4-1-1931

The Shrubs and Climbing Vines of South Dakota

N.E. Hansen

Bulletin 263 August, 1931

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CRATAEGUS

Many of the native hawthorns of South Dakota are very desirable for ornamental planting. They are small trees but will flower in shrub form also. The horizontal branches of many of these hardy hawthorns repeat the flat lines of the prairie so they are eminently suited for landscape gardening upon the prairie. (S. D. Agr. Exp. Sta. Bul. 260, page 18.)

Horticulture Department
Agricultural Experiment Station
South Dakota State College of Agriculture
and Mechanic Arts
Brookings, S. D.

TETONKAHA ROSE

This was developed by N. E. Hansen from the wild rose found at Lake Oakwood about 18 miles northwest of Brookings. This is the first of the fifteen varieties of roses originated and sent out by N. E. Hansen. (See South Dakota Bulletin No. 240.) The Tetonkaha is a very free bloomer and is used for hedges or for single specimens in the shrub border. The color is a deep pink. It has about 18 to 25 petals. This is very fragrant. The most double of this series is the Sioux Beauty which was introduced in 1927. Pedigree is Tetonkaha x American Beauty. This is very double and has nearly or quite 100 petals and petaloids. More hardy varieties are on the way.

The Shrubs and Climbing Vines of South Dakota

N. E. Hansen

This bulletin should be studied in connection with the following bulletins:

South Dakota Bulletin No. 224, May, 1927.
Plant Introductions.

South Dakota Bulletin No. 240, June, 1929.
Hardy Roses for South Dakota.

South Dakota Bulletin No. 246, March, 1930.
The Shade, Windbreak and Timber Trees of South Dakota.

South Dakota Bulletin No. 254, October, 1930.
Evergreens in South Dakota.

South Dakota Bulletin No. 260, May, 1931.
The Ornamental Trees of South Dakota.

In these bulletins the experience at Brookings and throughout the state with trees and shrubs is summarized.

Notes on the arrangement of shrubs in groups are given in Extension Circular No. 280, "Beautifying the Home Grounds" by A. L. Ford, South Dakota State college. The literature on landscape gardening is extensive. A late manual on shrubs is "The Book of Shrubs" by Alfred C. Hottes (35).

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The Relation of Hardiness of Trees and Shrubs to Their Geographical Origin.

"In Conclusion. Seven Sylvan Suggestions. A careful study of the native habitat of the over five hundred plants mentioned in this bulletin will repay the lover of plants. The following deductions may fairly be made:

1. Faulty methods of propagation, especially the use of tender or uncongenial stocks, sometimes give hardy plants a bad name. The foregoing list of trees and shrubs, would have been larger, notably in Prunus and Pyrus, but for the winter-killing of the tender roots or stocks, making definite judgment unsafe.

2. As a rule, plants from Japan, most of China, the southern and central parts of Asia and Europe, and the milder coast regions of the United States, are not hardy in South Dakota. In other words, plants from a comparatively mild, moist coast climate are not adapted to a dry continental climate. Man readily adapts himself to such environments and finds the climate salubrious, but plants have no power to provide against such extreme changes.

3. Plants from the drier, interior northern parts of Europe and Asia prove hardy in South Dakota. This suggests the thought that tree planters in the hearts of the three continents in the northern Hemisphere, North America, Europe and Asia, might with natural advantage exchange all the treasures of their flora for trial.

4. Many plants can not adapt themselves to a change in location nor to cultivation in open exposure. Some hardy, native plants, which flourish in sheltered places or on moist land, fail on dry upland. Some plants are strong and aggressive, while others are retiring and dependent.

5. Trees and shrubs extending over a wide geographical range vary greatly in hardiness according to their locality. Hence great care should be taken in the selection of seeds and plants. This variation in hardiness points to a slow process of acclimation by nature. De Candolle writes in "The Origin of Cultivated Plants": "The northern limits of wild species * * * have not changed within historic times although the seeds are carried frequently and continually to the north of each limit. Periods of more than four or five thousand years, or changements of form and duration, are needed apparently to produce a modification in a plant which will allow it to support a greater degree of cold."

6. We should take full advantage of this great work done for us by nature in acclimating plants, and cultivate our local form of the native species instead of the form adapted in the course of thousands of years to a mild, moist climate.

7. This fundamental thought, to work with, and not against, nature in the adapting of plants to our prairie climate, underlies all efforts in the improvement of plants, both fruit and ornamental, which is the main line of work of this department." N. E. Hansen (9).

The above generalization as to hardiness was published in 1901, and is confirmed by the experience since that time.

Plants from Siberia, especially eastern and central Siberia, are hardy in South Dakota. Plants from farther south in Siberia are of less degree of hardiness. For example, Redvein Crab (**Malus niedzwetzkyana**) from the Semiretchinsk province is not hardy in open exposure in South Dakota, and plants from further south in Turkestan are even less hardy. However, this is modified by elevation. Southern plants from the mountains may be hardy against cold, because the winter temperature is low.

Many trees and shrubs have been introduced into cultivation from the mild southern part of their geographical range. The introduction should be repeated from the extreme northern portion of the geographical range. This is the case with Wisteria, introduced originally from Japan. The Mongolian form of Wisteria should be introduced.

An example of this variation in hardiness is when the Boxelder (**Acer negundo**) was found lacking in hardiness at Moscow, Russia, because it was introduced from the St. Louis, Missouri, region. Later it was imported from Manitoba and the tree proved hardy. Many other examples might be given. Great care should be taken in introducing plants into cultivation. Farther north the northern types should be cultivated while for the far South the southern types should be planted. Plants from Mongolia are hardy because they are from the dry upland prairie region. As a class the many choice plants from Japan lack in hardiness on the open prairie because they are from a mild very moist climate. When grown they should be given a sheltered place and special care given as to watering and especially plenty of water in the fall before winter sets in.

The question of hardiness of trees and shrubs resolves itself largely into a study of comparative climates and their effect upon vegetation. Northern plants cannot be brought too far south with success because they do not hibernate well in winter. Plants from northern Manchuria are hardy while those from southern Manchuria are tender here. Southern Manchuria borders on the Yellow sea and has a mild climate, while in northern Manchuria the climate is the same as in eastern Siberia.

The hardiness of trees and shrubs depends largely on the winter covering. If the plants are covered with a deep layer of snow, they are protected and the severity of the winter does not matter. The real test comes in a dry autumn with no snow on the ground during the coldest part of the winter. Here drying out, or winter dessication as it is termed, is an important factor. We can help this by giving trees and shrubs whenever possible a heavy watering before winter sets in so that the plant goes into winter with wet roots. This will help the plant endure the extreme dessication by the drying winds of winter.

Isotherms or lines of equal temperature, should be studied in connection with plant hardiness. We learn that it may be warm in the north during a short period in summer and very cold during the short period in winter far south. A study should be made of the range in temperature between winter and summer. It is a safe rule to follow that the plants from the dry prairie or steppe inland region of the old or new world will find a congenial home under similar climatic conditions upon other continents.

Plants can not be modified quickly by selection to endure a greater degree of cold. Plant selection sifts out the plants of varying hardiness in a plant population. But after all, selection is simply a sieve, and after

many years of sieve-shaking there is nothing left that is hardier than the original stock that was there in the first place. In other words acclimatization, the successful attempt of man to adapt plants to a climate, is not possible. Acclimation, the work of nature, is possible. In a general way the principle laid down by De Candolle still stands: that a period of "more than four or five thousand years, or changements of form and duration, are needed apparently to produce a modification in a plant which will allow it to support a greater degree of cold."

For hardiness we must look to the cold climate regions. Hardy trees cannot be expected to come from hot climates. For cultivation in the North, we should select the northern type of tree instead of the type from its southern limits. A tree native to low swampy lands of the far North cannot be expected to flourish on dry uplands of the western plains. Nature has provided trees for almost all conditions of temperature, moisture and soil. In our planting we should work with, rather than against, nature. The only rule is: Northern trees for northern planters (35).

The work of the plant breeder of the future must be more and more in the line of hybridizing of hardy types from mild and severe climates in order to combine the good qualities of both types. In hybridization lies much promise for the future. To the hybridization of hardy and tender plants we must look for important and valuable results in the coming years. Many millions of dollars would be saved in the planting of trees and shrubs so that results would come quickly. It is better to pay for plant improvement than to dig up dead plants.

List of Best Ornamental Shrubs for Special Purposes

Tall Shrub 15 to 20 Feet for Hedges and Windbreaks.
Caragana arborescens—Siberian Pea-tree.

Shrubs of Weeping Habit.
Caragana arborescens pendula, Carr—Weeping Pea-tree.

Tall Shrubs, Mostly for the Background, for Single Specimens for Hedges and for Low Windbreaks.
Many kinds of Lonicera or bush honeysuckle especially
Lonicera tataica—Tatarian Honeysuckle.
Lonicera tatarica—Semipalatinsk Bush Honeysuckle and Siberian Honeysuckle.

A Tall Native Shrub with White Flowers and Red Edible Berries.
Viburnum americanum—American Cranberrybush.

Tall Shrubs with White, Mostly Fragrant Flowers.
Many species of Philadelphus.

A Hardy Hedge that Will Endure Severe Trimming.
Caragana arborescens—Siberian Pea-tree.

Tall Shrub with Feathery Foliage.
Amorpha fruticosa.—Indigobush.

Native Shrub with White Flowers in Early Spring; Edible Berries.
Amelanchier alnifolia—Saskatoon.

Shrubs of Upright Habit, Mostly White Flowers; Many Valuable Species, Perhaps the Best of all Shrubs for Beginners.
Spiraea vanhouttei—Van Houtte Spirea.

Native Shrubs With White Flowers.
Physocarpus opulifolius—Common Ninebark.

Beautiful Shrub With Large White Flowers for Protected Places.
Hydrangea arborescens grandiflora—Snowhill Hydrangea.
Hydrangea paniculata grandiflora—Hydrangea Peegee.

Large Shrub or Tree with White Flowers, for Southern District.
Chionanthus virginica—White Fringetree.

Shrub with Yellow Flowers in Early Spring for Protected Places in Southern District.
Forsythia intermedia spectabilis—Showy Border Forsythia.

Early Leafing Native Currant with Pink Flowers and Red Fruit.
Ribes cereum—Wax Currant.

Shrubs with Mostly Blue or Lilac Colored Fragrant Flowers in Spring.
Syringa vulgaris—Common Lilac, attains a height of 25 feet and is hardy.

Handsome Black Hills Shrub with White Flowers, Red Berries and Feathery Leaves.
Sambucus pubens—Scarlet Elder.

An Upright Shrub with White Flowers and Large Bright Green Pinnate Leaves.
Sorbaria sorbifolia—Ural False-Spirea.

A Native Shrub, not Thorny, with Silvery Leaves and Red or Yellow Berries.
Shepherdia canadensis—Russet Buffaloberry.

Beautiful Native Shrub with Golden Yellow Fragrant Flowers and Smooth Leaves and Edible Black or Yellow Fruit.
Ribes aureum—Slender Golden Currant.
Ribes odoratum—Golden Currant.

Tall Spreading Shrub and White Flowers
Sambucus canadensis—American Elder.

Shade-enduring Shrubs.
Aronia arbutifolia—Red Chokeberry.
Corylus americana.—American Hazelnut.
Euonymus alatus—Winged Euonymus.
Ribes americanum—American Black Currant.

Shade-enduring Trailing Shrub with Red Berries, Excellent for North Side of House.
Lycium chinese—Chinese Matrimony-vine.

Lilac, Excellent as a Flower Hedge.
Syringa persica—Persian Lilac.

Late-blooming Lilac.
Syringa villosa—Late Lilac.

Very Tall, Late-blooming Lilacs.
Syringa amurensis—Manchurian Lilac.
Syringa japonica—Japanese Tree Lilac.

Tall Handsome Native Shrub with White Flowers and Blue-black Fruit and Glossy Leaves.
Viburnum lentago—Nannyberry.

A Native Shrub with White Flowers and Edible Fruit.
Viburnum venosum—Downy Viburnum.

Tall, Thorny Native Shrub with Silver Leaves and Red or Yel-low Edible Berries.
Shepherdia argentea—Silver Buffaloberry.

A New Rare Shrub with Thick Leaves and Very Fragrant Pink Flowers in Spring, for Protected Places in Southern District.
Viburnum Carlesi—Fragrant Viburnum.

A Good Native Late Blooming Shrub.
Spiraea alba—Meadow Spirea.

A New Late-blooming Shrub with Large Flowers.
Spiraea trichocarpa—Korean Spirea.

New Rare Shrub with Pink Flowers.
Kolkwitzia amabilis—Beauty Bush.

Native Ornamental Shrubs with Crimson Fruit and Four-angled Branches.
Euonymous atropurpureus—Wahoo.

A Native Shrub with Brilliant Red Feathery Foliage in Autumn and Scarlet Fruit.
Rhus glabra—Smooth Sumac.

Native Shrubs with Dull Red Stems for Color Effect in Winter.
Cornus stolonifera—Red-osier Dogwood.

Native Shrubs with Bright Red Stems for Color Effect in Winter.
Cornus alba siberica—Coral Dogwood.

Dwarf Native Shrub with White Flowers.
Physocarpus monogynus—Western Ninebark.

Dwarf Shrubs with Pink Flowers, Many of them Hybrids Originated Under Cultivation.
Spiraea Bumalda—Bumalda Spirea.
Spiraea Bumalda—Anthony Waterer.

Dwarf Willow for Ornamental Hedges and Snowcatchers.
Salix uralensis, Hort.—Ural Willow.

Native Dwarf Shrubs that Endure Severe Trimming. Excellent for Low Hedges; the Suckering Habit is an Objection.
Symphoricarpos occidentalis—Western Snowberry or Buck Brush.

Very Dwarf Shrubs with Red Foliage.
Berberis thunbergi minor, Rehder—Box Barberry.
Berberis thunbergi purpurea—Red-leaved Japanses Barberry.

Dwarf Black Hills Shrub with Edible Berries.
Mahonia repens—Creeping Hollygrape.

Dwarf Native Shrub with Red Berries Persisting Into Winter.
Symphoricarpos vulgaris—Coralberry.

Dwarf Shrub with Feathery Leaves and Yellow Flowers.
Caragana microphylla—Littleleaf Pea-Shrub.

Very Dwarf Shrub with Feathery Leaves and Yellow Flowers.
Caragana pygmaea—Dwarf Pea-shrub.

Dwarf Shrub for Hedges with Red Fruit.
Berberis thunbergi—Japanese Barberry.

Very Dwarf Shrubs.
Physocarpus opulifolius nana—Dwarf Ninebark.

Shrub of Very Dwarf Habit.
Caragana arborescens nana, Hort.

Very Dwarf Shrubs with Feathery Foliage and Yellow Flowers.
Caragana frutex—Russian Pea-shrub.

Low Shrub from the Black Hills.
Ceanothus fendleri—Fendler Ceanothus.
Ceanothus ovatus—Inland Jersey-tea.
Ceanothus velutinus—Velvety Ceanothus.

Shrub of Creeping Habit.
Ceanothus fendleri—Fendler Ceanothus.

Shrub of Creeping Habit and Shiny Dark Green Leaves.
Cotoneaster horizontalis—Rock Cotoneaster.

Rare Dwarf Shrub of Trailing Habit.
Lonicera spinosa alberti—Albert Honeysuckle.

Dwarf Shrub for Ground Cover Among Trees and Protected Places in Southern District.
Zanthoriza apiifolia—Yellowroot.

Trailing Shrubs for Rocky Slopes.
Arctostaphylos uva-ursi—Bearberry.

Dwarf Native Shrub with Three-lobed Leaves and Red Berries for Dry Slopes.
Rhus trilobata—Lemonade Sumac.

Dwarf Shrub, Earliest Bloomer, Flowers Pink.
Amygdalus nana—Russian Almond.

Dwarf Shrub with Dense Shiny Foliage, Excellent for Hedges.
Cotoneaster acutifolia—Peking Cotoneaster.

Dwarf Shrub for Hedge, Enduring Severe Trimming.
Ribes alpinum—Mountain Currant.

Dwarf Shrubs with Yellow Foliage.
Ribes alpinum aureum.

Dwarf Native Shrub with Yellow Flowers all Summer.
Potentilla fruticosa—Shrubby Cinquefoil.

Dwarf Shrub with White Flowers and Edible Fruit.

Prunus Besseyi—Bessey Cherry.

Dwarf Shrub with Purple-Red Leaves.

Prunus cistena—Purpleleaf Sandcherry.

Low Shrubs with White Flowers for Sheltered Situations in Southern District.

Deutzia gracilis—Slender Deutzia.
Deutzia scabra—Fuzzy Deutzia.
Deutzia scabra plena—Double Rose Deutzia.

Dwarf Black Hills Shrub with White Berries Persisting Into Winter.

Symphoricarpos pauciflorus—Dwarf Snowberry.
Symphoricarpos racemosus—Common Snowberry.

Shrubs with Double Pink Flowers in Early Spring for Southern District.

Prunus glandulosa—Flowering Almond.

Shrubs with White Variegated Foliage.

Cornus alba var. argenteo-marginata—Silveredge Dogwood.

Shrubs with Gray Foliage.

Amorpha canescens—Leadplant.
Elaeagnus augustifolia—Russian-olive.
Elaeagnus argentea—Silverberry.
Hippophae rhamnoides—Sea-buckthorn.
Tamarix Amurensis—Amur Tamarix.
Artemesia—various species.

Shrubs with Blue-Green Foliage.

Lonicera korolkowi—Blueleaf Honeysuckle.

Shrubs with Yellow Foliage.

Sambucus canadensis aurea—Golden American Elder.
Caragana arborescens cucullata, Hort.
Physocarpus opulifolius luteus—Goldenleaf Ninebark.

Shrubs with Red Foliage.

Berberis thunbergi var. purpurea—Purple Japanese Barberry.
Prunus Cistena—Purpleleaf Sandcherry.
Rosa rubrifolia—Redleaf Rose.

A Climbing Vine of Very Dwarf Shrub With Shiny Leaves in Threes and Small White Berries in Clusters Persisting Into Winter.

Rhus toxicodendron.—Poison Ivy. Highly poisonous to the touch. It should be distinguished sharply from the Virginia Creeper and the Engelmann Creeper which have leaves in fives.

Native Climbing Vine with Fruits Valuable for Culinary Purposes.

Vitis Vulpina—Riverbank Grape.

A Strong-growing Vine with Long Lilac-colored Flowers with Long Hanging Racemes. This is One of the Glories of Japan, not Sufficiently Hardy in the North. For Sheltered Places, Southern District Only

Wisteria sinensis—Chinese Wisteria.

A Choice Climbing Vine with Scarlet Trumpet-shaped Flowers and Red Berries. Blooms all Summer.

Daphne Cneorum—Rose Daphne.

Hardy Native Climbing Vine for Arbors and Trellis.

Ampelopsis quinquefolia—Virginia Creeper.

A Self-climbing Vine for Walls.

Ampelopsis quinquefolia engelmanni—Engelmann Creeper.

A Strong Climber with Large Leaves and Flowers.

Aristolochia sipho—Dutchmans-pipe.

Climbing Vines with Large Red Flowers for Southern District.

Bignonia grandiflora—Chinese Trumpetcreeper.
Bignonia radicans—Trumpetcreeper.

