.** The lower limbs of street trees, or limbs that interfere with a certain view, walk, window or wire, must sometimes be removed.

9. **Girdling root.** Close observation of the base of poor growing trees often discloses a girdling root, that is a root partly on the surface of the soil or just beneath, that is growing in such a way as to choke or constrict the trunk of the tree or a larger root. Such girdling roots can do real harm and usually should be cut as near as possible to the trunk of the tree or at least at the point where they are doing the damage.

These then, are the reasons for pruning. Be certain the reason for pruning is understood before it is done, for it is always a dwarfing process, and there are some plants that never need any. Study the situation and have a good reason for all pruning.

## HOW TO PRUNE

1. **Make all cuts clean with sharp tools.**

2. **Never leave any stubs.** A short stub may never heal over and is always a source for infection. Make all cuts back to a bud, branch or main trunk. The removal of a large limb should be done in 3 cuts. First, an undercut is made by sawing up one fourth or one third through the limb about a foot from the trunk of the tree. Then the uppercut is started one to two inches beyond the first cut away from the trunk on the top of the branch and sawed down until the limb falls. As the two cuts near each other and the limb begins to sag, its weight will break the wood at the center and the limb will jump clear without stripping and

tearing the bark down the tree trunk. Finally the stump is removed by a cut flush with the trunk of the tree.

3. **Paint all cuts over 1″ to 2″ in diameter with a protective paint.**

4. **Disinfect tools after each cut on diseased plants.** A satisfactory disinfectant to have in a suitable can for this purpose is alcohol.

5. **Shrub rejuvenation.** Thin out the older branches over a period of a few years or cut the shrub to within a few inches of the ground in late winter or early spring. The obvious exception to this would be weak growing shrubs or those which have been budded or grafted. Never cut any shrub off at a horizontal line several feet above the ground. This is an artificial practice, outmoded for many years, and always results in unsightly specimens. Thin out here and there, cut one branch back hard and another not nearly as much and thin out from the base, simultaneously. In this way, an old plant can be reduced in size, still look natural and will produce new growth at different places from the ground on up to the top.

6. **Shear hedges wider at the base than the top.** Both evergreen and deciduous hedges should be sheared in such a way that they are wider at the base than the top, thus allowing the important lower branches plenty of room, light and air. If the hedge is pruned narrower at the base than the top, the lower branches will often die from lack of light. Once these lower branches die on an evergreen hedge, it is practically impossible to force any new ones to grow in the same place. Deciduous hedges, on the other hand, are mostly vigorous growing plants, and when they become open at the base, the entire hedge can be cut to within a few inches of the ground in the early spring and will quickly start a new vigorous growth from the ground, thus forming a new hedge in a few year's time.

Pruning need not be difficult. It is important, however, that one understand exactly why the contemplated pruning is necessary and can vizualize the probable results. Even yews can be heavily pruned and old plants rejuvenated by the expert gardener who has previously studied what to do, and when to do it.

Rhododendrons are more difficult to prune properly, but for those who are interested, there is a full discussion of this on pages 128–134 of "The Arnold Arboretum Garden Book" by Donald Wyman, published by D. Van Nostrand Co., Inc., Princeton, N.J., 1954.

Certain it is that time and effort can be saved if one carefully considers all these factors before adopting a policy of indiscriminate pruning.

Donald Wyman

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 | OCTOBER 25, 1963 | NUMBER 9

## NEW PLANTS REGISTERED

### **Hamamelis intermedia** 'Arnold Promise'

WITCH-HAZELS seem to be the true harbingers of spring. The Japanese *Hamamelis japonica* and the Chinese *H. mollis*, together with the American *H. vernalis*, all bloom early in the spring, sometimes in early March for the two exotic species, and sometimes even on warm days in January for *H. vernalis*. However, the Japanese witch-hazel has not proved an outstanding plant in bloom because the flowers are not profusely borne and are mixed in color with some red, which detracts from the brilliance of the color display in early spring. On the other hand, the Chinese witch-hazel, long noted as a good and fragrant blooming plant, has proved disappointing many years in the Arnold Arboretum because the flower buds have been killed by cold winters.

*Hamamelis intermedia* was named by Alfred Rehder in 1945 from plants grown from seed collected in the Arnold Arboretum in 1928, from a plant of *H. mollis* growing in the Arboretum. There were several lots of seedlings and many plants representing each lot. As these seedlings grew, it became obvious that they were not true *H. mollis*, but were hybrids between this species and *H. japonica*, with characteristics ranging between these two species. One of these seedlings was planted beside the Administration Building where it has been observed from the library and herbarium at all times of year. Such a plant becomes an old friend, known for its performance, counted on because it has been there a long time, and not considered "unusual" for those reasons by those who use the building continuously.