Native Climbing Vine with Highly Ornamental Red and Orange Fruit.

Celastrus scandens—American Bittersweet. In danger of extinction because it is picked too freely.

A Climbing Vine with Large Purple Flowers for Sheltered Places.

Clematis jackmani—Jackman Clematis.

Climbing Native Vines with White Flowers.

Clematis ligusticifolia—Western Virgins-Bower.
Clematis virginiana—Virgins-Bower.

A Climbing Vine with Thick Evergreen Leaves and Orange and Scarlet Berries for Southern District.

Euonymus radicans vegetus—Bigleaf Wahoo.

A Native Climbing Vine with Greenish-Yellow Bark, Double Red Flowers, and Bluish-Black Fruit.

Menispermum canadense—Common Moonseed.

Dwarf Trailing Vine for Shady Places in Southern District.

Menispermum dauricum—Asiatic Moonseed.

Descriptive List of Shrubs

Acanthopanax sessiliflorum

Acanthopanax sessiliflorum, Rupr. & Maxim.
Acanthopanax sessiliflorum, Rupr. & Maxim. Panax sessiliflorum, Ruprecht & Maxim. Panax sessiliflorus, Seem.

Native of Manchuria, North China, Korea and Japan. Forms a large shrub about 12 feet in height and width. The branches are stout; flowers small and dull purplish, in round dense heads on short stalks at the end of the branches. The young wood when bruised has a rank odor. The stout branches have numerous thorns on the two-year old wood but tend to disappear on the older wood. The leaves have three, sometimes five leaflets. The shrub makes a handsome pyramid of foliage. The flowers have no beauty but the black fruits are ornamental. This shrub bore considerable fruit but the branches kill back too much to make the shrub of value.

The Juneberries

Amelanchier.

A genus of shrubs and small trees of 20 or 25 species, in Europe and Asia but chiefly in North America. They are all very desirable ornamentals, distinguished by either pure white flowers which appear in great abundance early in spring. The leaves assume an attractive red or yellow coloring in autumn. The species are closely related with numerous spontaneous hybrids. making it difficult to distinguish them.

"The native Juneberries, species of Amelanchier, with their woolly leaves and white flowers in early spring are worth having. Our native species grow to be eight or ten feet high, but there are other species that become fair sized trees." Trees for Park Planting, by L. R. Moyer (18).

Saskatoon

Amelanchier alnifolia.
Amelanchier alnifolia, Nuttall.

A choice large ornamental shrub of special value for the white blossoms in early spring. Native from Michigan to the Pacific coast and north to the valley of the Yukon river. Saskatoon is the Indian name and is now generally adopted instead of Juneberry, Shadbush, or Sugarberry. Suscutan is another spelling of the Indian name.

"A medium sized shrub with broadly ovate or rounded leaves which are coarsely toothed toward the apex; white flowers, and purple, berry-like, edible fruit. Much cultivated both for the fruit and as an ornamental. Common throughout the State." Thomas A. Williams (28).

"In thickets and on dry knolls from the James valley westward; common." D. A. Saunders (26).

"We have secured this shrub from various parts of the Dakotas and Manitoba for use in plant-breeding. The neat handsome foliage and abundant white blossoms in early May followed by the purple berries make it a desirable lawn shrub. The fruit is prized for table and culinary use. The birds are very fond of the fruit and will take all the berries as fast as they

ripen, if only a few plants are set, but in a large plantation the birds' share will probably not be missed. I find that scions from selected bushes can be readily grafted on apple roots." N. E. Hansen (9).

"Along the Missouri river and westward in the state. Shrub sometimes ten feet high. The fruit of all the service berries is edible and in some seasons used extensively." W. H. Over (19).

"Low dwarf stoloniferous plants with oblong or oval blunt leaves, small flowers, short correspondingly broad petals, and juicy, dark purple fruit are in cultivation under this name and the English name Dwarf Juneberry. The origin and identity of these forms have not been established. They may represent more than one species." L. H. Bailey (3).

Amelanchier alnifolia, Saskatoon-berry or Northwestern Juneberry.—"A shrub 6 to 8 feet high which when young is tomentose pubescent and later is glabrate throughout. The broadly elliptic leaves are thick, very obtuse at apex, rounded at base, one-half to 2 inches long and coarsely dentate above the middle. The keenly fragrant flowers on short pedicels are in short dense racemes. The globose pome is purple and mantled with a bloom. It is one-fourth to one-third inch in diameter and has a high sweet flavor.

"The Saskatoon-berry frequently chooses dry soil but is often a conspicuous shrub in river flats. It grows at least as far north as Grass river —Township 79.

"The berries are gathered and dried in large quantities by the Indians. They serve much the same purpose in the prairie household as does the blueberry in Western homes viz: pies, preserves, wine, jam and in combination with rhubarb or other berries.

"A. alnifolia responds to good soil and cultivation. The aim will be to get varieties with great productiveness combined with larger sized fruits. It is the hardiest fruit tree in the West and undoubtedly it is capable of vast improvement." "Native Fruits of Manitoba" by W. R. Leslie (17).

Garden Shadblow

Amelanchier ovalis.
Amelanchier ovalis, Borkh. Amelanchier spicata, Koch.

According to Bailey, it is possibly a hybrid between **Amelanchier stolonifera** and **Amelanchier longifolia**. Much cultivated in Europe. A tall upright bush with numerous stolons, with age developing into a mass of upright limbs close together. Hardy at this station.

Amelanchier rotundifolia (Michx.) Roem.—Round-leaved Juneberry. "In woods and thickets in the Minnesota and Sioux valleys." A. D. Saunders (26).

Amelanchier ovalis, Borkh.—"This is the same as **Amelanchier rotundifolia,** Roem, native from New Brunswick to Minnesota. A hardy bush with white blossoms in early May. The small blue-black berries are taken by the birds." N. E. Hansen (9).

Amelanchier rotundifolia.—"A smaller shrub than **Amelanchier canadensis,** but found in about the same range." W. H. Over (19).

Noted at Long Cannon Hills west of Sisseton north slope and at Big Stone lake, Roberts county by L. H. Pammel, 1917.

Indigobush

Amorpha fruticosa.
Amorpha fruticosa Linn. Amorpha fragrans, Sweet.

The Indigobush or False-Indigo is an ornamental shrub, 5 to 20 feet high, with feathery foliage. Native from Connecticut to Minnesota, south to Louisiana. The leaves are pinnate or feathery, with 15 to 33 leaflets. The small flowers are one-third inch long, blue with purple anthers, densely packed in slender racemes. The tall stems make it better adapted to the background in shrub groups. Many varieties of the Indigobush have been developed under cultivation, especially in Europe. The foliage is highly ornamental. It is an excellent plant for rough slopes and situations where it can be left undisturbed. I have observed interesting clumps of Indigobush on the shores of Lake Kampeska and Big Stone lake.

"A medium sized, smooth shrub growing along banks of streams. A beautiful plant well worthy of cultivation. Found all over the state, but perhaps more plentifully east of the Missouri." Thomas A. Williams (28).

"Bordering streams and lakes throughout the state." D. A. Saunders (26).

Dwarf-indigo

Amorpha microphylla.
Amorpha microphylla, Pursh. Amorpha nana, Nuttall.

The Dwarf-indigo, also called Dwarf-false-indigo, is a native from Manitoba and Saskatchewan to New Mexico. It is a low shrub, about 3 feet high, leaves pinnate, with 8 to 13 pairs of leaflets and an odd one. Flowers are fragrant, in short, cylindrical terminal racemes. It resembles Amorpha canescens but has little or none of the gray down and the flower spikes are not clustered. It is a dainty plant that merits more attention.

"This is a low bushy shrub, not more than three feet high, with compound leaves of thirteen to nineteen tiny, bright green leaflets and a terminal solitary spike of brilliant fragrant flowers, each with its purple banner and its golden stamens." Harriet L. Keeler, in "Our Northern Shrubs" (31).

"A low, smoothish shrub, common west of the Missouri." Thomas A. Williams (28).

"On banks and prairies from the James valley westward to the Black Hills; also reported from Sioux Falls in the Sioux valley; more abundant from the Missouri river westward." D. A. Saunders (26).

Leadplant

Amorpha canescens.
Amorpha canescens, Nutt.

A low shrub 1 to 3 feet high, with densely white pubescent, leathery leaves, 2 to 3 inches long. Flowers blue, with brilliant orange anthers, in clustered spikes, from late July to September. An interesting plant well suited for low shrub in front of other shrubs. Native from Michigan and Saskatchewan to Texas and New Mexico. It varies in the gray-white tints of the stems and leaves and in the size and openness of the clustered flower spikes. The name Leadplant was founded on the belief once prevalent that its existence indicated the presence of lead ore in the soil. It is

often called Shoe-string in the western states. The Leadplant thrives in dry and even very sandy soils.

"A low, white-hairy shrub with purple flowers in spikes and long, tough roots. Dry soils throughout." Thomas A. Williams 28.

"Very abundant on prairies throughout the state." A. A. Saunders (26).

Russian Almond

Amygdalus nana.

Amygdalus nana, Linnaeus. Prunus nana, Stokes.

"**Prunus nana**, Stokes. (Amygdalus nana, Linn.) Siberian Almond, Native of lower Austria, eastward through central and southern Russia, the Caucasus, Siberia, Dahuria and Sungaria. A low bush 3 feet in height, of neat, compact habit. The abundant pink blossoms nearly an inch across appear very early, this year by the first of May. A very hardy, choice and desirable dwarf shrub. Our plants were obtained in St. Petersburg, Russia, for the United States Department of Agriculture (S. P. I. No. 236) and are fruiting this year. In time we hope to produce a desirable almond from this species. At present the plant is of value only as an ornamental shrub." N. E. Hansen (9).

No. 236 is listed in "Inventory No. 1 Foreign Seeds and Plants Imported by the United States Department of Agriculture" as follows: "**Prunus nana.** From Russia. Received through Professor N. E. Hansen, December, 1897. Native of Siberian steppes. Did not survive at the Oregon station; is doing well at the South Dakota station."

Amygdalus nana is a low deciduous bush 3 to 5 feet high; leaves lanceolate or oblong, sharply saw-toothed; flowers rosy red; fruit of variable size, about 1 inch long, covered with the velvety down. Since this species **Prunus nana** is widely distributed it is necessary to distinguish sharply the geographical variety known as the Siberian Almond. This would naturally be much hardier than the form coming from the Caucasus where **Vitis Vinifera** grapes are both native and cultivated. By the Siberian Almond is meant the one introduced by the writer and described as follows, in South Dakota Bulletin 224:

Siberian Almond

"Introduced 1916. **Amygdalus nana L.** A beautiful lawn shrub destined to great popularity. All visitors to the college grounds in early spring are attracted by the remarkable color display of this beautiful shrub, which should be planted in every garden in the Northwest and far north into Canada. A dwarf ornamental with abundant, bright rose pink flowers, the very first of all shrubs to bloom in the spring. Splendid to plant in front of other shrubs on the lawn. Brought from the dry steppes of the Semipalatinsk region of Siberia, where the temperature ranges from 50 degrees below zero in winter to 106 degrees above in summer, and only eight inches of total annual rainfall, including snow."

"Siberian Almond is rather a dwarf ornamental but has its place. This is also one of Professor Hansen's finds and I think a great deal of it, as it is the first ornamental to blossom in the spring and even if the pinkish-red blossoms are short-lived, it is, like the early crocus, always welcome

because they brave the elements and are the harbingers of better things to follow."—"New Ornamentals" by J. B. Taylor, Ipswich, South Dakota; Annual Report of South Dakota State Horticultural Society, 1920, page 27.

Devils-Walkingstick

Aralia spinosa.

Aralia spinosa, Linn.

Order **Araliaceæ.** Also called Hercules' Club and Angelica Tree. Native of southern Pennsylvania to eastern Iowa, south to Florida and eastern Texas; a large shrub or small tree with very spiny branches. In summer the stout stems and large leaves give the plant a subtropical appearance. Of unique appearance in winter owing to the stout club-like prickly stems which are grotesque if not beautiful.

"A very attractive small tree or shrub, about 10 feet, with immense leaves, finely divided. Flowers, in large white bunches, followed by a mass of dark purple berries. Tropical in appearance. In this locality they usually die back to the ground in the winter, coming up each spring and making a good strong growth. We do not figure this a drawback on account of their rapid growth." D. B. Gurney, Yankton, 1929.

Red Chokeberry

Aronia arbutifolia.

Aronia arbutifolia Spach. Sorbus arbutifolia, Heynh. Pyrus arbutifolia, Linn. f. A. arbutifolia, Ell. A. pyrifolia, Pers. Mespilus arbutifolia var. erythrocarpa, Michx.

An upright shrub, 6 to 10 feet high, native from New York to Minnesota, south to Florida and Louisiana. Grown for their attractive white flowers, ornamental and bright autumnal coloring of the foliage. Does best in sheltered places.

"White flowers followed by holly-like berries beautiful fall color. Endures shade. Medium." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Bearberry

Arctostaphylos uva-ursi.

Arctostaphylos uva-ursi, Linn.

Bearberry is a circumpolar species, being native around the world at the north; in North America, south to Mexico. A valuable shrub for covering rocky slopes and sandy banks.

Arctostaphylos, a literal translation of Bearberry, is from the Greek **arctos,** bear, and **staphyle,** a bunch of grapes.

"A pretty trailing shrub with oblong-spatulate, evergreen leaves and bright red berries. The leaves are of medicinal value. Abundant in the Black Hills." Thomas A. Williams (28).

"On dry knolls in the Black Hills, and in the adjacent plains; Custer, and the Bad Lands." D. A. Saunders (26).

Black Chokecherry

Aronia melanocarpa.

Aronia melanocarpa, Elliott. Pyrus nigra, Sargent. Aronia nigra, Dippel, Sorbus melanocarpa, Heynh. Pyrus melanocarpa, Willd.

"**Pyrus nigra, Sargent.**—Native of North America, from Canada south to Florida, westward to Montana, Minnesota and Illinois. Dippel refers

this to **Aronia nigra,** Dipple. A hardy low spreading bush, 2½ feet in height, of neat habit and with obovate to oval somewhat glossy leaves. A promising ornamental shrub." N. E. Hansen (9).

A very free bloomer; flowers, white; fruit, black. "Melanocarpa" means dark-fruited. In planting this handsome ornamental shrub, care should be taken to plant the northwestern form of the species. In Minnesota the Black Chokeberry is native "in swamps and low ground, rather common in the eastern part of the state from Olmsted county northward. Nova Scotia to western Ontario, south to Florida and Minnesota." Trees and Shrubs of Minnesota, Rosendahl and Butters (23).

Southernwood

Artemisia abrotanum.
Artemisia abrotanum, Linn.

There are about 200 species of **Artemisia** mostly in the northern Hemisphere. Order **Compositæ.** Southernwood or Old Man, native of southern Europe, is a soft-wooded shrub. Artemisia is a large genus of the Compositae, abundant in Europe and especially in the dry regions of North America, where they cover large areas and are known as Sagebrush. Most of them have foliage of a grayish tinge, with a strong, often agreeable odor.

"This is the common Old Man or Southernwood, and forms a very dense mass of finely cut foliage three to four feet in height. This bush is grown for its aromatic scented leaves; the branches kill back every winter, but sprout vigorously in the spring." N. E. Hansen (9).

Low Sagebrush

Artemisia cana, Pursh.

Native from Nebraska to Colorado, North Dakota and Saskatchewan. In South Dakota: "On the dry plains from the Missouri valley westward." D. A. Saunders (26).

Silvery Wormwood

Artemisia filifolia, Torr.

"A low branched, half-woody, whitish plant with very slender leaves. Not uncommon in the western half of the state." Thomas A. Williams (28).

"In the Bad Lands country just east of the Black Hills." D. A. Saunders (26).

Russian Artemisia

A strong growing bush from 6 to 8 feet in height. Tested as a low hedge to catch the snow on the dry lands in the Dakotas and Saskatchewan.

"The branches kill back every winter below the long, loose panicles of dull yellowish green very homely flowers. The flower heads should be removed as soon as they appear and the hedge trimmed to uniform height. This will keep the hedge green later in the fall and make it more dense. Cutting the hedge to the ground about every third spring also serves to thicken it. On land too dry for more valuable plants this may serve a use-

ful purpose as a cheap temporary screen, but most people will find the necessary trimming too troublesome and will prefer more permanent and valuable hedges." N. E. Hansen (9).

"Old Man or Russian Artemisia. One of our very hardiest and quickest growing hedge plants. Will make a 4-foot hedge in a month or two. Semi-herbaceous and kills back part way over winter, but the new growth comes faster and stronger each year. Feathery branches covered with grayish green foliage and emitting a pleasant pungent odor." George F. Will, Bismarck, North Dakota, 1930.

"A strong growing variety is the Russian Artemisia, 6 to 8 feet, which was introduced many years ago. If kept trimmed closely it makes a neat appearance but not if left untrimmed. Brother Bernard Hinderhofer of the St. Francis Mission in the Rosebud Reservation at St. Francis, South Dakota, writes (June 28, 1923): "About 18 years ago I received through your kindness some Russian Artemisia, "Old Man." These have been thriving from the beginning and I have given some to hundreds of families in the neighborhood."

"The Russian Artemisia may be Artemisia Abrotanum tobolskianum (Tobolskianum) mentioned in Nicholson's Directory of Gardening. This is a much more vigorous variety than the typical Old Man.

Wormwood

Artemisia procera, Willdenow.

Native of southern Europe and Asia Minor, the Caucasus and Siberia. A bush of very dense habit, similar to the common Southernwood but of somewhat stronger growth. Bush killed back considerably.

Sagebrush

Artemisia tridentata.
Artemisia tridentata, Nuttall.

Native from Nebraska and Montana to the Pacific coast.

"A much-branched shrub with wedge-shaped, usually three-toothed leaves. The largest of the sage brushes, said to occur in the extreme western part of the state." Thomas A. Williams (28).

A shrub of open habit from 1 to 12 feet in height. Found also on dry alkaline areas. The young shoots and leaves are covered with a dense silvery gray felt. Where there are hundreds of acres covered with sagebrush the effect is monotonous, but a plant or two in a garden is interesting. Sagebrush has found favor in the gardens of England where it was introduced in 1895.

"When rubbed, the plant emits a strong but pleasant odor, which moisture of itself appears to release, for after a shower, or still more after a wet day, the air for several yards around a group of plants is filled with this aromatic scent. The species is usually a great favorite with those who cultivate it on this account. * * * In our gardens it makes a very pleasing feature not only for its fragrance, but also for the silvery gray foliage, which provides an agreeable contrast to ordinary green shrubs." W. J. Bean (5).

Azalea

The cultivated Azealeas winter-kill in the Northwest and are not in the catalogs of northern nurseries. Botanically the Azeleas are now classified under Rhododendrons. About 350 species of Rhododendrons are known in the colder and temperate regions of the Northern hemisphere and extend into tropical Asia; 16 species are native of North America. They are highly ornamental plants grown for their beautiful flowers and foliage. As far as tested no Azalea is adapted to the prairie soil as it needs moist peaty soils free from lime.

Swamp Azalea

Azalea viscosa.
Rhododendron viscosa. Rhododendron viscosum, Torr. Azalea viscosa, Linnaeus.

Native in swamps from Maine to South Carolina. One of the most delightful of garden shrubs and the reputed parent of a great number of garden azaleas. Winter-killed at this station.

Japanese Barberry

Berberis thunbergi.
Berberis thunbergi, De Candolle.

One of the most valuable of all the Barberries for ornamental planting; of very close compact habit, has large brilliant red fruit which remains through the winter, and brilliant red foliage in autumn. It endures severe trimming, making a low dense hedge. Useful for the borders of walks and for single specimens. Also endures some shade. This barberry does not harbor the wheat rust. Native of Japan. The Japanese Barberry is easily distinguished by the thorns which are about one-half inch long, nearly always single, but sometimes 3-pronged. The Common Barberry, which harbors wheat rust, has 3-parted spines, sometimes five or more.

"Native of Japan. Of 4 plants from the Arnold Arboretum, 3 winter-killed, one is alive, 1 foot in height and now doing well. We have tested a large number of plants of this Japanese barberry as imported by Prof. Budd and our own importation from Germany. Many of the plants winter-kill when young when given no protection, but the survivors do better with age. Its low, very dense habit, attractive red fruit and scarlet fall coloring of leaves, make it worthy of trial for dwarf hedges and borders for walks and drives in the southern part of the state but it cannot be recommended as perfectly hardy." N. E. Hansen (9).

"Perfectly hardy, will make a dense hedge from 3 to 4 feet high that will always remain symmetrical without pruning. However, it may be pruned to almost any form. It bears large nearly round crimson berries which remain on nearly all winter. The foliage colors beautifully in autumn. It is perfectly safe to plant this barberry as it has no connection with the rust that affects other barberry and the grain. It is an excellent ornamental plant, and extensively used. Plant 16 to 20 inches apart." D. B. Gurney, Yankton, 1929.

"The Japan Barberry (Berberis **thunbergii)** is a low growing and rather spreading shrub well adapted to the foreground of plantings. It is

excellent for masking the foundations of buildings. Its leaves and fruit are very bright in autumn." L. R. Moyer, Montevideo, Minnesota (18).

There are several horticultural varieties of Japanese Barberry. A variety imported from Russia in 1906 under the name:

Berberis thunbergi folies variegata, with white-variegated leaves, is of about the same degree of hardiness at the green-leaved type. It does not seem to be in propagation in American nurseries.

There is a variety with the leaves variegated with white, the Silver Beauty, **Berberis thunbergi argenteo-marginata,** Schneid, which originated in Franklin, Massachusetts.

Two recent novelties which are being tested at various places in the state are:

Berberis thunbergi purpurea, the red-leaved Japanese Barberry; a very attractive plant, making a glowing red mass of foliage.

Berberis thunbergi minor, Rehder, the Box Barberry, is a very dwarf variety used for hedges.

Rayless Goldenrod

Bigelovia douglasi, Gray.

A low shrub 3 feet in height. Native from Wyoming to Arizona.

"Rayless Goldenrod **(Bigelovia douglasi,** Gray). Somewhat like the preceding **(Bigelovia graveolens)** but larger, with hairs wanting and with the stem green and often resinous-viscid. Common along the Cheyenne river." Thomas A. Williams (28).

Bigelovia graveolens, Gray.

The genus **Bigelovia** belongs to the Composite family and includes more than 30 species of North American herbs and low shrubs. The genus is very closely related to the Goldenrods. This extremely variable species is native from Montana to New Mexico; a much-branched shrub from 1 to 4½ feet in height, of aromatic odor when bruised.

"Rayless Goldenrod **(Bigelovia graveolens,** Gray). A low shrubby branched plant with narrow, cottony-hairy (at least while young) leaves and yellow goldenrod-like flowers in which the rays are wanting. Bluffs along the Missouri and to the westward. Several forms occur." Thomas A. Williams (28).

"Chrysothamus graveolens, Green; **Bigelovia graveolens,** Greene. Conspicuous in bloom with its large corymbs of golden-yellow flowers; suited for well drained sunny positions. It contains rubber, though not in sufficient quantity for commercial exploitation." Alfred Rehder, 1927 (22).

Orange-eye Butterflybush

Buddleia davidi.

Buddleia davidii, Franch. **Buddleia variabilis,** Hemsl.

There are about 70 species of **Buddleia,** shrubs or trees, in tropical and temperate South America, Asia and South Africa; none of them hardy North. A few will survive and bloom if protected at roots with dry leaves. Some are grown in greenhouses in winter.

Buddleia is sometimes, but inappropriately, called Summer Lilac. The flowers are small lilac white or yellow in showy panicles or clusters.

Buddleia davidi is a native of China and bears lilac flowers with orange-yellow mouth. Winter-killed at this station. When planted it should be grown as a perennial, with good winter protection and with the expectation that the tops will die and that the roots will send up new sprouts each spring.

This species is "native of central and west China up to 9000 feet; first discovered near Ichang by Professor Henry, about 1887 and originally introduced by way of St. Petersburg." W. J. Bean, in "Trees and Shrubs Hardy in The British Isles."

Ichang is in latitude 35 degrees. Many seedlings superior to the original type have been grown in recent years.

Oxeye Butterflybush

Buddleia Davidii, Franch, var. **magnifica,** Rehder & Wilson.
Buddleia variabilis var. magnifica, Wilson.

A horticultural variety with "larger deep rose-purple flowers in very dense spikes, with deep orange eye and the margins of the corolla-lobes reflexed." Alfred Rehder, "Manual of Cultivated Trees and Shrubs" (22).

"**Buddleia Magnifica** has come through the season nicely here with heavy protection. In the open, it has winter-killed. We have not tried other varieties." George W. Gurney, Yankton, 1929. "This shrub, from a young plant, set out either in the spring or fall, will mature to full size the first summer, producing a handsome bush which often attains a height of four feet the first year. It produces long, graceful stems, which terminate in tapering panicles of beautiful lilac-colored flowers that are of miniature size and borne by the hundreds on a flower head which is frequently 10 inches long. A single plant the first season will throw out as many as 50 flower spikes." D. B. Gurney, Yankton, 1929.

Common Sweetshrub

Calycanthus floridus.
Calycanthus floridus, Linn.

Order **Calycantheceæ.** Also called Sweet-scented Shrub or Carolina Allspice. A shrub native from Virginia to Florida. Cultivated for the remarkable sweet fragrance of the reddish-chocolate-brown flowers. This fragrance is also found in the wood and roots. The three plants tested at this station all winter-killed.

Siberian Pea-tree

Caragana arborescens.
Caragana arborescens, Lamarck.

Order **Leguminosæ.**—There are more than 50 species of Caragana distinguished from the Causasus east to China and Siberia; most of them in Central Asia. Most of the species are more or less spiny. They are ornamental shrubs grown for their bright yellow flowers. Some are useful for hedges. Under cultivation the plants are much less spiny than in the wild state. In Siberian market places I have seen **Caragana** brooms offered for sale, the young shoots being used for this purpose. There are a number of cultivated varieties of **Caragana arborescens.**

Caragana is the best plant for hedges, low windbreaks and snow-catchers for the entire prairie Northwest, extending far north into Canada, Manitoba, Saskatchewan, and Alberta. It is recognized by the Canadian Government as the best hedge plant for the most exposed situations on the prairies. **Caragana arborescens** is the full name, the term **"arborescens"** referring to the tree-like habit of the plant. It is not really a tree but a tall shrub which retains its limbs from the ground up and reaches a height of about 20 feet. In 1897, as Agricultural Explorer for the United States Department of Agriculture, Washington, D. C., I imported about three hundred and fifty pounds of **Caragana arborescens** seed from Russia. This was not the first importation but perhaps the largest ever made. At any rate this seed served a good purpose in introducing the plant very extensively.

"Native of Siberia and Manchuria. A valuable hardy shrub for ornamental hedges and the lawn. A large, somewhat thorny bush or small tree, attaining a height in its native home of 15 to 20 feet. Throughout European Russia it is a favorite ornamental hedge plant for the home grounds. In government forestry plantations on the Russian steppes it is used as a nurse tree, or rather, bush, because it endures severe drought. The maximum height of the untrimmed Caragana hedges I observed in Russia was 15 to 20 feet, but the usual height of trimmed hedges was about one-third of this. The German name "tree-like pea bush" defines the size better than the English name "pea-tree." The name refers to the blossoms which are like those of the pea; th color, however, is yellow. It is a member of the same family, **Leguminosæ**. In May the bush is covered with a profusion of blossoms. The locust-like foliage appears early and is of a lively green color. This handsome shrub has proved hardy in Minnesota, the Dakotas, Manitoba and Assinaboia. During 1899 and 1900 a large number of plants of this species were sent out by this station for trial throughout the state, especially the northern half. The seed was imported by the United States Department of Agriculture and secured by the writer in Russia in 1897. None of these plants remains except one sample hedge, and the further work of propagation must be done by nurserymen. Many plants of this species are found among the Russian Germans in the Dakotas, grown from seed brought from Russia. The only insect enemy observed so far is the gray or black blister beetle, but so far as we have noticed the ravages are confined to the new leaves and these usually send out a new crop of leaves as soon as the insects disappear." N. E. Hansen (9).

Caragana plants should be set about two feet apart. They will endure severe trimming but several buds must be left at the base of the young shoots to encourage the growth for the next year. When the time comes to cut back the hedge far into the old wood, this should be done when the plants are dormant in late fall or winter. For single specimens on the lawn the Caragana should be found on every lawn, owing to its beautiful green foliage, beautiful feathery leaves much like a locust and the wealth of abundant yellow blossoms. The tree does not do well farther south where the summer heat is extreme. Caragana in North Dakota:

"This is one of the best, if not the very best shrub to withstand drought, cold, and alkali. It is not a tree to be used for shade but as a hedge, snow trap or outside row for shelter belts it is supreme. Its extreme height will

not exceet 25 feet hence it will not grow away from the ground like the willow. The best protected garden I know of on the plains is surrounded by an unpruned hedge of this plant. As a clipped hedge for city planting or as a shrub for the lawn it is very desirable. The bright green foliage is attractive all summer, the yellow blossoms add to its attractiveness in the spring, and during the winter its stems do not present so rough an appearance as many shrubs." Professor A. F. Yeager, Agricultural College, Fargo, North Dakota

Caragana in Saskatchewan.—"Without doubt the **Caragana Arborescens** is one of the most generally useful plants for hedge purposes and low windbreaks than can be used on the prairies. So far as I know this shrub was first introduced into western Canada by the Mennonites who settled in Manitoba in the early eighties. It is hardy in every section of the prairie regions.

There is nothing which can beat the Caragana for a hedge or low windbreak to protect vegetable gardens. It is particularly useful as a trimmed hedge and can be kept at any height from four feet up. We believe that the Caragana will in the very near future be used very extensively for windbreaks to counteract soil drifting. For such purposes we believe it is well adapted as it is not easily injured by stock but will withstand probably more neglect than most other broadleafed varieties and if given a fair show it will reach a very considerable height, namely, 15 to 20 feet, and if cut back once or twice while young will make a very thick, dense growth. Caragana is also useful as ornamental specimens." Norman M. Ross, Chief of Tree Planting Division, Government Nursery Station, Indian Head, Saskatchewan.

"The Siberian Pea-tree, **Caragana arborescens**, is now pretty well known. It is very showy in the spring producing yellow flowers and bright green leaves. There is a dwarf variety, **Caragana pygmæ**, a low growing species, and **Caragana frutescens** are not so well known. The latter makes a fine screen. They are at their best in April and early in May before many other things have started." L. R. Moyer, Montevideo, Minnesota (18).

"**Caragana** or Siberian Pea-tree, has a yellow pea-shaped blossom followed by a brown pod. Has a delicate, fine locust-like foliage and is one of our most useful shrubs as it makes one of the best outside rows for a windbreak." J. B. Taylor, Ipswich, South Dakota, 1917.

Caragana arborescens cucullata, Hort.—"A low dwarf bush of compact habit with leaves somewhat curled; of no special value except as an oddity." N. E. Hansen (9).

Caragana arborescens lutescens, Hort.—"Present height 7 feet; of hardy, strong upright growth. The yellowish cast of the foliage early in the spring gives the bush a very distinct expression; this color changes to green later in the season." N. E. Hansen (9).

Caragana arborescens nana, Hort.

"A very curious dwarf bush 20 to 30 inches in height, of very dense, compact habit. A curiosity only." N. E. Hansen (9).

This was grafted on the type **Caragana arborescens.**

Weeping Pea-tree

Caragana arborescens pendula, Carr.

This interesting variety with stiffly pendulous branches is grafted high on tall stocks of **Caragana arborescens.** Hardy at Brookings.

Caragana arborescens fol. variegatis, Hort.

A variety with white variegated leaves.

"A hardy bush of dense, strong growth. In bloom the last half of May. No variegation observable, at least when the leaves are fully expanded." N. E. Hansen (9).

Caragana aurantiaca, Koehne

Caragana arenaria, Dieck.

Caragana pygmaea aurantiaca erecta, Dieck, Hort.

Very similar to **Caragana pygmaea,** of which when first intriduced it was regarded merely as a deeper colored (orange-yellow) form. Native of Siberia south to Afghanistan and Turkestan.

"This and **Caragana pygmaea** are probably the prettiest of all Caraganas. Its habit is graceful, and it blossoms with great profusion, the flowers hanging thickly from the under-side of the branch in a long row, three or four to the inch. It blossoms in May and June, and can be easily propagated by late summer cuttings." W. J. Bean (5).

"**Caragana pygmaea aurantiaca erecta, Dick.**—Sand Pea Bush. This is referred to **Caragana arenaria** by Dippel and to **Caragana aurantiaca** by Koehne. Probably a native of west central Asia especially the Thianschan mountains. A low open bush now three feet in height with gray green sparse foliage. The very abundant reddish yellow blossoms appear in late May and early June. Hardy and very distinct." N. E. Hansen (9).

Mongolian Pea-shrub

Caragana chamlagu.

Caragana chamlagu, Lamarck.

A rounded bushy shrub up to 4 feet in height with large dark green leaves. The bruised bark smells like licorice.

"**Caragana chamlagu, Lam.** Chinese pea bush. Native of north China. A bush now two and one-half feet in height; branches killed back about one-half. Flowers reddish yellow, appearing the first half of June. Our specimens were grafted on **Caragana arborescens** roots and a large lump has formed beleath the surface at point of union." N. E. Hansen (9).

Caragana cuneifolia, Dipp.—"Cuneifolia" refers to the wedge-shaped leaves.

"Probably from Mongolia and Dahuria. Height now nine feet, of clean upright habit and strong growth. A fine bloomer the latter half of May. Perfectly hardy. Apparently a form of **Caragana arborescens.**" N. E. Hansen (9).

Caragana frutescens acutifolia, Hort.—"A bush now 2½ feet in height with dark green leaves and a few dead shoots. Our two specimens are grafted on **Caragana arborescens** stock and a large lump has formed at the point of union below the surface, showing the lack of affinity between the two species." N. E. Hansen (9).

Caragana frutescens grandiflora, Hort.—"A hardy bush now 4 feet in height with dark green foliage. Flowers large but not abundant, appearing the latter half of May." N. E. Hansen (9).

"**Grandiflora**" means large-flowered. This variety has flowers over 1 inch long.

Caragana frutescens latifolia, Hort.—"A broad-leaved variety. Our two specimens are 3 feet high and grafted on **Caragana arborescens** stock. The union appears uncongenial, one specimen being dead and the other showing dead stoots." N. E. Hansen (9).

Caragana frutescens obtusifolia, Hort.—"Present height 4 feet. Blossoms not abundant, but large and choice. A hardy bush with dark green leaves." N. E. Hansen (9).

Russian Pea-shrub

Caragana frutex.
Caragana frutex, Koch. Caragana frutescens, De Candolle.

A handsome shrub of erect habit, up to 10 feet in height; distinguished from the other species of Caragana by being entirely unarmed with no down.

"**Caragana frutescens,** DC.—Native of central and southern Russia, the Caucausus, and China. This is a dwarf Caragana with large, very dark green leaves. The yellow blossoms appear the latter part of May; not a profuse bloomer, but the blossoms are large. A very hardy bush that we are now testing for dwarf hedges for the lawn." N. E. Hansen (9).

When in bloom, this was noted as the most ornamental of all the Caraganas in the station collection.

Littleleaf Pea-shrub

Caragana microphylla.
Caragana microphylla, Lam.

Altagana is the common name of this species according to Bean (Trees and Shrubs Hardy in The British Isles). This species is readily distinguished from all other Caraganas by the 6 to 9 pair of leaflets and the small size of the leaflets, the smallest scarcely one-eighth inch long. "**Microphylla**" means small-leaved.

"Small-leaved Pea-tree. Native of Siberia, Dahuria and Mongolia. A very hardy bush 5 feet in height, with small leaves; of erect habit. A very profuse bloomer in late May and the first three weeks of June. The yellow blossoms are large and showy. Our specimens are budded on **Caragana arborescens** stock; this method of propagation would make the plants expensive, but the bushes seed so abundantly that propagation by seed should be an easy matter. One of the choicest Caraganas for the lawn and worthy of general cultivation." N. E. Hansen (9).

In the fall of 1924 plants of this species were observed by the writer at Manchuli, a station on the Siberian railway on the boundary line of Manchuria and Siberia.

Dwarf Pea-shrub

Caragana pygmaea.
Caragana pygmaea, De Candolle.

"**Caragana Pygmaea,** DC Dwarf Pea-tree. Native of the Caucasus, Siberia, Thibet and Tartary. A low open spreading bush with gray sparse foliage. Blossoms reddish yellow, abundant at the last half of May and first half of June. Closely allied to **Caragana arenaria,** Dippel." N. E. Hansen (9).

This species seeds freely at this station. A shrub three feet in height; some of the specimens were partly subdued by the sprouting of the **Caragana arborescens** stock upon which they were grafted. It is best grown from seed. The slender flexible shoots are used for tying in Siberia, being equal to willows for that purpose.

"Grafted high on **Caragana arborescens,** it forms a graceful standard tree, with pendulous branches." Alfred Rehder, in "Standard Cyclopedia of Horticulture," Bailey (3).

Caragana redowskii, De Candolle.—"**Caragana redowskii,** DC. Native of Siberia. Imported by Professor J. L. Budd from Russia. A bush now 4 feet in height, with abundant yellow blossoms during May. Hardy and desirable." N. E. Hansen (9).

Caragana cuneifolia Dippel..—Dippel says **Caragana cuneifolia** is propagated in some nurseries (Spaeth and Moscow) as **Caragana Redowskii.** Also that in other nurseries a form of **Caragana arborescens** is propagated as **Caragana cuneifolia.** Dippel says the true **Caragana cuneifolia** Dippel is not **Caragana Redowskii,** De Candolle.

Caragana spinosa, De Candolle.—"**Caragana spinosa,** DC. Spiny Pea-bush. Native of Siberia. A hardy very spiny bush 3 feet in height. The very abundant yellow blossoms appear in late May and early June. Our two specimens are grafted on **Caragana arborescens** stock. This year a few sprouts from the stock were attacked by the gray blister beetle while the spinosa top was scarcely touched." N. E. Hansen (9).

According to Pallas, the Russian botanist, **Caragana spinosa** is plentiful around Pekin, China, and the branches are stuck in clay on the tops of walls to keep off trespassers, just as broken glass is used in England.