However, for the past several years early spring visitors have remarked about the unusual size and quality of the flowers on this plant, and its consistently good performance. Several visitors who are widely travelled have noted that it stands out from all the other spring-blooming witch-hazels they have seen. Consequently it seems high time that the plant is named.

**PLATE VI**

*Hamamelis intermedia* 'Arnold Promise', a new spring-blooming witch-hazel.

**PLATE VII**

Close-up of flowers, *Hamamelis intermedia* 'Arnold Promise'.

*Hamamelis intermedia* 'Arnold Promise' is the name which it has been given and under which it has been registered by the Arnold Arboretum. It grows vigorously, the original thirty-five-year-old plant now being 18 feet tall and 20 feet broad. The clear, bright yellow flowers are borne usually in threes and appear in early March, although in a warm February some may open during that month. They are about $1\frac{1}{2}''$ across and are profusely produced, a consistent characteristic of this clone.

Mr. Alfred Fordham, propagator at the Arnold Arboretum, has had difficulty in bringing rooted cuttings over the first winter until he worked out a procedure whereby cuttings were placed in flats in June and rooted, but not repotted. Still in the original rooting flats, they were placed in the cold storage pit house in the fall, kept dormant there until March, and then removed to the greenhouse and repotted for the first time. Plants handled in this way started to grow as soon as they were brought into the greenhouse and have made a fine growth of 12″ to 18″ during the first year. It is hoped that this vigorously growing witch-hazel will find popularity in the gardens of those individuals who like to have an early blooming shrub as a cheering promise to winter-weary people, that "spring is just around the corner." Named and registered September 18, 1963.

### Tilia cordata 'Swedish Upright'

The Littleleaf Linden, *Tilia cordata*, is an excellent tree especially for city conditions. It seems to grow better in trying situations than most other trees. Young plants may be dense and compact, but as trees of this species mature, they grow broader at the base, taking on a tightly pyramidal form. The tree now named 'Swedish Upright' by the Arnold Arboretum is definitely columnar in habit, and so worthy of special recognition.

In 1906 Alfred Rehder was in Europe, visiting botanical gardens and herbaria in his search for information to complete his Bradley Bibliography and it was probably while he was in Sweden that he saw a columnar Littleleaf Linden. Scions from this tree were later sent to the Arnold Arboretum and were grafted.

One of these, now a tree on Peter's Hill in the Arnold Arboretum, is 35′ tall, but with a spread of only 5′. What is most important, however, and this can be seen on a close examination of the picture, is the fact that the lateral branches are at right angles to the trunk, more or less regularly produced, while the lower branches dip gracefully toward the ground. This narrowly upright habit, and especially the short side branches, some of which droop gracefully at the base, are what make this tree outstanding among the Lindens. Named and registered by the Arnold Arboretum on September 18, 1963.

### Other New Plants Recently Registered

In addition to the 26 plants briefly noted as registered at the Arnold Arboretum (*Arnoldia* 23: 5, May 31, 1963) are the following: (quotations are taken directly from registration applications).