Fendler Ceanothus

Ceanothus fendleri.
Ceanothus Fendleri, Gray.

A very graceful shrub of almost creeping habit. A native from New Mexico and Arizona to South Dakota.

"Fendler's Ceanothus (**Ceanothus fendleri,** Gray). A low, much branched, spiny shrub with dense clusters of smooth flowers. Black Hills, "Bull Springs in the Limestone district west of Custer (Rydberg)." Thomas A. Williams (28).

"**Ceanothus Fendleri,** Gray.—Fendler's Redroot. Common in limestone districts in the Black Hills." D. A. Saunders (26).

Inland Jersey-tea

Ceanothus ovatus.
Ceanothus ovatus, Desf.

A low shrub, native from New England to Colorado and Alabama.

"Redroot (**Ceanothus ovatus,** Desf.) A low shrub with rather narrow glandular-toothed leaves and clusters of fragrant white flowers. Dry hills in the southeastern part of the state and in the Black Hills." Thomas A. Williams (28).

Velvety Ceanothus

Ceanothus velutinus, Douglas.

Native from British Columbia to Colorado and California, extending eastward to the Black Hills in South Dakota. It is grown in Europe, to some extent in England, for its large dark green leaves, so glossy as to appear varnished. The leaves are thick, leathery and evergreen.

"Velvety Ceanothus (**Ceanothus velutinus,** Dougl.) A low shrub with shining, velvety leaves; found in the Black Hills." Thomas A. Williams (28).

Ceanothus velutinus, Dougl.—Velvety Redroot. In the Black Hills near Lead City." D. A. Saunders (26).

White Fringetree

Chionanthus virginica.
Chionanthus virginica, Linnaeus.

A large shrub or low slender tree, to 30 feet, native from Pennsylvania to Florida and Texas, with very showy white flowers. Native of the Oleaceae or Olive family. At a distance this reminds one of the Pekin and Amur Lilaes which belong to the same family and bloom much later. Good specimens of the Whitefringe are flowering freely at Sioux Falls (C. O. Bailey); and Centerville (F. A. Berven), and indicate it is hardy enough for the southern part of the state, at least in sheltered places. In Iowa plantings the surprising hardiness at the North of this far southern species has been noted.

W. J. Bean reports concerning the White Fringe in England (5): "Native of the eastern United States, from Pennsylvania southward; introduced in 1736. This is one of the most beautiful and striking of North American shrubs, and is perfectly hardy in this country. I have never seen it flower so well here, however, as in Central Europe and in the United States, where the shrub in June is almost hidden in the profusion of pendent masses of blossom. There is nothing like it among flowering shrubs except its Asiatic ally."

"Tall; dark green foliage turning yellow in autumn. Flowers pure white, fragrant, in loose drooping panicles. Bluish plum-like fruits." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Buttonbush

Cephalanthus occidentalis.
Cephalanthus occidentalis, Linn.

A shrub, 3 to 12 feet, native from New Brunswick and Ontario to Florida, Texas and California; also eastern Asia.

A very distinct shrub with glossy foliage and attractive in late summer with creamy-white flowers in slender-stalked round heads. Does best in swampy soil and suffers in dry seasons. Reported hardy at Sioux Falls, South Dakota.

Silverblotch Dogwood

Cornus alba argenteo-variegata.
Cornus alba elegantissima. Cornus alba elegantissima variegata.

A very attractive ornamental shrub with white-variegated leaves and bright red bark. Hardy at Brookings but the plants were worked on plain green-leaved stocks. As an experiment some of the sprouts below the point of union were permitted to grow; they soon choked out the branches with silver-variegated leaves. Plants of the Silverblotch Dogwood, if not on own roots, must have the green-leaved sprouts from the stock removed as they appear. Otherwise the whole bush will soon be all green-leaved.

"Similar to the above, C. **alba stolonifera lutea,** Golden Twig, except the foliage is variegated green and silver, red bark, very attractive." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Spaeth Dogwood

Cornus alba, Linn., var. **Spaethi,** Wittmack.

Considered to be the handsomest of all the variegated Dogwoods. A variety of **Cornus alba** with leaves broadly edged with yellow. The plants did not get a good start the first year and winter-killed at Brookings.

Coral Dogwood

Cornus alba siberica.
Cornus alba, Linn., var. Sibirica, Lodd.

Cornus alba, Linn., is a native of Siberia and north China. There are several cultivated varieties of which Coral Dogwood is one of the best. The small white flowers are followed by blue fruit.

"**Cornus sibirica,** Lodd.—This is referred by Rehder to **Cornus alba,** Linn., var **siberica,** Lodd. Native of Siberia. A hardy bush 5 feet in height. Remarkable for the handsome coral red color of the branches in the winter. A very desirable shrub for winter color effect on the lawn." N. E. Hansen (9).

"The Siberian Dogwood **(Cornus Siberica)** the familiar red-twigged cornel or kinnikinnick is well adapted to somewhat moist situations, and makes a fine clump that will bloom and fruit all summer." Trees for Park Planting, by L. R. Moyer, Montevideo, Minnesota (18).

"Coral or Siberian Dogwood. Hardy vigorous upright shrub, producing small white flowers in April and May, porcelain blue fruit, bright red bark in winter." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Silky Dogwood

Cornus amomum.
Cornus amomum, Mill. (Cornus sericea, Linn.)

A shrub 3 to 10 feet, native from Newfoundland to Florida, west to

North Dakota and Texas. As imported from Europe this killed back considerably. If planted, the native South Dakota form should be selected as it is hardy.

"Kinnikinnick or Silky Cornel (Cornus sericea, L). A shrub with purple stems and silky-downy leaves and branches; fruit pale blue. Found in Bon Homme and Charles Mix counties." Thomas A. Williams (28).

"Along the Missouri river in Yankton and Charles Mix counties." D. A. Saunders (26).

Roughleaf Dogwood

Cornus asperifolia.
Cornus asperifolia, Michx.

"A tall shrub with brownish branches, rough hairy leaves and white fruits. Union county." Thomas A. Williams (28).

"Along the Missouri river and in the southern part of the state, Union, Clay and Yankton counties." D. A. Saunders (26).

"Native in the eastern part of United States from Lake Erie south to Florida and Louisiana, west to Minnesota and Texas. As received from Arnold Arboretum, three specimens killed back severely and are not hardy. This species is native along the Missouri river in the southern eadge of the state." N. E. Hansen (9).

"Usually abundant along the Missouri river and eastern part of the state, where it grows as a shrub." W. H. Over (19).

Bailey Dogwood

Cornus baileyi.
Cornus baileyi, Coulter & Evans.

A shrub of erect habit, native from Pennsylvania to Minnesota and Wyoming. Probably well adapted to sandy land as it is a native of the sand dunes about the Great Lakes, in the shifting white sands. Allied to **Cornus stolonifera** from which it is distinguished 'by the lack of stolons, by the much duller and brown bark, and the white fruit with a large flattened stone, and also by the white woolliness of the lower leaf surfaces." Harriet L. Keeler, "Our Northern Shrubs." (31).

"Bailey's cornel (**Cornus baileyi**, Coulter and Evans)) A shrub with brownish-purple branches and the under surface of the leaves woolly-haired. Northern and western parts of the state." Thomas A. Williams (28).

"In the Black Hills." D. A. Saunders (26).

"A shrub of the Black Hills." W. H. Over (19).

Flowering Dogwood

Cornus florida.
Cornus florida, Linn.

Native from Massachusetts to Florida, west to Texas and Mexico. A shrub or small tree with large white flowers and scarlet fruits. The flowers are really insignificant; one-quarter inch long, green tipped with yellow. The real beauty of the plant is in the four bracts inclosing the flowerhead during the winter and opening in May. The whole forms a shown involucre 3 to 4 inches across, commonly called the "flower." This beau-

tiful shrub winter-killed at Brookings. The Flowering Dogwood is generally regarded as one of the most beautiful flowering trees of North America.

Redflowering Dogwood

Cornus florida, Linn. var. **rubra,** Andre.

A form of Flowering Dogwood in which the flower-bracts are bright rosy red instead of white. One of the most beautiful of North American flowering shrubs. Winter-killed at Brookings.

Gray Dogwood

Cornus paniculata.

Cornus paniculata, L, Her. (Cornus candidissima; C. racemosa Cy-Ag-Ar.)

A shrub 6 to 15 feet high with gray branches and white flowers and fruits. Native from Maine to North Carolina, west to Minnesota and Nebraska. At Brookings the Gray Dogwood killed back too much to be desirable.

Bloodtwig Dogwood

Cornus sanguinea.

Cornus sanguinea, Linn.

A shrub up to 12 feet high, native of all Europe and temperate west Asia. Three specimens at Brookings grew 6 feet high and were crowded out by other shrubs.

"Native of Europe, including the south of England, where it is abundant in some localities. It is a shrub of undistinguished character, its chief value being in the fine autumnal red of its leaves. The specific name applies to this and not to the young bark, which has nothing more than an occasional dark red tinge on the exposed side." W. J. Bean (5).

Red-osier Dogwood

Cornus stolonifera.

Cornus stolonifera, Michx.

A shrub to 8 feet; native from Newfoundland to Manitoba, south to Kentucky and California. Allied to **Cornus alba,** Linn., native of Siberia and North China, from which it is distinguished by the larger pointed leaves and its habit of making stolons.

"A small or medium sized shrub with smooth, red-purple branches, leaves whitish beneath and fruit white or lead-colored; widely spreading by prostrate or underground suckers. Throughout the state." Thomas A. Williams (28).

"In thickets along streams and bordering lakes throughout the state." D. A. Saunders (26).

"More or less abundant along the larger streams over the state. The inner bark of this shrub has been used extensively by the Indians for smoking. It was usually powdered when dry and mixed with tobacco." W. H. Over (19).

The Dogwood a Good Ornamental.—"In southern Minnesota there are at least three of the Dogwood family that are worthy of domestication. I

especially like the blood-red barked 'kinnikinic' that is commonly found in moist places along our water courses—almost as pretty in winter as in summer—growing easily from cuttings, and making one of the most satisfactory of all hedge plants where the hedge is for ornament only. The Dogwoods are early bloomers, very fragrant, and some of them are loaded with pretty white or blue berries in the autumn. Bank up the house with them. Even in the shade of other trees they will do their best and ask for nothing more than a fair chance in the world." Clarence Wedge, Albert Lea, Minnesota, Annual Report of South Dakota State Horticultural Society, 1923, page 246.

"Two American species, **Cornus stolonifera** and **Cornus Baileyi**, are well worth cultivating. There is also a yellow-twigged variety." L. R. Moyer, Montevideo, Minnesota (18).

"The native Dogwood has a small white blossom and a healthy foliage, but its most attractive part is its cheerful cherry colored bark in winter." J. B. Taylor, Ipswich, South Dakota, 1917.

Goldentwig Dogwood

Cornus stolonifera lutea.

Cornus stolonifera, Michx, var. flaviremea, Rehd. Cornus alba var. flaviramea, Spath.

"Similar to Cornus siberica except bark is a distinct yellow color." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

American Hazelnut

Corylus americana.

Corylus americana, Walt.

A shrub from 3 to 8 feet in height; native from Canada to Florida, west to Ontario and the Dakotas. In the station collection the writer has assembled the American Hazelnut from the various parts of North and South Dakota and Manitoba. These are all hardy. The third generation is in cultivation but none has been selected for propagation.

"This well-known nut-bearing shrub occurs in various places along the Sioux valley, in the Big Stone basin and in the Black Hills. It grows in thickets in the more heavily wooded localities." Thomas A. Williams (28).

"In thickets and open woods in the Minnesota and Sioux regions, and in the Black Hills." D. A. Saunders (26).

"The common Hazelnut of the eastern states, found growing in thickets along the Big Sioux river near Brandon, Minnehaha county, and in coulees of western Roberts county." W. H. Over (19).

"Native from Canada to Florida, west to Dakota. As received from Manitoba and North Dakota this proves hardy. The plants have not yet fruited. In South Dakota it is a native of the Sioux valley, Big Stone basin and the Black Hills." N. E. Hansen (9).

Filbert

Corylus avellana.

Corylus avellana, Linn.

The word "filbert" is given to several species of Corylus found in the Old World. Some are grown on the Pacific coast but are not hardy in the

prairie Northwest. Our native Hazelnuts are hardy but remain to be developed.

"**Corylus avellana,** Linn.—European Hazel. Filbert. Native of central and southern Europe, north Africa and west Asia. Several varieties from Germany were planted but all winter-killed." N. E. Hansen (9).

Corylus heterophylla, Fisher.—A large shrub or small tree to over 20 feet in height. Native of the Amur region of East Siberia, west China and Japan. Plants from the mountain region at Buchedu, east Siberia, proved hardy at this station.

Beaked Hazelnut

Corylus rostrata.
Corylus rostrata, Ait.

A shrub native from the north Atlantic coast west to the Pacific coast.

"Beaked Hazelnut **(Corylus rostrata,** Ait).—A shrub much like the preceding **(C. americana,** Walt.) but with ovate or ovate-oblong leaves and with the very bristly husks of the fruit prolonged into a narrow tubular beak. This replaces the common Hazelnut in the higher region of the Black Hills." Thomas A. Williams (28).

"In the Black Hills, not as common as the last." D. A. Saunders (26).

"Mountain Hazelnut **(Corylus rostrata).**—Locally common over the Black Hills, and in coulees of western Roberts county." W. H. Over (19).

Cotoneaster

There are about 40 species of Cotoneaster in the cool temperate regions of Europe, north Africa and Asia, but most abundant in China and the Himalayas. These species of Cotoneaster are all woody, mostly shrubs, seldom tree-like; and are closely allied to the Hawthornes **(Crataegus),** but have no spines and the leaves are always entire and not toothed or lobed. The word Cotoneaster comes from the Greek **Kotoneon,** quince, and **aster,** similar; from the leaves of some species resembling those of the quince.

Many of these species of Cotoneaster deserve trial. The brilliant red fruit of some species is attractive. Cotoneasters are easily propagated by seed but best from greenwood cuttings as they vary so much from seed.

Peking Cotoneaster

Cotoneaster acutifolia.
Cotoneaster acutifolia, Turczaninow. Cotoneaster pekinensis, Zabel, Cotoneaster acutifolia var. pekinensis, Koehne.

"First found by Turczaninow in the vicinity of Lake Baikal; probably distributed in other sections of eastern Asia. A very pretty shrub with dense foliage of neat erect habit. The leaves are glossy, ovate, pointed. The pink flowers in May are followed by a very heavy crop of brownish black berries. Perfectly hardy. This bush is worthy of general cultivation. Our specimens are now 3 feet in height. Dippel states the ultimate height is about 5 feet." N. E. Hansen (9).

This hardy Siberian shrub is now much planted for dwarf hedges in the prairie Northwest. The slender spreading branches are graceful. The abundant black fruit hangs on into winter. The leaves assume a bright red

and yellow coloring after frost. If near apple orchards the plants should be watched carefully for the oyster shell scale which may spread to it from the apple trees. This hardy species has black fruits, usually with 2, sometimes 3 stones.

This species, **Cotoneaster acutifolia,** Turczaninow, has been much confused with **Cotoneaster acutifolia,** Lindley, which is now a synonym of **Cotoneaster lucida,** Schlechtendal, with more glossy lustrous leaves and black fruit with 3 to 4 stones; native of the Altai mountains of Siberia. The Peking Cotoneaster has more dull green leaves, becoming nearly glabrous (smooth). In **Cotoneaster lucida,** according to Rehder in Manual of Cultivated Plants, "the leaves are glabrous and lustrous above, pubescent beneath, finally often nearly glabrous. * * * A handsome shrub with lustrous leaves and rather large black fruits. The fruits are 8 to 10 millimeters in diameter, roundish, with 3 to 4 stones."

In October 1929, at this station, in 200 average fruits of **Cotoneaster acutifolia** 88 fruits of 44 per cent had 2 seeds each; and 112 fruits, or 56 per cent had 3 seeds each.

"**Cotoneaster acutifolia,** Turczaninow, native of north and west China. This is not one of the handsomest of Cotoneasters, and is, perhaps, a poor form of **Cotoneaster lucida.** There has been much confusion between the two, owing to **Cotoneaster lucida** also having been called **Cotoneaster lucida** also having been called **Cotoneaster acutifolia;** but from that species the present one is distinguished by its dull green, not shiny, more hairy leaves, and its wooly calyx and flower-stalks." W. J. Bean (5).

Rock Cotoneaster

Cotoneaster horizontalis.

Cotoneaster horizontalis, Decne. C. Dairdiana, Hort.

A half-evergreen low shrub, native of western China. "One of the most effective shrubs for rockeries." (2).

"A dense low growing shrub branching horizontally, shiny dark green leaves, pink flowers followed by bright red fruit which gives the plant a wonderful appearance in the fall." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Cotoneaster multiflora

Cotoneaster multiflora, Bunge.

Cotoneaster reflexa, Carr.

A shrub or small tree 6 to 12 feet high, with slender arching branches, white flowers and small red fruits. Native of Sungaria and other parts of the northwest borders of China. The spreading open habit and abundant blossoms the last week in May make it one of the most elegant of the Cotoneasters. This fruited at Brookings and attained a height of 8 feet, but was too much crowded by other plants.

Flowering Quince

Japan Quince. Japonica.

Cydonia japonica.

Cydonia japonica, Pers. Chaenomeles japonica, Lindl. Pyrus japonica, Thunb. Chaenomeles lagenaria, Koidzumi.

A shrub with spreading spiny branches and large brilliant scarlet-red flowers which appear very early. Popular where hardy as a handsome lawn

shrub and for hedges. There are many garden varieties with flowers varying from white to deep scarlet; also some with double flowers.

"**Cydonia japonica,** Pers.—Japan Quince. Dippel prefers the name **Chaenomeles japonica,** Lindl. Native of Japan and China. Of two specimens from Arnold Arboretum one is dead and one survives, but kills to the ground every winter. Better results are reported from the southern edge of the state. Reported half-hardy at Mitchell." N. E. Hansen (9).

Plants of Japan quince planted later also winter-killed.

Deutzia

The Deutzias are among the most ornamental and most popular shrubs with white or blush flowers borne in great profusion along the branches.

There are about 50 species of Deutzia in east Asia and the Himalayas, and two species in Mexico. As a class they come from rather mild climates and are not among the hardiest shrubs. A very large number of hybrids have been developed. No test has been made of all these, but it is planned to make a test of the hardiest varieties at the earliest opportunity.

Deutzia differs from the allied genus Philadelphus in having ten stamens with winged stalks, often toothed or forked at the top; in the rough starry hairs or scurf on most parts of the plant, and in five petals and calyx-tubes (instead of four as in Philadelphus).

According to Alfred Rehder in Bailey's Cyclopedia of Horticulture (2) **Deutziagrandiflora,** Bunge, from north China, and **Deutzia parviflora, Bunge,** from north China, Manchuria and Mongolia and Korea, are the two hardiest at Arnold Arboretum, Boston; and **Deutzia gracilis, Deutzia Sieboldiana,** and **Deutzia scabra** are hardy as far north as Massachusetts.

According to Dippel (7) **Deutzia parviflora** is native of north China, southern Manchuria and the Amur river region.

Slender Deutzia

Deutzia gracilis.
Deutzia gracilis, Sieb. & Zucc.

A shrub to 3 feet, with slender arching branches; flowers pure white in racemes. Native of Japan.

"Deutzia, valuable shrubs of different heights, but having the same habit of bloom; a dainty bell or tassel-shaped flower borne thickly in wreaths along their branches in May. Useful in landscape work for massing. Deutzia gracilis: Dwarf growing, dense, bushy, its drooping branches wreathed in pure white flowers, in May. Also valuable for winter blooming in pots." D. B. Gurney, 1929.

Deutzia gracilis.—"Dwarfest growing, dense, bushy; wreathed with pure white flowers in May. One of the finest low growing shrubs. Does well in shade." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Fuzzy Deutzia

Deutzia scabra.
Deutzia scabra, Thunb.

A shrub to 10 feet, with leaves rough pubescent on both sides; flowers

white or pink. Native of Japan and China. Grown in many horticultural varieties, one of which is Pride of Rochester.

"**Deutzia, Pride of Rochester.**—Has very large panicles of double white flowers. White when fully opened but a striking pink when in bud. A very upright grower. Blooms late in June. These do especially well when planted on the east side of a house or partly protected by trees or other shrubs." D. B. Gurney, 1929.

Double Rose Deutzia

Deutzia scarba plena.

A double form of **Deutzia scabra,** which is a native of Japan and China.

"Vigorous; resplendent in early summer with double white flowers suffused with rose. For protected place." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Silverberry

Elaeagnus argentea.
Elaeagnus argentea, Pursh.

"A beautiful shrub with silvery leaves and fruits. Found in the Black Hills and along the upper Missouri valley." Thomas A. Williams (28).

"In limestone districts in the Black Hills." D. A. Saunders (26).

"Native from Canada south to Minnesota, Dakota and Utah. A handsome shrub with large leaves, silvery on both sides; small yellow, fragrant blossoms and silvery berries. The bush sprouts from the roots. This species is native in the Black Hills and the upper Missouri." N. E. Hansen (9).

"A low shrub growing on sandy banks in the Black Hills." W. H. Over (19).

"A stoloniferous shrub 6 to 12 feet high, the young twigs covered with rusty scurf, becoming silvery. The elliptic and undulate leaves are alternate silvery, scurfy and rusty. The axillary flowers are perfect with four-cleft style and four stamens. The numerous and fragrant silvery and yellowish flowers are followed by oblong, mealy fruit which contains a large eight grooved stone and ripens in July and August. Silverberry is common over the Canadian prairies. The edible fruit was an article of diet among the Indians but does not command the interest of the fruit growers." W. R. Leslie (17).

"The only species native of North America, reaching from the Hudson Bay territory and British Columbia to the central United States; introduced in 1813. This shrub is one of the most striking of those with silvery foliage, and when laden with its yellow delightfully fragrant flowers, few others are more pleasing. It is increased by taking off the sucker growths by which it spreads." W. J. Bean (5).

"Silver Berry (**Elaeagnus argentea**).—This is a beautiful dwarf silver leaved shrub at Moosejaw, Assiniboia. There are hundreds of acres of this plant growing in sod on the prairies. It will grow 12 to 15 feet in height." Geo. H. Whiting, Yankton, S. D., 1914.

Cherry Elaeagnus

Elaeagnus longipes.
Elaeagnus longipes, Gray. Elaeagnus multiflora, Thunberg. Elaeagnus edulis, Sieb.

"Elaeagnus longipes, Gray. (E. edulis, Hort.) Japan Oleaster, Goumi. Native of Japan and China. A choice shrub with edible slightly acid berries. Winter-killed at this station. Reported tender at Madison by A. Norby and at Yankton by C. W. Gurney." N. E. Hansen (9).

Euonymus

The genus **Euonymus** includes about 120 species in the northern Hemisphere. The Spindle tree, Burningbush and Wahoo, included in this genus all grown for their handsome foliage and fruits. **Euonymus** is the old Greek name. "In Bailey's Cyclopedia the name of this genus is spelled **Evonymus** and it is treated as feminine. The joint committee, however, has decided to use the more familiar spelling **Euonymus** and to treat the name as masculine." See Standardized Plant Names. (1).

The name Spindle tree refers to the time when the wood was used in Europe for the making of spindles.

Winged Euonymus

Euonymus alatus.
Euonymus alatus, Reg. E. alata, Maxim. E. Thunbergiana, Blume. E. striata, Loes.

A spreading shrub to eight feet, native of China and Japan; one of the handsomest, the leaves turn bright crimson in autumn. (2).

"Corked, barked or winged Wahoo. In some respects the most unique shrub we grow. Highly colored and interesting corky ridges along the branches. Ornamental fruit and very brilliant fall color. Does well in shade." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Wahoo

Euonymus atropurpureus.
Euonymus atropurpureus, Jacquin.

"Burningbush, Wahoo. Native of eastern North America west to Montana. In Dakota it is found along the Missouri river eastward. A handsome ornamental shrub, with small purple flowers in June followed by scarlet fruit. The branches are four-sided." N. E. Hansen (9).

"Wahoo or Burning Bush. A low shrub with dark purple flowers, crimson fruit and four-angled branches. One of our prettiest shrubs and easily grown. Missouri river and eastward." Thomas A. Williams (28).

"Occasional in woods in the Sioux valley, and up the Missouri river into Charles Mix county." D. A. Saunders (26).

"Grows in the Big Sioux valley, west shore of Big Stone lake, and up the Missouri river to Mulehead point. A shrub." W. H. Over (19).

Wahoo is the name given to this shrub by the Indians who used the wood for the manufacture of arrows. On the banks of the Arkansas river in Arkansas the Wahoo becomes a spreading tree, 25 feet in height. The twigs have green to grayish green bark.

"Burning Bush is a satisfactory name for this shrub which retains its flame-colored fruit long after the leaves have fallen and until the winter

storms beat it to the ground. Each separate seed-vessel develops a bright purple cover and opening discloses a seed clothed in scarlet. When these are borne in considerable numbers the bush is a conspicuous object upon the lawn or in the forest." Our Native Trees, Harriet L. Keeler (14).

Wahoo. "No other coloring in all nature is so rich as the red tone of the opening seed pod in the fall matched with a crimson of suspended seed. It is often mentioned as among the finest and most showy of ornamentals." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

"The name **Euonymus atropurpureus** is sometimes misapplied to **Euonymus europaeus atropurpureus.**" Standardized Plant Names (1).

Running Euonoymus

Euonymus obovatus.
Euonymus obovatus, Nuttall.

Native of damp ground from Ontario, Canada, west to Indiana and Kentucky. An ornamental shrub used as a ground cover under trees and in borders of shrubberies. Its prostrate habit enables it to take root as it spreads. Winter-killed at Brookings.

Common Pearlbush

Exochorda grandiflora.
Exochorda grandiflora, Lindley. Exochorda racemosa, Rehder.

"A slender spreading shrub; white flowers. Native of east China." Rehder.

"**Exochorda grandiflora,** Lindl.—Pearlbush. Native of northern China. Not in station collection at Brookings, but reported half-hardy at Mitchell and Madison." N. E. Hansen (9).

Forsythia

Forsythia or Golden-bell is represented by six species in east Asia and one in southeast Europe. All are ornamental shrubs, handsome in early spring with profuse yellow flowers. The leaves are persistent until late in autumn. **Forsythia suspensa,** Vahl., from China, is cultivated in Japan and is one of the most common.

The **Forsythias** planted in the early days at Brookings are no longer in the collection. The experience with **Forsythia** in the southern part of the state is more favorable.

"Few, if any, of the spring flowering hardy shrubs can surpass this slender and brilliant flowering shrub. It is upright in growth; foliage rich, dark green; flowers brilliant golden yellow which open in very early spring before the shrub leafs out. Two to 3 feet." D. B. Gurney, Yankton, 1929.

Showy Border Forsythia

Forsythia intermedia spectabilis.
Forsythia intermedia, Zabel, var. spectabilis, Spath. F. spectabilis, Koehne.

A hybrid shrub **(F. suspensa x F. viridissima).** Both of the parent species are native of China. An upright shrub with spreading arching branches. Originated before 1880 (22).

"Golden yellow flowers appearing in the spring before the leaves.

Adapted to shrubby backgrounds in protected places. Medium. Best of the Golden Bells." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Green Greasewood

Gutierrezia sarothrae, (Pursh) Britton and Rusby. Broom-weed.

A genus of the **Compositae** family containing about 20 species in western North America, Mexico and South America. "Native from Minnesota to Manitoba to Nevada, California and Texas and north Mexico." Rehder. Not listed in Standardized Plant Names.

"A low shrubby plant with narrow green leaves and yellow flowers. Common in the western half of the state." Thomas A. Williams (28).

"On the dry plains from the Missouri valley westward." D. A. Saunders (26).

Shrub-Althea

Hibiscus syriacus.

Hibiscus syriacus, Linnaeus. Althaea frutex, Hort.

There are about 200 species of **Hibiscus** mostly in the tropics. One of the best ornamental shrubs extensively grown in many varieties; large bell-shaped flowers in many colors, ranging from rose, scarlet and magenta to white. The flowers resemble the hollyhock which is a member of the same family, **Althaea.** In the eastern states it is much used for ornamental hedges and has escaped from cultivation from southern Pennsylvania and New Jersey southward. It is usually a large shrub attaining the height of 10 to 20 feet.

"**Hibiscus syriacus,** Linn. Shrubby Athaea. Rose of Sharon. "Nativity uncertain, but probably not Syrian, as Linnaeus supposed probably native in China. (Bailey) Not in the station collection; reported winter-killed at Vermillion and Yankton. Generally considered tender in the Northwest." N. E. Hansen (9).

In later years many varieties of **Shrub Althea** or Rose of Sharon have been tested at Brookings but all winter-killed.

"The common name Shrub-althea is not to be confused with the genus **Althaea,** which includes the Hollyhock and the true Marshmallow." Standardized Plant Names (1).

Common Sea-buckthorn

Hippophae rhamnoides.

Hippophae rhamnoides, Linnaeus.

"A thorny silver-leaved shrub, attaining a height of 20 feet. Native throughout Europe, along lakes and mountain streams in the Caucasus, northern Persia and the Ural, Altai and Baikal sections of Siberia." In Siberia the plant is used for hedges and the acid, orange-yellow berries are much used for culinary purposes and are not considered poisonous. The French form of this species winter-killed at St. Petersburg, Russia, while the form from Irkutsk, on Lake Baikal, Siberia, proved hardy. Many plants of this Irkutsk form, secured by the writer at St. Petersburg for the United States Department of Agriculture in 1897, proved perfectly hardy, have been once transplanted, and bore this year. The plants make

a neat silvery hedge. The German name "Sandborn" is brief and suggests "Siberian Sandthorn" as the name of this Irkutsk form.

Fr. Th. Koeppen* writes: "The berries are of pleasant acid tasts and form the favorite food of the pheasants which find a favorite habitat in the often extensive Sand Thorn thickets. They serve as table dainties and

Fig. 1.—HIPPOPHAE RHAMNOIDES—SIBERIAN SANDTHORN
This is the Siberian form. The fruit is abundant, orange colored, and highly ornamental in late fall and early winter. In the 1930 tour to Europe, fruit branches of this species were noticed on display in florists' windows, set off by sprays of brown oak leaves

* Beitraege zur Kenntniss des Russischen Reiches und der angrenzenden Laender Asiens. V. P. 646, St. Petersburg, 1888.

especially in Siberia for the manufacture of cordial. The Sand Thorn is also used for hedges, and also as a binder in sandy soils."

"The name Siberian Sandthorn is used by the writer for this Siberian importation as it is distinct from the tender form from western Europe. The attractive orange-yellow berries hang on the bush far into the winter. The orange color of the berries makes the plant of striking beauty and valuable as a shrub for winter effect. This plant is dioecious, each plant being either pistillate or staminate. Only the pistillate or female plant bears fruit. The pollen is carried by the wind from the staminate plants. In a lot of plants grown from seed both sexes appear so there is no trouble about pollination. A solitary pistillate plant can be pollinated by hand; a branch being tapped when the pollen is ripe causing a little shower of the pollen or yellow dust to fall over the pistillate blossoms. A more convenient way is to graft a limb or two of the staminate on the pistillate plant so as to provide pollen at the right time." N. E. Hansen (9).

Hippophae salicifolia, D. Don.—A somewhat spiny tree 40 feet high with dull green leaves, silvery beneath and pale yellow berries. Less ornamental than the Siberian Sandthorn. Native of the Himalayas up to 10,000 feet altitude and of Nepal, north India. Not sufficiently hardy at Brookings.

Snowhill Hydrangea

Hydrangea arborescens grandiflora.
Hydrangea urticifolia, Hort.

The name Hydrangea grandiflora is "sometimes used erroneously for the Peegee Hydrangea, horticultural variety of Hydrangea paniculata, and for the Snowhill Hydrangea, horticultural variety of Hydrangea arborescens." Standardized Plant Names." (1).

Hydrangea arborescens, Smooth Hydrangea, is an erect shrub 4 to 10 feet high; native from New Jersey to Iowa, south to Florida and Missouri. A very beautiful shrub with large heads of white flowers. It is a good bloomer at Sioux Falls and Yankton. The best cultivated form if this species is probably the Snowhill Hydrangea (Hydrangea arborescens, var. grandiflora, Rehder) which was found wild in Ohio before 1900; this has pure white flowers all of the sterile type.

"This magnificent perfectly hardy American shrub has snow-white blossoms of largest size. One of its most valuable characteristics is its coming into bloom just after the passing of all early spring-blooming shrubs, flowering from early June until late July. This does better planted in partially shady places." D. B. Gurney, Yankton, 1929.

"Blooms from midsummer on, flowers similar to snowball but larger. Pure white. Good in shade. Medium." G. B. Tuthill, Sioux Falls, South Dakota, 1931. In winter the plant dies down nearly to the ground. The plant does well on the northeast corner of the house or on the north or east side, never on the south or west. A. N. Schaefer, Sioux Falls, South Dakota, 1931.

Hydrangea Peegee

Hydrangea paniculata grandiflora.
Hydrangea paniculata, var. grandiflora, Sieb. Hydrangea paniculata, var. hortensis, Maxim.

"The name **Peegee,** as a colloquial abbreviation of **P(aniculata) G(ran-**

diflora) is firmly established in the trade as the only common name of this plant." Standardized Plant Names (1).

"Native of Japan. A number of young plants set in the spring of 1896 did not prove hardy in nursery row without winter protection. It is one of the choicest of all shrubs, with large panicles of white flowers over a foot in length in August and September, when flowers are scarce. Experience elsewhere indicates that when well established and given suitable mulching, watering and winter protection it will give satisfaction, at least in the southern part of the state. It is reported hardy at Sioux Falls and Mitchell, and among the "less hardy or tender" at Madison." N. E. Hansen (9).

"Large flower, immense panicle greenish white flowers turuing to shades of pink, lilac and bronze. Fine for winter bouquets. The grandest of all flowering shrubs." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Kerria

Kerria japonica.
Kerria japonica, De Candolle. Corchorus japonicus, Thunberg.

A beautiful shrub 6 feet high, forming a dense mass of glossy smooth branches. A member of the Rose family **(Rosaceae)**. Popular in the east for its bright green foliage and showy yellow flowers; in the winter conspicuous by its green branches. Winter-killed at this station.

Kerria is not really native in Japan. Kerria is a native of China but has long been cultivated in Japan. The name **Corchorus** is an error, as that is a genus allied to the lindens.

Beauty Bush

Kolkwitzia amabilis.
Kolkwitzia amabilis, Graebner.

The name Beauty Bush was given to this plant by E. H. Wilson (35), who brought seed in 1901 from the high mountains of northern Hupeh, China. E. H. Wilson writes (34):

"This monotypic plant was discovered sometime between 1890 and 1895 in Shensi by Pere J. Giraldi, on whose herbarium specimens the genus was founded by Graebner.

"I met with the plant but once, about a score of bushes growing among rocks at an elevation of between 9,000 and 10,000 feet on the high range which forms the watershed between the Yangtsze and Han rivers in the Fang magistracy." This is in the province of Hupeh.

This new shrub is related to the Weigela and honeysuckle to which it bears some resemblance.

Beauty Bush—"A new lovely free growing graceful shrub of extreme hardiness covering itself in spring with clusters of small, tubular flowers of the honeysuckle type, borne in such profusion that the bush is one cloud of delicate pink. In all stages and in all seasons this is a lovely thing." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

"Soil. Soils of good drainage should make for perfect hardiness. W. H. Judd, of Arnold Arboretum notes, "To be successful Kolkwitzia must be grown where the air circulates freely during the winter, otherwise the previous year's wood is liable to get winter-killed" (35).

Shrub Bushclover

Lespedeza bicolor.
Lespedeza bicolor, Turczaninow.

The genus Lespedeza contains about 50 species in North America, Asia and Australia; most of them not of horticultural interest. One of them, **Lespedeza striata,** or Japan Clover, is grown extensively in the South for forage. The Shrub Bushclover attains a height of 10 feet. It was introduced to Europe by Maximowicz, the Russian botanist, in 1856.

"Native of northern China, Japan, Manchuria, Mongolia and Korea. A shrub 5 feet in height with slender graceful branches and small leaves. The bushes kill back about one-third but flower freely every year from young shoots of old wood. Not a showy bush, but the numerous side shoots are full of racemes of small, purple and rose-colored pea-shaped flowers which are used for small bouquets. Flowers appear all summer beginning early in July." N. E. Hansen (9).

Ligustrum acuminatum

Ligustrum acuminatum, Koehne.
Ligustrum acuminatum, Koehne. Ligustrum ciliatum, Rehder, not Blume. Ligustrum medium, Hort., not Franch. & Sav.

A shrub to 6 feet, with erect spreading branches. Leaves ovate-lanceolate, acute at both ends; the first Privet to lose its leaves in autumn. Native of Japan. Winter-killed at Brookings.

Amur Privet

Ligustrum amurense.
Ligustrum amurense, Carr. Ligustrum ibota, var. amurense, Hort.

A shrub of tall upright dense habit, to 15 feet, with oval or oblong glossy leaves, which persist late in fall; in mild climates about half-evergreen. Native of Japan and China. In sheltered place, about half-hardy at Brookings, with many dead limbs.

"Hardy at Yankton. Foliage glossy green, holds its color well into late fall. Will stand shearing to any extent. This is a strictly first class ornamental hedge plant and should be planted extensively in localities where they are hardy. Plant 10 inches apart." D. B. Gurney, Yankton, 1929.

Ibota Privet

Ligustrum ibota.
Ligustrum ibota, Sieb. Ligustrum obtusifolium, Sieb. & Zucc.

A graceful shrub, to 10 feet, with pubescent (hairy) branches. Ibota is the native Japanese name.

"Native of Japan. Of three specimens planted, one winter-killed and the others were killed to the ground. Not sufficiently hardy." N. E. Hansen (9).

Regel Privet

Ligustrum ibota, Sieb. & Zucc. **regelianum,** Rehder.
Ligustrum regelianum, Koehne. Ligustrum ibota, var. obovatum, Dippel.

A variety of the Ibota Privet, of low dense habit, with horizontally spreading branches. Winter-killed at Brookings.