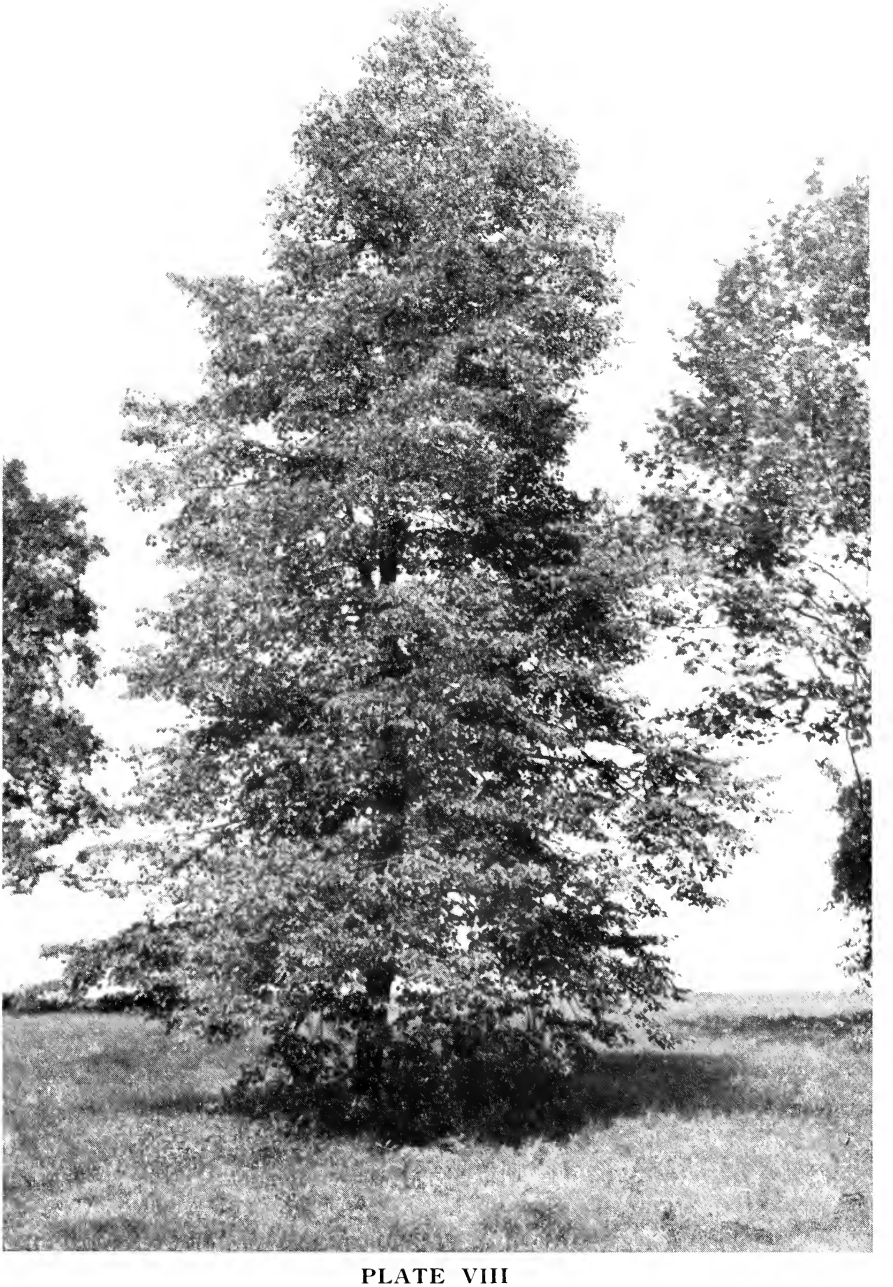


**PLATE VIII**

*Tilia cordata* 'Swedish Upright' on Peter's Hill in the Arnold Arboretum.

**Acer platanoides** 'Emerald Queen'

John H. McIntyre of Gresham, Oregon, is noted as the originator of this clone and A. McGill & Son of Fairview, Oregon, is the introducer, in 1963. It was first observed in 1959 as a one-year seedling, has "a distinct dark green leaf with heavy characteristics. Very straight and vigorous growth in the nursery and older trees seem inclined toward upright branching." Registration received September 5, 1963.

**Buxus sempervirens** 'Belleville'

"The original plant, now 7′4″ tall by 8′6″ in diameter, has maintained a dense globular shape. The young foliage is blue-green, later changing to a rich medium green which it maintains throughout the winter. The foliage is remarkably resistant to winter injury. Seven-year-old plants, though completely exposed, showed no damage after the severe winter of 1962–63, in contrast to all other box. Perfectly hardy at Belleville, Illinois, and at Kennett Square, Pa." Dr. R. J. Seibert of Longwood Gardens, Kennett Square, Pennsylvania, named it, but the original plant was obtained by Mrs. Erwin W. Seibert from the late Mr. Nick Bassler, a nurseryman near Belleville, Illinois, in 1931. The plant is still growing one-half mile south of Scott Air Force Base on Route 2, Belleville, Illinois. Registration received August 21, 1963.

**Chaenomeles** 'Cherry Red'

Unknown as to origin, this plant will be introduced by the Inter-State Nurseries, Inc., of Hamburg, Iowa, in the spring of 1966. "This variety has been grown at Hamburg for at least 50 years. We have many varieties of quince here and this 'Cherry Red' is entirely distinct from any we have here or any we have seen at other places. The bloom is a bright cherry red, almost a flame color. The plant is somewhat upright but spreading at the top as it gets older. It has very fine foliage, practically to the ground. It is almost thornless and blooms regularly. It proves entirely hardy here." So writes Mr. F. R. Sjulin of the Inter-State Nurseries, Inc., Hamburg, Iowa, on the Registration form dated August 12, 1963.

**Malus** 'Garry'

This was formerly referred to as "M.R. #455" by the Canada Department of Agriculture, Research Branch, Experimental Farm at Morden, Manitoba, where it originated and first flowered as a seedling in 1935. The female parent was *M. pumila niedzwetzkyana* and the male parent was probably *M. baccata*. It is noted by Mr. W. A. Cumming, Head of the Ornamental Section at the Morden Experimental Farm as being of "upright habit, slender circling branches and with persistent small bright red fruits," otherwise it has the general flower characteristics of the other so-called "Rosybloom" crab apples. It was introduced by the station in 1962. Registration received May 13, 1963.

**PLATE IX**

Original plant of *Metasequoia glyptostroboides* 'National' shown growing at the U.S. National Arboretum in Washington, D.C.