California Privet

Ligustrum ovalifolium.

Ligustrum ovalifolium, Hassk. Ligustrum californicum, Hort. Ligustrum japonicum, Hort., not Thunb. Ligustrum medium, Franch. & Sav.

Native of Japan; a tall shrub of upright habit, with branches entirely smooth. Much used for hedges where hardy. At Brookings the 27 plants of California Privet all winter-killed.

European Privet

Ligustrum vulgare.

Ligustrum vulgare, Linnaeus.

Native of Europe, north Africa and west Asia. A tall shrub with leaves lance-shaped, smooth; flowers small, dull white, terminating the twigs; first round, small, black. Much used for hedges in Europe but not so much as formerly. Not hardy in the prairie Northwest. There are many garden forms; three of them have been tested at Brookings:

Ligustrum vulgare fructu luteo, Hort.—A variety of European Privet with greenish yellow fruit. Winter-killed at Brookings.

Ligustrum vulgaris foliis aureo-variegatum, Hort.—A variety of European Privet with leaves blotched with yellow. Winter-killed at Brookings.

Ligustrum vulgare atrovirens, Hort.—A variety of European Privet. Of sparse growth; leaves dark green turning to dull purple-brown, persistent into the winter. Winter-killed at Brookings.

Lowdense Privet

Ligustrum sp.

"A splendid low hardy almost evergreen hedge. Leaves heavy, rich dark green color retained nearly all winter. Our best substitute for the dwarf boxwood and unsurpassed for edging paths and borders or trimmed to formal specimens." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Lowdense Privet originated about 15 years ago in a block of Ligustrum vulgare grown by Henry Kohankie and Son, Painesville, Ohio. The original plant is now 3½ feet high and 3½ feet across.

The Honeysuckles

White Belle Honeysuckle

Lonicera albida, Zabel.

"**Lonicera bella albida,** Zabel, (Zabel is a horticulturist in Germany who has done considerable work in hybridizing shrubs). A hybrid variety (L. Morrowi x Tatarica). A hardy shrub now 7 feet in height; of spreading habit, very distinct because of its small bluish leaves. The white flowers in June are followed by red berries, which are mostly taken by the birds. Worthy of cultivation." N. E. Hansen (9).

Hardy and a very free bloomer.

"**Lonicera bella atrorosea,** Zabel. Much the same as above, blossoms dark pink, berries red. Height 8 feet, a large spreading bush of open habit. A hardy shrub, much like L. Tatarica, but not so compact." N. E. Hansen (9).

"**Lonicera bella candida,** Zabel.—A hardy variety of strong spreading habit; flowers white, berries red. Height now 8 feet. Leaves rather small, bluish green." N. E. Hansen (9).

"**Lonicera bella incarnata,** Zabel. A large spreading bush now 7 feet in height, a profuse bloomer, blossoms pink. In bloom from late May to June. Hardy and desirable." N. E. Hansen (9).

"**Lonicera bella rosea,** Zabel. A very free bloomer. The showy rose-colored blossoms are followed by red berries, bush of open habit and strong growth. Hardy. Height 7 feet. Needs pruning at the tips. The heavy crop of berries is mostly taken by the birds." N. E. Hansen (9).

Sweetberry Honeysuckle

Lonicera caerulea.
Lonicera caerulea, Linnaeus.

"**Lonicera caerulea,** Linn. Native in the Alps and mountains of central Europe, in northern Europe and northern Asia, Canada westward to Alaska as well as in the mountains of northern United States and mountains of California. A variable species; the numerous varieties are divided into nine groups by Dippel. A hardy bush, now 3 feet in height, of dense habit. The yellowish white flowers appear during May and are followed by blue black berries; the leaves are bluish green." N. E. Hansen (9).

A wide spreading and very variable species. In all these, two flowers appear to rise from one ovary, forming an oval berry.

"The single oval berry which constitutes the fruit is not, as was long supposed, the wholly united ovaries of each pair of flowers, but really a pair of free ovaries enclosed by the cupula—an upgrowth of the bractlets." W. J. Bean (5).

Lonicera caerulea var. **dependens,** Regel.

This variety of **Lonicera caerulea** is a native of Turkestan. Of upright habit; branches rather slender, bright red, smooth or slightly hairy; fruit rather sweet, said to be a market berry in Turkestan.

Lonicera caerulea graciliflora.
Lonicera caerulea graciliflora, Dippel. Lonicera Karelinii, Hort. not Bunge.

A native of Turkestan.

"A hardy bush now 4 feet in height. The bluish green and many-branched dark red young shoots give it a dense neat upright habit and distinct expression. Worthy of cultivation." N. E. Hansen (9).

Lonicera caerulea kamschatica.

Kamschatica is a variety of **Lonicera caerulea** received from Russia. It is an upright, much-branched shrub, 7 feet in height.

Lonicera caerulea Kirilowi, Hort.

"This is variety **viridifolia** of Dippel. This variety forms a dense roundish compact bush 4 feet in height with numerous dark red branches and lively green leaves. Flowers yellowish white in May and early June followed by bluish berries. A hardy bush of distinct habit." N. E. Hansen (9).

Lonicera caerulea praecox, K. Koch & Hort.

"The name praecox probably refers to its early leafing and blooming. A hardy bush now 3 feet in height, of dense habit. In bloom during the first half of May." N. E. Hansen (9).

Probably native of Europe only. Of dwarfish habit; berries bright light blue, ripening early.

American Fly Honeysuckle

Lonicera canadensis.
Lonicera canadensis, Marsh. Lonicera ciliata, Muhlenb.

A shrub 5 feet high; native from Quebec to Saskatchewan, south to Michigan and Minnesota. Flowers in pairs, yellowish sometimes slightly tinged red; fruit light red. Leaves ovate, rounded or cordated at the base. Corolla tube much enlarged at the base. The berries are united only at the base. Plants hardy.

Coralline Honeysuckle

Lonicera chrysantha.
Lonicera chrysantha, Turcz. Lonicera gibbiflora, Rupr.

A very hardy tall upright shrub attaining a height of 12 feet. Branchlets soft hairy, rarely nearly smooth. Leaves dark green and nearly smooth above, hairy beneath at least on the veins. Flowers yellowish white changing to yellow, with corolla tube much swollen at base; fruit coral red. Native of northwestern China, the Amur and Usuri river regions. A handsome shrub in autumn with abundant bright red fruit.

Lonicera chrysantha, Turcz. var. **regeliana,** Zabel.
Lonicera regeliana, Kirchn.

Differs from the typical **Lonicera chrysantha** in the smaller more yellowish flowers. Of erect habit, 10 feet in height, hardy.

Lonicera coerulescens, Dippel.

"A hybrid bush honeysuckle, height now 5 feet, hardy, of dense strong growth; young leaves are light green, changing to a dark bluish-green. Free bloomer, blossoms small carmine pink, from the middle of May to early June. Dippel states that this is closely related to **L. micrantha,** Regel; Koehne and Rehder that it is probably a hybrid **(L. tatarica x Xylosteum).**" N. E. Hansen (9).

These specimens are now hardy shrubs, 15 feet in height. Berries yellowish red.

Alfred Rehder, 1927, makes **Lonicera coerulescens,** Dippel, a synonym of **Lonicera xylosteoides,** Tausch., with the following other synonyms: **Lonicera nepalensis,** Kirchn., and **Lonicera micrantha,** Zabel, not Regel (22).

"Leaves usually rhombic-ovate, broad-cuneate at base, bluish green, slightly pubescent: flowers small, pinkish. Originated before 1838." Alfred Rehder, 1927 (22).

Limber Honeysuckle

Lonicera dioica.

A native twining vine, 3 to 10 feet, or frequently a straggling shrub with long slender branches. See under "Climbing Vines" in this bulletin.

Yellow Honeysuckle

Lonicera flava.
Lonicera flava, Sims. Lonicera fraseri. Pursh. Caprifolium fraseri, Pursh.

A climbing honeysuckle with orange-yellow fragrant flowers. Native from North Carolina to Missouri, Arkansas and Oklahoma. A free bloomer; no trellis was provided. Rare in cultivation and usually the more northern species, **Lonicera prolifera,** is cultivated under this name.

Spangle Honeysuckle

Lonicera gracilipes.
Lonicera gracilipes, Miq.

A graceful shrub native of Japan, with pink, rarely white, flowers and pendulous scarlet fruits. Winter-killed at Brookings.

Hairy Honeysuckle

Lonicera hirsuta.
Lonicera hirsuta, Eaton. Caprifolium pubescens, Goldie.

An attractive high climbing shrub with scentless orange-yellow flowers. Native from Quebec to Saskatchewan, south to Michigan and Nebraska.

"A twining shrub with the leaves downy-hairy beneath and with whorls of yellow or purplish flowers in the axils of the upper leaves. Moist, rocky banks in the lower Sioux valley and in the Big Stone Basin." Thomas A. Williams (28).

Iberian Honeysuckle

Lonicera iberica.
Lonicera iberica, Bieb.

"Native of southern Russia, northern Persia and western Asia. A dense compact bush 3 feet high and five feet across. The small gray-green pubescent leaves give the bush a distinct appearance. Kills back at tips and sometimes one-half, but appears hardy enough for a place in a large collection, but not enough to recommend for general cultivation." N. E. Hansen(9).

Blueleaf Honeysuckle

Lonicera korolkowi.
Lonicera korolkowi, Stapf. Lonicera floribunda var. Korolkovii.

A shrub of spreading graceful habit, 10 feet high. The young shoots downy; flowers rose colored; berries bright red, leaves smooth, gray or bluish green; slightly pubescent above more densely so beneath. Plant hardy at Brookings, 10 feet, open habit.

Lonicera ledebouri

Lonicera ledebouri, Eschscholtz.
Lonicera intermedia, Kellogg.

A tall shrub, sometimes climbing. Native of California; with 4-angled smooth young shoots. The flowers are orange-scarlet red outside; berries black. Winter-killed at Brookings.

Lonicera maximowiczii, Regel. —A hardy shrub 6 to 10 feet high; of open spreading habit, with smooth or slightly bristly purple branches. Flowers violet-red, berries red. Native of Manchuria and Korea.

Lonicera micrantha, Regel.—"Native of Turkestan. Height 6 feet, of open spreading habit; needs pruning. Hardy shrub with pink flowers in May and early June; not a free bloomer. Berries red. Not quite as desirable as **L. Tatarica.** Rehder refers this to **L. floribunda;** Koehne is not yet convinced of this (p. 550)." N. E. Hansen (9).

According to Bailey, the real **Lonicera micrantha** is not in cultivation

and the plant cultivated under this name is usually **Lonicera parvifolia,** Jaeger, or **Lonicera xylosteoides.**

Bunchberry Honeysuckle

Lonicera minutiflora, Zabel.

Rehder, in "Manual of Cultivated Plants," classifies this as a hybrid **(Lonicera morrowii x Lonicera xylosteoides).**

"A hybrid variety **(L. micrantha x Morrowii).** Height 8 feet, hardy, of spreading habit. Small yellowish white blossoms in late May and early June followed by yellow berries." N. E. Hansen (9).

The fruit is conspicuous, not being hidden by the small narrow leaves.

Morrow Honeysuckle

Lonicera morrowi.
Lonicera morrowi, A. Gray.

Native of Japan. A shrub to 8 feet, with wide spreading branches; the young shoots gray with down; flowers creamy white changing to yellow; fruit dark red, rarely yellow. Leaves dark green above, grayish tomentose (hairy) beneath.

"Very distinct in its habit; handsome in flower and in fruit. It hybridizes easily with **Lonicera tatarica** and the hybrids are more common in gardens than the true species." Alfred Rehder (2).

L. R. Moyer, Montevideo, west central Minnesota, reported good results in 1917 with the Morrow Honeysuckle.

"Morrow's Honeysuckle **(Lonicera Morrowi).** A medium sized honeysuckle having widestread branches; leaves a downy gray underneath; flowers white, changing to yellow; berries bright red." D. B. Gurney, Yankton, South Dakota, 1929.

"Spreading prostrate form, white blossoms. Useful where low effects are desired." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Lonicera nigra, Linnaeus.—Native of the Pyrenees, Alps and other mountain regions of middle and south Europe; also Korea. Height 3 to 5 feet, slender, with smooth branches. Flowers small, pink; berries black, united only at the base. Hardy.

Rutarian Honeysuckle

Lonicera notha alba, Zabel.

"**Lonicera notha** is considered by Koehne to be a hybrid **(L. ruprechtiana x tatarica).** A hardy bush of strong growth, height 6 feet, flowers yellowish white, appearing in May, followed by red berries." N. E. Hansen (9).

There are several varieties of **Lonicera notha,** differing in color of the flower.

In Standardized Plant Names (1) the use of the common name Rutarian Honeysuckle, is recommended for **Lonicera notha.**

Lonicera notha carnea, Hort.—"A hardy bush of dense spreading habit and rank growth. A free bloomer during May, flowers flesh colored, followed by small berries." N. E. Hansen (9).

Lonicera notha carneo-rosea, Zabel.—"Height 9 feet. A hardy bush of

very upright habit, not a free bloomer; blossoms yellowish red in late May and early June; berries red." N. E. Hansen (9).

Lonicera notha gilva, Zabel.—"A variety with yellowish white flowers, not especially desirable." N. E. Hansen (9).

Lonicera notha grandiflora, Zabel.—"A strong growing bush 7 feet in height, hardy and desirable. Large, yellowish flowers in May; berries red." N. E. Hansen (9).

Lonicera nummulariaefolia, Jaub & Spach.—"Native of Persia; Turcomania, Turkestan and also occuring in Spain. A bush 5 feet in height with light gray green leaves of this open habit and some dead shoots. Pink flowers. Not recommended." N. E. Hansen (9).

Buckthorn Honeysuckle

Lonicera orientalis.

Lonicera orientalis, Lamarck.

A shrub to 10 feet; shoots quite smooth. Native of western Asia to Kamschatka.

"Native in the Orient and the high mountains of India and probably also in eastern Asia. A hardy bush now 5 feet high with large dark green leaves. The foliage is neat but the pink blossoms in late May and early June, followed by small blue black berries, are not especially conspicuous." N. E. Hansen (9).

Lonicera orientalis spec. China, Dipp.—"A Chinese form of this Asiatic species. Height 4½ feet, neat and distinct in foliage but kills at the tips and is not a free bloomer. This and the two following are classified as forms of L. orientalis longifolia by Dippel." N. E. Hansen (9).

Lonicera orientalis spec. India, Hort.—"Bush 5 feet in height. Habit thin and open, due to the killing back of the young branches. It is sufficiently hardy to produce a few blossoms and berries but is too tender to recommend." N. E. Hansen (9).

Referred by Dippel to **Lonicera orientalis** var. **longifolia.**

Lonicera orientalis Kamtschatica, Hort.—"This is a Kamschatian variety of the oriental honeysuckle. A hardy bush now 3½ feet in height, with neat clean habit and dense foliage. Blossoms pink, small, in late May and during June." N. E. Hansen (9).

Referred to **Lonicera orientalis** var. **longifolia,** Dippel, by Rehder. Geographical varieties are of great importance from the horticultural standpoint, but in many cases may not be possible to distinguish by taxonomic characters.

Lonicera orientalis, Lam. var. **longifolia,** Dippel.

Lonicera Kesselringii, Regel. Lonicera savranica, Hort.

A variety of **Lonicera orientalis,** the Buckthorn Honeysuckle. Now 7 feet in height, of upright habit, hardy; flowers smaller, reddish; corolla scarcely swollen at base.

Woodbine

Lonicera periclymenum.

Lonicera periclymenum, Linnaeus. Lonicera germanica, Dietr. Caprifolium periclymenum, Roem. & Schult.

'Native of central and southern Europe, north Africa and the Caucausus. A choice hardy climbing honeysuckle with fragrant flowers, red

outside and yellowish within; the main period of bloom is during June." N. E. Hansen (9).

In its wild state the stems grow over 20 feet long. Berries red.

Pyrenees Honeysuckle

Lonicera pyrenaica.
Lonicera pyrenaica, Linnaeus.

A small upright ornamental shrub, 3 to 4 feet high. Native of Pyrenees and Balearic Islands. Attractive in bloom; flowers white, often fleshed pink; berries red. Not hardy at Brookings.

Mistletoe Honeysuckle

Lonicera quinquelocularis.
Lonicera quinquelocularis, Hardw. Lonicera diversifolia, Wall. Lonicera royleana, Wall.

An upright shrub with light yellow flowers and white berries. Native of Kashmir and the Himalayas to Afghanistan and Beluchistan. Winterkilled at Brookings.

Manchurian Honeysuckle

Lonicera ruprechtiana.
Lonicera Ruprechtiana, Regel.

Native of Manchuria and north China. A handsome shrub to 12 feet high, with upright and spreading branches; leaves small, dark green above, grayish pubescent beneath. Flowers white, changing to yellow; fruit coral-red or orange-red.

L. R. Moyer of Montevideo, west central Minnesota, reported good results with this species.

"This species and **Lonicera morrowii** are likely to hybridize with **Lonicera tatarica**; these hybrids are very common, and may be recognized by the glabrescent foliage and the tinge of pink in the flowers. The true **Lonicera ruprechtiana** is much rarer in gardens than its hybrids." Alfred Rehder (2).

Lonicera salicifolia, Zabel

Lonicera ruprechtiana var. salicifolia, Dippel. Lonicera ruprechtiana x micranthoides, Zabel.

"Koehne says this is a hybrid **(Lonicera micrantha** x **Ruprechtiana).** A hardy shrub now 7 feet in height, of dense, somewhat spreading, habit; leaves broad, willow-like." N. E. Hansen (9).

In 1927 this was a tall wide spreading perfectly hardy shrub, 12 feet across, very productive of flowers and fruit. Handsome gray green foliage, flowers yellowish white; berries red.

Segrez Honeysuckle

Lonicera segreziensis, Lavallee.
Lonicera diversifolia, Hort. gall, not Wall. Lonicera hispida, Hort., not Pall.

The original home is not known. Probably the plant is native of the higher mountain regions of the Himalayas, and originated in a nursery in France from seed sent from that region with **Lonicera diversifolia,** Wall. These shrubs are now 15 feet high and 15 feet across, of open spreading

habit, free bloomers, and heavy crops of red berries. Leaves, dark bluish-green; flowers, yellowish.

"Lonicera segreziensis Lav., supposed to be a hybrid with **L. quinqueloc-ularis**, is probably only a form of **L. Xylosteum.**" A Rehder (22).

Standardized Plant Names recommends the use of the common name rather than the Latin name for this shrub.

Diervilla splendens, Kirchn

Weigela splendens, Carr.

Originated about 1850. A hybrid (**D. sessilifolia** x **D. lonicera**). "Intermediate between the parents, more similar to **L. sessilifolia**, but leaves short-petioled." (Rehder) In full bloom in July; flowers not showy. Winter-killed at Brookings. **D. sessilifolia**, Buckl. (Southern bush honeysuckle) is native from North Carolina and Tennessee to Georgia and Alabama. **D. lonicera**, Mill., native from Newfoundland to Saskatchewan, south to Kentucky and North Carolina. All species of Weigela are classified under Diervilla by botanical authorities but in the nursery catalogs Weigela is still retained. See Standard Plant Names (1).

Albert Honeysuckle

Lonicera spinosa alberti.