**Malus** 'Selkirk'

Another of the "Rosybloom" crab apples originating at the Morden Experimental Farm of the Canada Department of Agriculture, Research Branch, and first flowering in 1939, this was introduced in 1962. It was formerly numbered "M.R. 457." Seed was taken from a tree of *M. baccata* and was apparently the result of a cross with *M. pumila niedzwetzkyana*. It is a "strong growing, rounded tree; bright rose, flat-faced flowers, mostly clustered at the ends of the branches giving a garlanded effect; bright scarlet fruits in early August." Registration received May 13, 1963.

**Metasequoia glyptostroboides** 'National'

A selection from many seedlings grown by the National Arboretum in Washington, D.C., from seed collected in China and distributed by the Arnold Arboretum. This was first observed in 1958 as differing from nearly 200 other seedlings, being "one of several narrow-pyramidal and compact types. In all other respects this cultivar is similar to other fast-growing seedlings of this species." Registration received June 5, 1963.

**Philadelphus** 'Audrey'

A cross between *P. grandiflorus* and *P. lemoinei*, this was originated and first introduced (1962) by the Canada Department of Agriculture, Research Branch, Experimental Farm at Morden, Manitoba. "It is hardy in the southern part of Zone 2 and is registered because of its upright, compact habit, floriferousness and hardiness." Registration received May 13, 1963.

**Philadelphus** 'Marjorie'

The Canada Department of Agriculture, Research Branch, Experimental Farm at Morden, Manitoba, introduced this seedling in 1962. It first flowered in 1942 and is a seedling of *P. grandiflorus* with *P. lewisii* listed as the pollen parent. It is listed as perfectly hardy in the southern part of Zone 2, with "arching branches and floriferousness." Registration received May 13, 1963.

Donald Wyman

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 NOVEMBER 29, 1963 NUMBER 10

## FRUITING OF YEWS

YEWS are generally dioecious but occasionally certain plants will bear both staminate and pistillate flowers. Unfortunately little is published on this subject. To initiate such a study, all the yew plants growing in the Arnold Arboretum were carefully observed this fall, together with many in the Secrest Arboretum of the Ohio Agricultural Experiment Station at Wooster, Ohio. It is not very difficult to differentiate between the male and female flower buds at this time of year. The following, then, is a record of how these individual plants will flower in 1964. It is hoped that these same plants will be rechecked several times in the future as a means of determining whether any change their sex.

The numerals appearing after certain plants in this list are the Arnold Arboretum accession numbers for those plants now growing in the Arboretum collections or nurseries. Those without record numbers were observed in the Secrest Arboretum. Most of the varieties in the Arnold Arboretum were also observed in the Secrest Arboretum and in most cases the sex of the plants was identical.

Of course, when yews are grown from seed, seedlings of both sexes result. When propagated asexually by cuttings, the cuttings should be of the same sex as the parent plant. It is unfortunate that in the past many commercial growers have raised seedlings from clones and then applied the same clonal name to the seedlings. This has resulted in much confusion and undoubtedly it is the reason why some clones are now showing some sexual variance.

We welcome correspondence with those who have information differing from that listed here, as well as with those individuals who may have kept annual notes on individual plant bloom. With some 120 different yews being offered by American nurserymen and with new ones being named each year, the nomenclature is considerably confused and in many cases the same plant is being offered under several different names.

This list will be of value to the amateur gardener since both male and female clones are necessary if the female plants are to produce fruit.

## Sexes of Taxus Clones

All plants have been observed in October 1963, either in the Arnold Arboretum or in the Secrest Arboretum. The record numbers refer to the plants in the Arnold Arboretum. (f = female or fruiting; m = male or pollen bearing.)

Taxus baccata 2892 f
1315-30 f
543-32 f
935-34 f
370-35 A, B f
371-35 f
372-35 D, E f
291-44 f
26-39 B, C m
— — 'Adpressa' 18725 B, C f
764-58 f
— — 'Adpressa Stricta' 694-36 B m
— — 'Aurea' 13393 f
— — 'Cheshuntensis' 801-37 m
— — 'Columnaris' 820-58 m
— — 'Dovastoniana' 530-32 f
806-37 f
— — 'Elegantissima' 11332 B m
1174-50 m
1048-53 m
— — 'Erecta' 682-33 f
768-33 m
— — 'Ericoides' 1114-38 f
725-41 f
— — 'Linearis' 1197-28 B m
— — 'Lutea' 1030-38 f
973-49 f
1588-52 f
— — 'Mioun' 1081-59 m
— — 'Neidpathensis' 1031-38 m
— — 'Nigra' 16400 m
— — 'Overeynderi' 365-42 m
— — 'Pendula' 1112-28 m.
816-56 m
— — 'Repandens' 3560 f
5219 f
1113-28 f
— — stricta 209-53 f
— — 'Variegata' 17399 B f
— — var. 1329 f
536-32 f
546-32 f
— canadensis 'Stricta' 898-36 f
— chinensis 654-39 m
— cuspidata 13470 B f
17404 A, C, E, F, G m
17404 D f
17652 A, B m
20374 m
22087 f
— — 393-43 f
254-55 f
526-59 m
2672 B m
— — 'Aristocrat' f
— — 'Aurescens' 34-52 f
10334 m
— — 'Bobbink' f
— — 'Bulkii' 74-59 m
— — 'Columnaris' 40-52 m
— — 'Densa' 5218 f
5714 A, C f
— — expansa 13392 m
727-41 A, B m
— — 'Intermedia' 25-52 m
— — 'Jeffrey's Pyramidal' 173-58 f
— — 'Nana' 5217 m
5217-1 C f
21260 A, C f
22466 f
7968 A, B m
— — 'Nana Compacta' 397-58 A f
397-58 B m
— — 'Payne's Spreading' 529-59 m
— — 'Prostrata' 957-49 B, C, D m
— — 'Robusta' 473-48 m

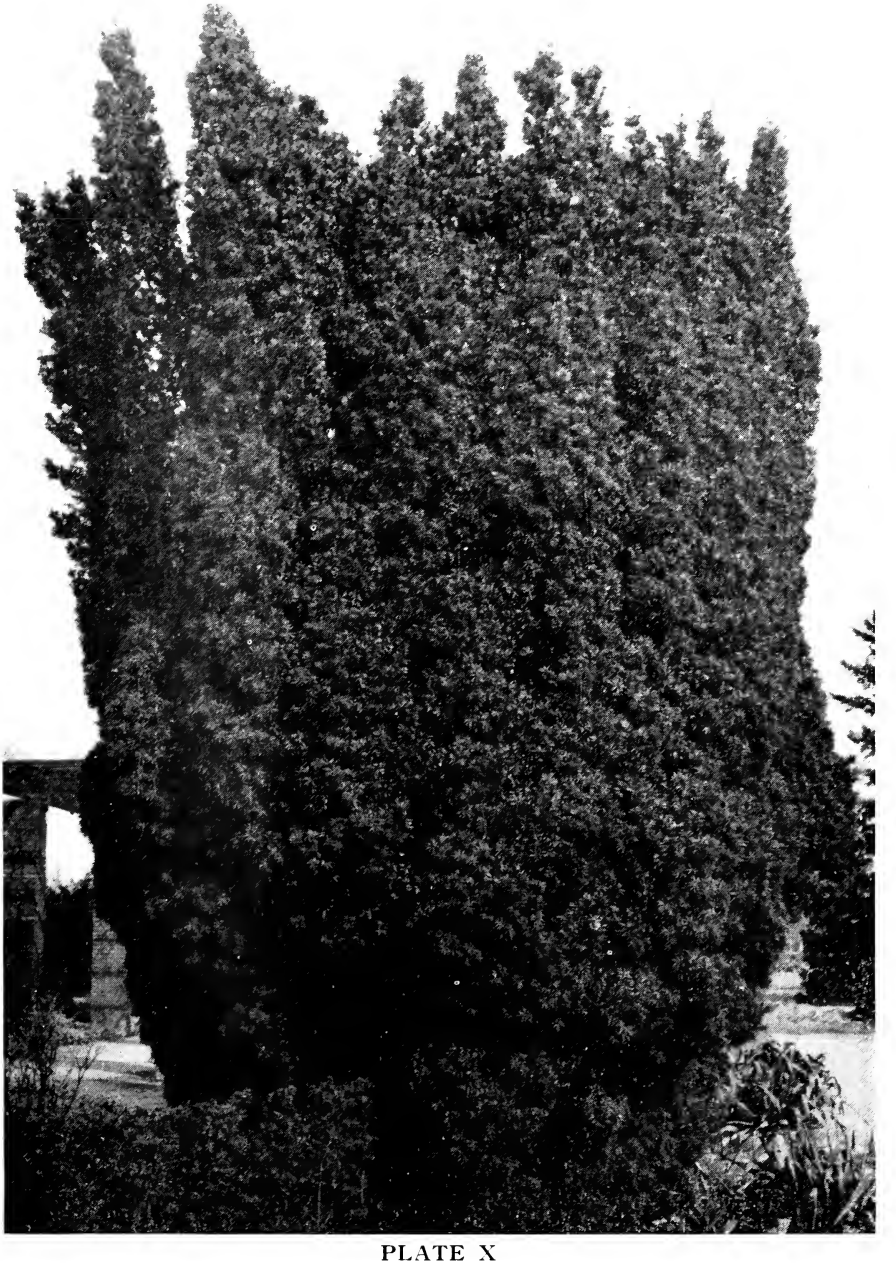


**PLATE X**

This excellent specimen of the Irish Yew (*Taxus baccata stricta*) was photographed in the arboretum of the Agricultural School at Wageningen, Netherlands, in 1951.