Lonicera alberti Regel. Lonicera spinosa, var. Alberti, Rehder. Chamaecerasus albertti.

"Native of the high mountains of eastern Turkestan. Discovered by Albert Regel and disseminated by the St. Petersburg botanic gardens. A choice, very hardy shrub, now 3 feet in height and 5 feet across, of peculiar habit; the long, slender branches are trailing, but the center of growth rises a little higher each year. The bush forms a very dense, rounded mass of bluish-green foliage; the leaves are small and linear; blossoms rose-pink, fragrant. In bloom the latter part of May and the first half of June." N. E. Hansen (9).

A "very graceful shrub." L. H. Bailey (2).

"Lonicera alberti is a pleasing shrub of graceful habit, very distinct from cultivated honeysuckles in its narrow bluish foliage." W. J. Bean (5).

Tatarian Honeysuckle

Lonicera tatarica.

Lonicera tatarica, Linnaeus.

"Tartarian Bush Honeysuckle. Native of Siberia, Tartary and southeastern Russia. A bush 12 to 15 feet in height which has proved perfectly hardy in the Dakotas, Minnesota, Manitoba and Assinaboia. This shrub has been in cultivation for many years and there are now numerous varieties differing in foliage, habit and blossom. It is one of the first shrubs that should be planted by prairie settlers on the lawn and for ornamental screens and hedges. It is easily propagated by planting cuttings in the fall the same as currants and willows. A very variable species. Under cultivation many varieties have appeared; all those tested here have proved hardy." N. E. Hansen (9).

Tatarian Honeysuckle is very free from insect attacks. A hedge may be planted as a windbreak for the farm, attaining a height of 15 to 20 feet. The branches are retained from the ground up, making an excellent windbreak and snow catcher in the most exposed places. The berries are taken

by the birds. From the ornamental standpoint the best red flowered form should be selected although the pink and white forms are also favored.

"Honeysuckle Hedges. From the 1923 list. From seed of our large imported collection of honeysuckles, especially select varieties of the Tartarian Bush Honeysuckles. We have grown some nice stocky plants. They will vary somewhat in color of blossoms and will be desirable for hedges, screens and single specimens on the lawn. Perfectly hardy far north." N. E. Hansen (11).

"Semipalatinsk Bush Honeysuckle. Note in the 1921 list: In 1913 on the dry steppes at Semipalatinsk, Siberia, I found a choice Bush honeysuckle of tall growth with yellow or red berries. This will be hardy far north. Good for hedges, screens, or as single specimens." N. E. Hansen (11).

The exact botanical status of this extra hardy form of Bush honeysuckle has not been determined. It has been grown from seed; the yellow fruit form is more numerous than the one with red berries. Work in selection is now under way. This evidently is a valuable type of Bush honeysuckle for the open exposure of the prairie.

Lonicera tatarica rosea floribunda, L. Spaeth.—"A strong-growing hardy bush with clean foliage. A very profuse bloomer, flowers rose-pink, berries red. A beautiful bush in blossom, fruit and foliage." N. E. Hansen (9).

Lonicera tatarica splendens, L. Spaeth, 1874.—"Hardy and of strong growth, a very profuse bloomer, blossoms a rich dark red in the bud changing to striped pale pink and white. Berries bright yellow, very ornamental. One of the best varieties." N. E. Hansen (9).

Lonicera tatarica virginalis grandiflora, Dauvesse.—"Large flowers, striped and marbled pink and white. Hardy, of upright habit. Berries red." N. E. Hansen (9).

Lonicera tatarica albo-rosea, Spaeth.—"Of strong growth, flowers pale pink, berries red. A very free bloomer." N. E. Hansen (9).

Lonicera tatarica angustifolia, Kirchn. **(L. Tat. augustata,** Hort; **L. angustata,** Wender.)—"Of strong growth, hardy, a profuse bloomer, flowers pink, berries red. Very attractive, both in flower and fruit." N. E. Hansen (9).

Leaves narrow, flowers light pink.

Lonicera tatarica var. grandiflora, Rehder.

Lonicera tatarica alba grandiflora, Hort. **Lonicera tatarica alba, Regel, Lonicera tatarica** var. albiflora.

"A very free bloomer, blossoms pure white. In July it is very showy from its immense crop of red berries. A strong rank grower, very desirable." N. E. Hansen (9).

Lonicera tatarica discolor, Hort.—"A strong grower, hardy. A very profuse bloomer; flowers large, rose pink and dark red; berries bright yellow, very showy. Desirable." N. E. Hansen (9).

Flowers rose inside, dark red outside.

Lonicera tatarica flore alba, Hort.—"Hardy, of strong growth. Very free bloomer; flowers white, berries red. Choice and desirable." N. E. Hansen (9).

Rosy Tatarian Honeysuckle

Lonicera tatarica rosea, Hort.
Lonicera tatarica flore rosea, Hort. Lonicera tatarica var. rosea, Regel.

"Of strong growth and upright habit, a very profuse bloomer, blossoms rose color, berries red. Very choice." N. E. Hansen (9).

Flowers rosy pink outside, light pink inside.

Red Tatarian Honeysuckle

Lonicera tatarica var. **Siberica,** Sims.
Lonicera tatarica flore ruba, Hort. Lonicera tatarica rubrifolia, DC. Lonicera tatarica rubra, Sweet. Lonicera tatarica punicea, Sims., var. purpurea, Hort.

"Hardy; a profuse bloomer, flowers deep pink, very attractive, berries red." N. E. Hansen (9).

Lonicera tatarica fructu lutea, Hort.—"Hardy. A profuse bloomer, blossoms white, berries yellow. Attractive." N. E. Hansen (9).

Lonicera tatarica gracilis, Hort.—"A hardy bush of strong, upright growth, a free bloomer through May and early June. Flowers large and white with pink cast, followed by red berries." N. E. Hansen (9).

This appears to be **Lonicera tatarica** var. **parvifolia,** Jaeger, "Great tatarian Honeysuckle" of Standardized Plant Names (1).

Lonicera tatarica pulcherrima, Hort.—"Hardy, of strong growth. Pulcherrima means most beautiful, a very profuse bloomer in late May and nearly through June; flowers dark pink." N. E. Hansen (9).

Lonicera tatarica, Linnaeus, var. parvifolia, Jaeger..

Lonicera parvifolia, Hayne, not Edgew. Lonicera gracilis, Carr. According to Rehder, native of Turkestan; flowers white, fruit orange-red.

"**Lonicera parvifolia,** Hayne. The habitat is said by Dippel to be the same as **Lonicera tatarica,** and that it is often confused with white flowered form of that species, but it is quite distinct. Koehne mentions it as perhaps a hybrid. Rehder in Bailey's Cyclopedia refers it to **Lonicera tatarica,** Jaeger. A hardy strong growing bush 7 feet in height, a profuse bloomer in late May and early June. Flowers white followed by yellow berries. Desirable." N. E. Hansen (9).

Tibetan Honeysuckle

Lonicera thibetica.
Lonicera thibetica, Bureau & Franch. Lonicera rupicola, Hooker fil & Thoms. Lonicera rupicola, var. thibetica, Zabel.

Native of the Himalayas and west China. A low spreading shrub, to 5 feet, of dense round habit, forming an impenetrable mass of branches. Flowers pale purple, fragrant. Fruit red. A handsome shrub suitable for rocky slopes. Winter-killed at Brookings.

Lonicera tomentella, Hook. f. & Thoms.—An erect shrub with pinkish white flowers and bluish black berries. Native of Sikkim, a state south of Tibet, and the Himalayas. Winter-killed at Brookings.

European Fly Honeysuckle

Lonicera xylosteum.
Lonicera xylosteum, Linnaeus.

A tall very bushy shrub with downy young shoots. There are many garden varieties. Native of Enrope and western Siberia.

"Native of Europe, the Orient and Siberia. Flowers yellowish white, blooming in May, berries dark red. This bush kills at the tips and is not as desirable as the Tartarian Bush Honeysuckle." N. E. Hansen (9).

Barbary Matrimony-vine

Lycium barbarum.
Lycium barbarum, Linnaeus.

"The true **Lycium barbarum** and **Lycium europaeum** are probably not in cultivation; the plants sold under these names are usually **Lycium halimifolium** or **Lycium chinense.**" Standardized Plant Names (1).

Lycium barbarum is native of north Africa. The plants imported under this name were grown from seed from Kashgar, but did not persist long.

Chinese Matrimony-vine

Lycium chinense.
Lycium chinense, Mill.

"Chinese Matrimony-vine, or Box Thorn. A native of the more temperate regions of China. In the severe winter of 1898-99 our specimens were killed to the ground but otherwise appear hardy. A trailing bush 4 feet in height with long slender somewhat spiny branches, forming a dense mass of green foliage 7 feet across, full of small dull purple flowers and oval red berries, all summer and fall. A bush of somewhat weedy character, sprouting badly from the root among adjoining plants. The Box Thorns are used for covering foundation walls, fences and trellises, especially where there is opportunity for the branches to hang over a wall or similar support." N. E. Hansen (9).

The genus Lycium contains 100 species in the temperate and subtropical regions of both hemispheres. The Box Thorns or Matrimony-vines are shrubs with spiny branches and gray-green leaves; habit usually prostrate or trailing. They do well in shaded places as on the north side of a building, where they flower and fruit abundantly.

Common Matrimony-vine

Lycium halimifolium.
Lycium halimifolium, Miller. Lycium vulgare, Dunal. Lycium flaccidum, Koch.

"Native of China. Height 3½ feet. A very dense mass of slender trailing branches and grayish green leaves covered with dull purplish flowers and red berries all summer and fall. Hardy." N. E. Hansen (9).

Origin not definitely known, but is perhaps south European. It is very closely allied to **Lycium chinense,** but of less vigorous growth.

Lycium rhombifolium, Dipp.—**Lycium ovatum,** Poir.—"A native of China. This is much like **Lycium chinense.** Sprouts badly and is rather weedy." N. E. Hansen (9).

Fruit large, red, depressed at apex.

Creeping Hollygrape

Mahonia repens.

Mahonia repens, Don. **Berberis aquifolium,** Brit. & Brown. **Berberis nana,** Greene. **Odostemon aquifolium,** Rydb.

"If this group, Mahonia, is separated from Berberis as a genus, its name under American Rules is Odostemon." Standardized Plant Names (1).

"Of equal hardiness is the dwarf M. repens with gray-green foliage, similar flower and fruit, which is also a good carpet and useful plant for the rockery." E. H. Wilson (34).

This native shrub is found from British Columbia to California and New Mexico.

"A low creeping shrub with yellow wood and inner bark, and rigid, evergreen compound leaves; leaflets spiny-toothed. The rhizomes are used in medicine as a tonic and alterative. Very common along the sides of wooded canyons in the Black Hills." Thomas A. Williams (28).

Sometimes called Oregon Grape, although it is not a grape, but this name really belongs to Mahonia Aquifolium, native from British Columbia to Oregon. The fruit is utilized for jellies.

Mahonia from the Black Hills and the Bad Lands; "Not a true holly but resembles the holly in foliage. Has bright yellow flower clusters in May followed by large blue berries. The leaf color varies capriciously through the year, assuming shades of green, with flecks of red and bronze in the fall." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Myricaria dahurica, Ehrenb

Myricaria dahurica, DC (Ehrenb.).

Tamarix dahurica, Willd.

"Native of Dahuria and the Transbaikal and Altai region in Siberia. A bush now 3 feet in height, killing nearly or quite to the ground every winter, but sprouting vigorously from the root. The silvery, cedar-like foliage would be attractive for sprays and bouquets for decoration. The young shoots are tipped with small inconspicuous rose-pink flowers of no value. Closely related to Tamarix." N. E. Hansen (9).

In "Standardized Plant Names" (1) the common name for Myricaria is "False-Tamarix."

Mock Orange

Philadelphus

Syringa

"The Mock Oranges are beautiful, ornamental shrubs with opposite leaves, entire or saw-toothed and white, often very fragrant flowers. The name Mock Orange comes from their fancied resemblance to orange blossoms. The German name "Pfeifenstrauch," meaning pipe bush, refers to the woody stems which can be used for pip stems when pith is removed. The common name Syringa is somewhat confusing as that is also the botanical name for the lilacs. Koehne in a Monograph (Gartenflora 1896) describes 33 species, of which 20 are American, but for horticultural pur-

poses the number of varieties to be considered is much larger, owing to the fact that numerous hybrids have originated under cultivation. It is a difficult group to determine as many of the species are not well defined. In this bulletin experience is reported with 40 varieties. Of these 16 winter-killed and are noted in the "Black List." Many of the following 24 varieties really belong to this list as they are too tender. In the southern part of the state some of them may do better, especially if winter protection is given them. As a group the Mock Oranges are not hardy and should be planted in a sheltered place. The names are given as received and are those used in nurseries; the revised nomenclature is also given as it will probably be accepted by nurserymen in due season." N. E. Hansen (9).

The native **Philadelphus Lewisi** is the state flower of Idaho (29).

According to Rehder in "Manual of Cultivated Trees and Shrubs," (22) there are about 40 species of Philadelphus or Mock Orange in North America, south Europe and the Caucasus, and in east Asia to the Himalayas. According to Bailey the genus is essentially Asiatic and American; there are three roughly defined areas of distribution: northern Asia and Japan, western America from British Columbia to California, south Atlantic States and Mexico.

If pruning of Mock Orange is needed, it should be done after flowering because the flowers are produced on the wood formed the previous year.

"The several species and varieties of the Philadelphus should not be overlooked. The earliest to bloom and perhaps the most sweet scented is **Philadelphus coronarius**. Another very fine variety is the one called **Philadelphus speciosa** by nurserymen. **Philadelphus pubescens** is a taller growing and later blooming species. It grows to about the height of a lilac bush. **Philadelphus Lemoinei** is a smaller but very graceful shrub, with curving branches." L. R. Moyer (18).

Sweet Mock Orange

Philadelphus coronarius.

Philadelphus coronarius, Linnaeus. Philadelphus pallidus, Hayek. Philadelphus coronarius nivalis, Hort.

Common Syringa or Mock Orange is unsurpassed for the delicious and intense fragrance of the flowers. A shrub to 12 feet; native of central and southern Europe, extending east to the Caucasus, Manchuria, China, Japan and the eastern Himalayas. The flowers are yellowish white, heavily scented, about 1 inch wide. This has been cultivated in early times in Europe. Many horticultural varieties have originated under cultivation. The wide range of this plant suggests a varying degree of hardiness. One lot of Sweet Mock Orange winter-killed at Brookings, another lot has held on better and has bloomed freely.

Philadelphus coronarius, Linn. var. **acuminatus,** A. H. Moore

Philadelphus acuminatus, Lange.

Philadelphus satsumi. Philadelphus satsumanus. Philadelphus yokohama or yokohahae of cult.

Native of Yunnan Province, China, Japan, and Tsu Shima.

"**Philadelphus yokohamae**, Hort.—Native of Japan. Height 4½ feet. This shrub kills back, but blooms some every year in early July." N. E. Hansen (9).

This is now 10 feet high and a very free bloomer.

Philadelphus coronarius flore pleno, Hort.—"Height 1½ feet. Kills nearly to the ground, sprouts weak. Not hardy." N. E. Hansen (9).

Philadelphus coronarius dianthiflorus plenus, Hort.—"Height now 1½ feet. A dwarf bush with many young shoots; not desirable, as it kills to the ground every winter." N. E. Hansen (9).

Dwarf Sweet Mock Orange

Philadelphus nanus.

Philadelphus coronarius var. pumilus, West. Philadelphus coronarius nanus, Mill. Philadelphus coronarius var, nanus, Schrad. Philadelphus nanus, Hort. Philadelphus coronarius salicifolius, Hort. in part.

"A low tuft 6 inches in height, killing to the ground every winter. Too tender." N. E. Hansen (9).

Philadelphus coronarius rosaeflorus plenus, Hort.—A double flowered variety. Winter-killed at Brookings.

Philadelphus coronarius salicifolius, Hort.—Leaves willow-like; sparcely toothed. "Salicifolius" means "willow-leaved." Winter-killed at Brookings.

Philadelphus coronarius tenuifolius, Maxim.—Philadelphus coronarius tenuifolius, Rupr. & Maxim. "Native of Manchuria, and the Amur and Ussuri regions of eastern Siberia. Height four feet. Young shoots tipped dark bronze green. The white flowers appear in late May and early June. Tips kill back a little." N. E. Hansen (9).

A shrub to 6 feet with spreading slender branches. Flowers with slight or no fragrance. Dippel classified this as a variety of **Philadelphus coronarius** but it is now regarded as a distinct species. Native of Manchuria to Korea. Of no special ornamental value.

Double Mock Orange

Philadelphus dianthiflorus.

Philadelphus coronarius dianthiflorus, Hort. Philadelphus dianthiflorus, Hort.

A double-flowered variety; "dianthiflorus" means with flowers like a carnation. Winter-kills nearly to the ground; not hardy at Brookings.

Gordon Mock Orange

Philadelphus gordonianus.

Philadelphus gordonianus, Lindl. Philadelphus Lewisii, Rehd. not Pursh.

Native of British Columbia to Idaho and north California. A tall shrub, to 13 feet, with spreading branches and abundant white slightly fragrant flowers in 7-9, rarely 11-flowered racemes. Kills back three-fourths; not sufficiently hardy.

Philadelphus Gordonianus gracilis, Hort.—"The type is native of northern California to British Columbia. Height now 5 feet. Kills back considerably but not to prevent its flowering freely late in June and early in July. Flowers white, fragrant." N. E. Hansen (9).

Philadelphus gordonianus Californicus, Hort.—A variety of **Philadelphus gordonianus,** Gordon Mock Orange, probably the California form. Winter-killed at Brookings.

Philadelphus gracilis, Hort.—Probably a synonym of **Philadelphus hirsutus,** Nutt. Native from Tennessee and North Carolina to Georgia and Alabama. A shrub to 8 feet. Winter-killed at Brookings.

Big Scentless Mock Orange

Philadelphus grandiflorus.

Philadelphus grandiflorus, Willd. Philadelphus indorus, Linnaeus, var. grandiflorus, Gray. Philadelphus gloriosus, Beadle. Philadelphus laxus, Lindl., also of Lodd. Philadelphus laxus var. grandiflorus, Loud.

"The name **Philadelphus grandiflorus** is often applied erroneously, to **Philadelphus pubescens** and to Big Mock Orange, horticultural variety of **Philadelphus coronarius.**" Standardized Plant Names (1).

"Native from North Carolina and Tennessee to Florida and Alabama.

Fig. 2.—PHILADELPHUS GRANDIFLORUS
This species of Mock Orange is noteworthy for its large flowers which are abundantly produced

Similar to the preceding (**Philadelphus inodorus,** Linnaeus), but leaves larger and less lustrous and flowers slightly four-cornered in outline." Alfred Rehder, Manual of Cultivated Trees and Shrubs (22).

Leaves generally more elongate, more coarsely toothed, especially on young succulent shoots and suckers." L. H. Bailey, Standard Cyclopedia of Horticulture (2).

"**Philadelphus grandiflorus,** Willd. Native of United States from Vir-

ginia to Florida and Tennessee. **Philadelphus indorus,** Linnaeus, is given priority in Bailey's Cyclopedia. This shrub kills back nearly every winter, but not enough to prevent its flowering freely." N. E. Hansen (9).