Taxus cuspidata 'Thayerae' 17653 C, E, G, H, I, J, L, M, N, T, U, AA, CC, DD, EE, FF, II f

— — 'Thompson' 1031–60 f

× — hunnewelliana 17642 C f
10760 B m
17643 f
17644 B f
19110 f

× — media 38–52 m
10762 B m
11267 m
17645 A, B m
17646 f
17647 B f

× — — 'Adams' 512–56 m

× — — 'Andorra' 20–60 f

× — — 'Amherst' m

× — — 'Anderson' 302–38 A f
302–38 B m

× — — 'Berryhill' 414–58 f

× — — 'Brevicata' 31–52 A, B m

× — — 'Brownii' m

× — — 'Brownhelm' f

× — — 'Cedar Hill' 991–49 m

× — — 'Chadwick' 1279–60 f

× — — 'Cliftonii' 69–50 f
105–59 f

× — — 'Cole' f

× — — 'Compacta' f

× — — 'Costich' 27–60 m

× — — 'Densiformis' 210–53 m

× — — 'Devermannii' 366–56 f

× — — 'Donewell' f

× — — 'Drulia' f

× — — 'Dutweiler' 735–36 A, B m
30–52 f
939–55 m

× — — 'Erecta' 766–60 (1 pl. m; 2 pls. f)

× — — 'Fastigiata' m

× — — 'Flemer' f

× — — 'Flushing' 500–60 f

× — — 'Green Mountain' 709–60 (*Note:* both male and female flower buds were observed on the same plant)

× — — 'Halloran' 511–56 f

× — — 'Hatfieldii' 17648 A, B, C m
17649 B, C m

× — — 'Helleri' 1090–59 m

× — — 'Henryi' 207–53 m
111–59 m

× — — 'Hetz' f

× — — 'Hetzalh' f, m (both at Secrest)

× — — 'Hicksii' 8036 A, D f
10711 m
317–33 B f

× — — 'Hillii' 22–60 m

× — — 'Hiti' 759–58 m

× — — 'Hoogendorn' f

× — — 'Hoytii' 99–60 m

× — — 'Hummeri' 108–59 m

× — — 'Kallay' 172–58 (2 pl. f and 2 pl. m)

× — — 'Kelseyi' 555–37 B f

× — — 'Kelsey's Upright' 468–48 f

× — — 'Lodi' m

× — — 'Microphylla' 934–39 f

× — — 'Moon' 36–52 f

× — — 'Natorp' f

× — — 'Newport' 1014–55 m

× — — 'Ovata' 469–63 f
35–52 f

× — — 'Pilaris' 466–48 m

× — — 'Pilaris Grandiflora' 471–48 m

× — — 'Sebian' 26–60 m

× — — 'Sentinalis' 468–48 f

× — — 'Stovekenii' 39–52 m

× — — 'Stricta Viridis' 470–48 m

× — — 'Taunton' 990–49 m

× — — 'Totem' f

× — — var. 36–52 f
497–52 m
1049–53 f

× — — 'Vermeulen' 864–59 f

× — — 'Ward' 692–42 A, B f
28–52 f

× — — 'Wilsonii' 652–61 m

DONALD WYMAN

# ARNOLDIA

A continuation of the
BULLETIN OF POPULAR INFORMATION
of the Arnold Arboretum, Harvard University

VOLUME 23 DECEMBER 13, 1963 NUMBERS 11–12

## TREE TRUNKS

THIS is the time of year when the trunks of certain trees have a prominent beauty all their own. Although we plant trees for many purposes, we appreciate the ornamental value of the trunks most during the five months of the year when deciduous trees are leafless. Their outline and branching habits, as well as the color, texture and form of the trunks, are their outstanding ornamental assets in winter and many are selected for planting with these factors primarily in mind.

The twenty-eight shown in this issue of *Arnoldia* are not necessarily the best but each has a distinctive character, which frequently becomes more apparent as the tree matures. The *Eucalyptus* is, of course, a native of Australia. *Castanea sativa*, *Quercus suber* and *Taxus baccata* are native of Europe. *Acer davidii*, *A. griseum*, *A. triflorum*, *Broussonetia papyrifera*, *Eucommia ulmoides*, *Lagerstroemia indica*, *Pinus bungeana*, *Prunus serrula*, *Quercus variabilis* and *Stewartia koreana* are natives of western Asia. The remaining fourteen illustrated are natives of North America.

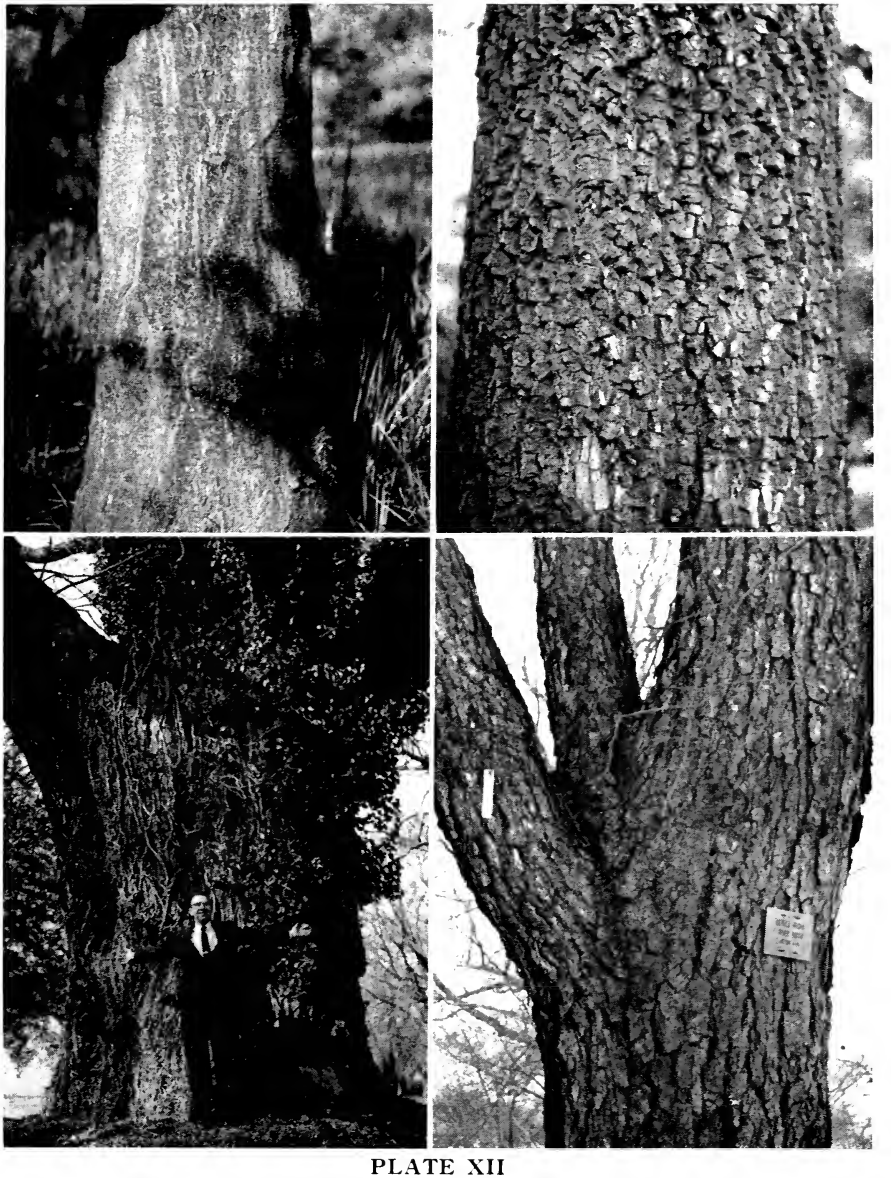
There are many other trees, the trunks of which are outstanding in winter. Among the most striking are: *Acer pensylvanicum* (Striped Maple), *Betula papyrifera* (Canoe Birch), *Cladrastis lutea* (Yellow-wood), *Parrotia persica* (Persian Parrotia), *Phellodendron amurense* (Amur Cork Tree), *Pinus sylvestris* (Scotch Pine), *Platanus* species (Plane Trees), *Populus tremuloides* (Trembling Aspen), *Prunus* species (Cherries), *Sorbus alnifolia* (Korean Mountain-ash), *Syringa amurensis japonica* (Japanese Tree Lilac) and *Ulmus parvifolia* (Chinese Elm).

Though certain of the trees illustrated here are not hardy in the northeastern part of the United States, most of them will be recognized quickly by individuals who have studied trees and their characteristics. The photographs were taken either by Mr. Heman Howard of the Arboretum staff, or by the author.

DONALD WYMAN

**PLATE XI**

(Upper left) *Prunus serrula.* (Upper right) *Acer triflorum*—Threeflower Maple. (Lower left) *Pinus bungeana*—Lace-bark Pine on the old Sargent estate, Brookline, Mass. (Lower right) *Juglans nigra*—Black Walnut at Williamsburg, Va., 200 years old.



## PLATE XII

(Upper left) *Carpinus caroliniana*—American Hornbeam. (Upper right) *Diospyros virginiana*—Common Persimmon. (Lower left) *Liriodendron tulipifera*—Tulip Tree, James River, Va., 400 years old. (Lower right) *Betula nigra*—River Birch.

**PLATE XIII**

Not completely hardy in the northeastern United States.

(Upper left) *Acer davidii*—David Maple. (Upper right) *Lagerstroemia indica*—Crape-myrtle. (Lower left) *Chamaecyparis lawsoniana*—Lawson False Cypress. (Lower right) *Broussonetia papyrifera*—Common Paper-mulberry, Williamsburg, Va.

**PLATE XIV**

(Upper left) *Quercus variabilis*—Oriental Oak. (Upper right) *Eucommia ulmoides*. (Lower left) *Stewartia koreana*—Korean Stewartia. (Lower right) *Betula populifolia*—Gray Birch.

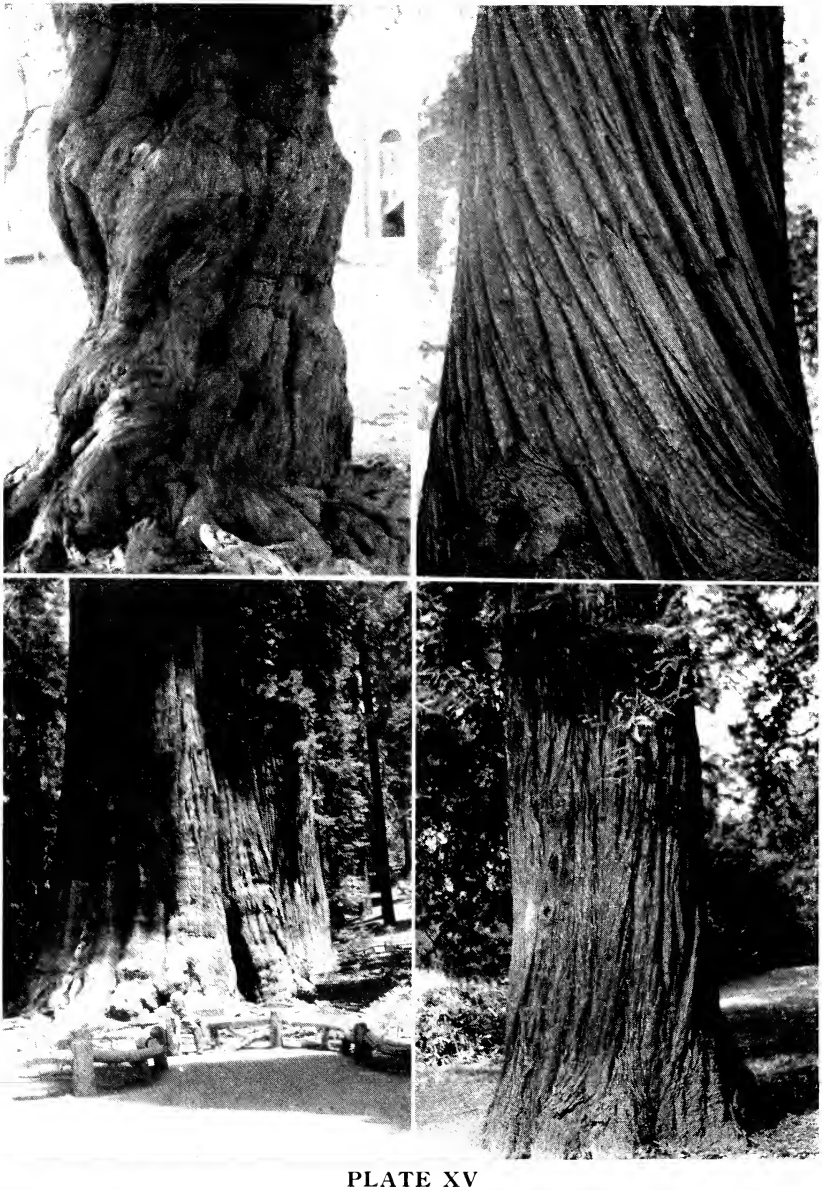


**PLATE XV**

Not completely hardy in the northeastern United States.

(Upper left) *Taxus baccata*—English Yew, Williamsburg, Va., over 200 years old. (Upper right) *Castanea sativa*—European Chestnut, Royal Botanic Gardens, Kew, England. (Lower left) *Sequoiadendron giganteum*—The General Sherman Tree, Sequoia National Park, Calif. (Lower right) *Sequoia sempervirens*—Redwood, Royal Botanic Gardens, Kew, England.

**PLATE XVI**

(Upper left) *Carya ovata*—Shagbark hickory. (Upper right) *Acer griseum*—Paperbark Maple. (Lower left) *Ostrya virginiana*—Hop Hornbeam. (Lower right *Fagus grandifolia*—American Beech.

**PLATE XVII**

(Upper left) *Eucalyptus gunnii*—Loch Fyne, Scotland. (Upper right) *Abies procera*—Noble Fir, Loch Fyne, Scotland. (Lower left) *Pinus ponderosa*—Ponderosa Pine. (Lower right) *Quercus suber*—Cork Oak, Cornwall, England. (The Eucalyptus and Cork Oak are not hardy in the northeastern United States.)

## INDEX TO VOLUME XXIII

Illustrations are in **bold face** type