These plants attained the height of 13 feet; of strong upright somewhat spreading habit, very abundant bloomers. Flowers scentless, 2 inches across, pure white, appearing later than most species.

Plants of **Philadelphus cordatus,** Hort., a synonym of **Philadelphus grandiflorus,** winter-killed at Brookings.

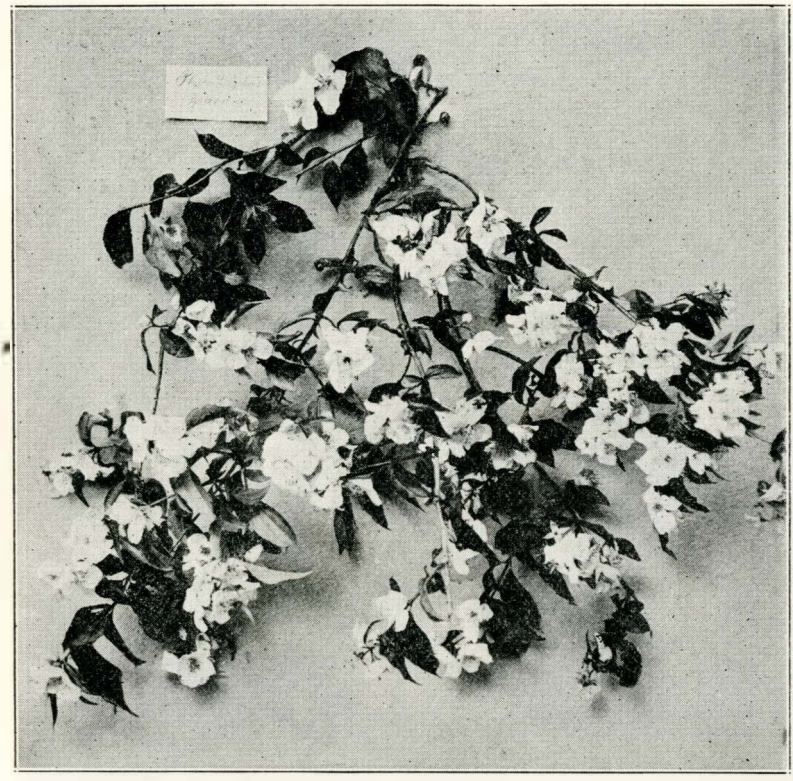

Fig. 3.—PHILADELPHUS GRANDIFLORUS
This species of Mock Orange is useful for its late flowering, thus extending the blooming season

Plants of **Philadelphus inodorus speciosus grandiflorus,** Hort., winter-killed at Brookings.

Philadelphus grandiflorus fl. pl., Hort. **Philadelphus grandiflorus plenus.,** Hort.—A double flowered variety of **Philadelphus grandiflorus.** Winter-killed at Brookings.

Philadelphus grandiflorus speciosissimus, Hort.—"Height four feet. Kills back severely, but is a free bloomer." N. E. Hansen (9).

Philadelphus grandiflorus.—Found in Bailey's Standard Cyclopedia of Horticulture (2) under No. 6, 9, 18, 21, 22.

No. 6. **Philadelphus grandiflorus,** Hort.—Under **Philadelphus floribundus.**

Fig. 4.—PHILADELPHUS LAXUS (Philadelphus speciosus)
One of the most desirable species of Mock Orange

No. 18. **Philadelphus grandiflorus,** P. W. Watson. Under **Philadelphus pubescens,** Loisel. "Under which name is is often met with, a name commonly also applied to varieties of **Philadelphus coronarius** and **Philadelphus inodorus, Philadelphus nivalis,** and many other species or supposed species. It is also wrongly called **Philadelphus Gordonianus."**

No. 21. Philadelphus grandiflorus, Gray.—**(P. grandiflorus,** Willd. **P. laxus,** Lindl., also of Lodd. **P. laxus var. grandiflorus,** Loud.) Under **Philadelphus inodorus,** Linnaeus.

No. 22. Philadelphus grandiflorus var. **laxus,** Torr. & Gray. Under **Philadelphus laxus,** Schrad.

Hairy Mock Orange

Philadelphus hirsutus.

Philadelphus hirsutus, Nutt. Philadelphus Godohokeri, Kirchm.

This plant was received as **Philadelphus Godohokeri,** Hort. A striking shrub about 8 feet in height, with small scentless flowers, the earliest to

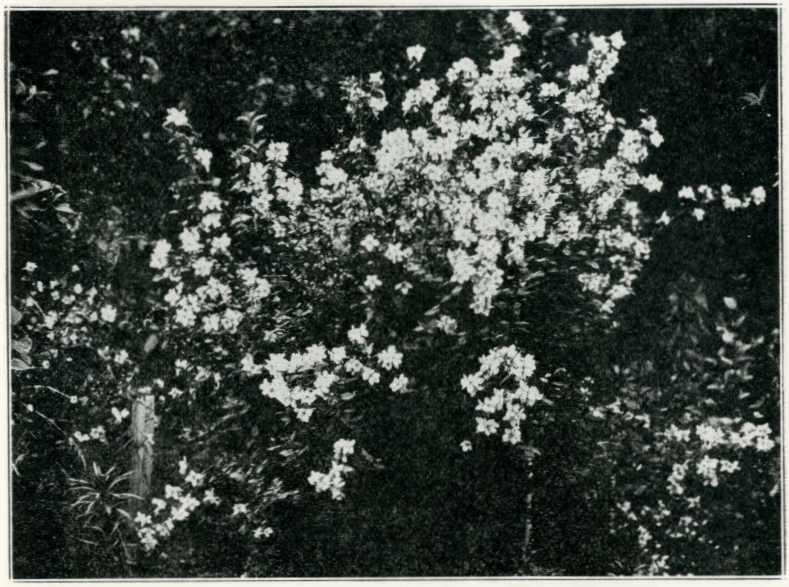

Fig. 5.—PHILADELPHUS LEMOINEI—LEMOINE MOCK ORANGE
The many hybrid varieties of Mock Orange produced by Lemoine of France are triumphs of the plant-breeder's art. The bloom is beautiful and abundant

bloom. Native of North Carolina and Tennessee to Georgia and Alabama. Winter-killed at Brookings.

Philadelphus involucrata.—A plant imported under this name killed to the ground and did not flower at Brookings; too tender.

Philadelphus Keteleeri flore pleno.—According to Dippel this is a double-flowered form of **Philadelphus coronarius.** Winter-killed at Brookings.

"**Philadelphus latifolius verrucosus,** Hort.—Kills nearly to the ground; too tender." N. E. Hansen (9).

Philadelphus pubescens Rafinesquianus, Musk.—Height 2 feet. Kills to the ground, sprouts weak. Too tender." N. E. Hansen (9).

Drooping Mock Orange

Philadelphus laxus.

Philadelphus laxus, Schrad. Philadelphus grandiflorus var. laxus, Torr. & Gray. Philadelphus speciosus Schrad. Philadelphus undulatus Kirchn.

A shrub 1½ to 5 feet in height; flowers white, scentless. Native of Georgia. Winter-killed at Brookings.

Philadelphus undulatus, Hort.

"**Philadelphus laxus,** Schrad, is given priority in Bailey's Cyclopedia. Native from South Carolina to Tennessee and Florida. Height 4 feet. Kills back, but has many strong sprouts. No flowers this year." N. E. Hansen (9).

Philadelphus Lemoinei, Hort.—Under the name **Philadelphus Lemoinei** is classified a very large number of choice ornamental shrubs originated through a series of years by Mr. Lemoine of Nancy, France, beginning about 1883. They are hybrids between **microphyllus** and **coronarius.** According to W. J. Bean in "Trees and Shrubs Hardy in the British Isles" "it represents one of the greatest successes ever achieved by the hybridiser's art, being the forerunner in gardens of a new and distinct type of Philadelphus, and the first of a most beautiful race of summer-flowering shrubs."

The best available classification of these hybrids is found in the "Manual of Cultivated Trees and Shrubs" by Alfred Rehder (22). According to Rehder the following horticultural varieties belong here: Avalanche, Boule d'argent, Candelabre, Erectus, Manteau d'hermine, and Mont Blanc. All of these except Candelabre have been tested at Brookings but not sufficiently to give a final judgment. They need a sheltered place; all are very handsome shrubs with rather small leaves and very fragrant flowers produced in great profusion. In later years Lemoine has produced a large number of other varieties by crossing **Philadelphus Lemoinei** with other species and hybrids.

W. J. Bean (5) recommends a special system of pruning to get the most blossoms. The flowers are produced on the one year old shoots; these should be cut clean to the ground as soon as the flowers are past. These will provide the following year's crop of blossoms, and if there are too many shoots from the ground to develop properly they should be thinned. This method of pruning gives enormous quantities of flowers and keeps the plants about 3 feet high, whereas if left to grow without pruning they might grow too tall.

Philadelphus Lemoinei erectus, Lemoine.—"A hybrid of **Philadelphus coronarius** and **Philadelphus microphyllus** produced by Lemoine of France in 1884. Height 4 feet, upright compact habit, slender branches, small delicate foliage. The fragrant snowy white flowers appear in early July. A graceful shrub which kills at the tips but is worthy of cultivation, especially if a sheltered place can be given." N. E. Hansen (9).

History of the Lemoine Philadelphus Hybrids

The following correspondence will be of special interest in this connection:

South Dakota State College
Brookings, South Dakota
February 23, 1921

Dr. Chas. C. Sargent,
Director of Arnold Arboretum,
Jamaica Plain, Mass.

Dear Dr. Sargent:

I understand you sent the original plants of native North American species of Philadelphus used by Lemoine in his hybridizing experiments. If your records show just where this native material was collected it will be a great help to me to get this information. I am interested in this genus.

Very truly yours,
N. E. Hansen,
Professor of Horticulture

ARNOLD ARBORETUM, HARVARD UNIVERSITY
Jamaica Plain, Mass.

February 26, 1921

Dear Professor Hansen:

The only Philadelphus which I have sent to Lemoine was Philadelphus microphyllus with which he made his first Lemoinei cross. Philadelphus microphyllus was first raised at the Arboretum in 1877 from seeds received from T. G. Brandegee living at that time at Canyon City, Colorado, and I take it for granted that the seed was gathered in the neighborhood of that town.

With kind regards, I am,

Faithfully yours,
C. S. Sargent.

Lewis Mock Orange

Philadelphus Lewisi.

Philadelphus Lewisii, Pursh. **Philadelphus columbianus**, Koehne. **Philadelphus Gordonianus**, Lindl. **Philadelphus californicua**, Benth. **Philadelphus cordifolius**, Lange.

The state flower of Idaho, J. E. Kirkwood (29).

"An upright shrub, to 8 feet, very variable * * * flowers white, borne in great profusion, in wild plants very fragrant, but, judging by some printed statements, not always retaining the odor under cultivation." L. H. Bailey (2).

"Philadelphus Lewisii, Pursh. is one of the most elegant and floriferous of all the taller species."—**Philadelphus Gordonianus**, Lindley, "appears to

be scarcely distinguishable from this species, but has larger flowers, 1½ to 1¾ inches across." W. J. Bean (5).

"**Philadelphus Columbianus,** Koehne. Native of north California, Washington and British Columbia. This is referred to **Philadelphus Gordonianus** by Dippel. Height one foot; too tender, killing to the ground every winter." N. E. Hansen (9).

One lot of **Philadelphus Lewisi** plants winter-killed at Brookings.

Littleleaf Mock Orange

Philadelphus microphyllus.

Philadelphus microphyllus, A. Gray.

A graceful shrub of upright compact habit, 4 to 6 feet high; flowers abundant, of exquisite strong pineapple-like fragrance. One of the best species of Philadelphus for small gardens. In the hands of Lemoine, of France, this has become the ancestor of the large number of beautiful hybrid varieties of which **Philadelphus Lemoinei** was the first to appear. At Brookings this formed a dense bush 4 feet in height, but did not prove hardy.

Philadelphus microphyllus is a native species extending from Utah and Colorado to Arizona, New Mexico, and California (2).

Philadelphus monstrosus, Rehder.—Philadelphus Gordonianus monstrosus, Hort. A hybrid **(P. Gordonianus x pubescens),** origin unknown. A tall shrub with branchlets nearly glaborous; flowers white, scentless.

"Height now 5 feet. Kills back considerably but is a free bloomer." N. E. Hansen (9).

Peking Mock Orange

Philadelphus Pekinensis.

Philadelphus pekinensis, Rupr. Philadelphus coronarius var. pekinensis, Maxim. Philadelphus rubricaulis, Carr.

A shrub with creamy white slightly fragrant flowers; smooth leaves with purplish stalks, smooth flower stalks.

"**Philadelphus pekinensis,** Rupr.—Native of Mongolia and north China. A bush 3 feet in height, forming a dense mass of small-leaved shoots. Kills back one-third or more and hence a shy bloomer. Flowers yellowish white, somewhat fragrant." N. E. Hansen (9).

These bushes are now about 16 feet in height and 16 feet across; of very strong upright growth. Native of north China, Mongolia and Korea.

Hoary Mock Orange

Philadelphus pubescens.

Philadelphus pubescens, Lois. Philadelphus, latifolius, Schrad. Philadelphus grandiflorus var. floribundus, Gray.

A shrub to 10 feet; leaves dull dark green and nearly smooth above, densely gray pubescent (hoary) beneath; flowers pure white, scentless or nearly so. Native from Tennessee to Alabama and Arkansas.

"It is a fine free-flowering shrub, not uncommon in gardens, distinguished chiefly by the year-old wood not peeling, the numerous flowers in each raceme, and the downy calyx. One of the finest and noblest of mock oranges." W. J. Bean (5).

"**Philadelphus latifolius,** Schrad.—Native of eastern United States.

Height 4½ feet; kills back severely but has many strong shoots and is a free bloomer." N. E. Hansen (9).

"**Philadelphus latifolius grandiflorus,** Schrad.—Philadelphus pubescens, Loisel is given priority in Bailey's Cyclopedia. Tennessee is named as the habitat. This bush kills back one-half or more, but sprouts strongly every year. Blossoms creamy white, not fragrant, appearing in late May and first half of June." N. E. Hansen (9).

These grew to be 13 feet high; very spreading habit, free bloomers.

"**Philadelphus latifolius sanguineus,** Musk.—Height 4 feet. Kills back considerably, but not enough to prevent it flowering a little. Flowers small, white and slightly fragrant." N. E. Hansen (9).

Souvenir de Billiard Mock Orange

Philadelphus insignis, Carr.

A hybrid variety (**Philadelphus pubescens x cordifolius** or **californicus?**), originated before 1870. An upright shrub; flowers in large panicles, slightly fragrant. One of the latest to bloom. Winter-killed at Brookings.

According to Bailey, "Standard Cyclopedia of Horticulture" (2), this is a horticultural variety of **Philadelphus pubescens,** Loisel, which is native of Tennessee and Alabama.

Satsumi Mock Orange

Philadelphus satsumanus.

Philadelphus satsumanus, Miq. Philadelphus satsumi, Koehne, not Lindl. & Baxt. Philadelphus acuminatus, Lange.

"**Philadelphus satsumi acuminatus,** Lange. Native of China, Japan and the Himalayas. Height 3 feet; kills back severely. No flowers observed. Too tender." N. E. Hansen (9).

An erect shrub to 6 feet. Flowers slightly scented, white. Winter-killed at Brookings.

Schrenk Mock Orange

Philadelphus schrenki.

Philadelphus Schrenki, Rupr.

"Native of China, Japan and the Himalayas. Referred to **Philadelphus coronarius Satsumi** by Dippel. Height three feet, kills nearly to the ground; too tender." N. E. Hansen (9).

Leaves very large and thin; branchlets more or less hairy; flowers scentless. "Very near **Philadelphus tenuifolius,** Rupr., and Maxim, but of more vigorous and upright habit. * * * Native of the Diamond mountains, Korea." Alfred Rehder (22).

Philadelphus verrucosus, Schrad, var. **pendulifolius.** — Philadelphus pendulifolius, Carr. A garden variety with slightly drooping branchlets. Winter-killed at Brookings.

Philadelphus No. 144 Voronezh.—Imported by Professor J. L. Budd, Iowa State college, from Russia, under the name **Philadelphus No. 144** Voronezh. The plants are hardy, of strong, upright growth, 12 feet high; free bloomers. Botanical status not determined.

Philadelphus Zeyheri, Schrader

Philadelphus coronarius Zeyheri, K. Koch.
Philadelphus Satsumanus, Sieb.

A hybrid of uncertain origin, but probably **Philadelphus coronarius x inodorus** or **grandiflorus.** A shrub of vigorous spreading habit, to 8 feet in height; originated about 1820. The pure white flowers have little or no fragrance, not as free a bloomer as many of the other species.

"Height 4 feet. Kills back one-half or more every winter, but produces a few flowers every year." N. E. Hansen (9).

Chinese Christmas Berry

Chinese-hawthorn

Photinia villosa.
Photinia villosa, Lindl. P. villosa, DC. P. variabilis, Hemsl. Pourthiaea villosa Decne. Sorbus terminalis, Hort.

No common name is given in Standardized Plant Names. An upright shrub, attains 15 feet in height. Native of Japan, Korea, and China. The thick dark green leaves are smooth above, somewhat hairy beneath when young and turn red and yellow in autumn.

"Large shrub with a profusion of white flowers in May and clusters of holly-like red berries in the autumn persisting nearly all winter, gorgeous autumn foliage. Hardy." G. B. Tuthill, Sioux Falls, 1931.

Western Ninebark

Physocarpus monogynus.
Physocarpus monogynus, Coult. Physocarpus Torreyi S. Wats. Spiraea monogyna, Torr. Neillia Torreyi, Wats. Opulaster monogynus, Kuntze.

A neat small shrub 3 feet in height; native of South Dakota and Wyoming, to Texas and New Mexico. Leaves small, resembling those of Alpine currant; flowers small, white often pinkish, in dense umbels; seed pods inflated; ornamental.

"Western Ninebark (**Opulaster monogynus,** Torr.) A small shrub with finely pubescent leaves, having fruit and bark coming off in shreds. This would be valuable for cultivation. It is the **Physocarpus Torreyi** of Coul**er's** Manual. Plentiful along the steep side of canyons in the Black Hills." Thomas A. Williams (28).

"In the Black Hills and the adjacent plains." D. A. Saunders (26).

Common Ninebark

Physocarpus opulifolius.
Physocarpus opulifolius, Maxim. Spiraea opulifolia, Linnaeus. Opulaster opulifolius, Kuntz. Neillia opulifolius, Brew. & Wats.

A shrub to 10 feet, native from Quebec to Manitoba, south to Kansas and Tennessee and Georgia.

"**Spiraea opulifolia,** Linn. Nine-bark. Dippel gives preference to the name **Physocarpus opulifolia,** Rafin. A native of North America, ranging from Canada to Florida and westward to the Pacific slope. Our specimen was imported from Germany and kills back severely in the winter; it is

probably not the form found native in this state. The attractive white blossoms the latter part of June are followed by inflated red capsules." N. E. Hansen (9).

"Ninebark (**Opulaster opulifolius** [L.] Kunze). Somewhat like the last, (**O. monogymous, Tor.**) but larger throughout, with smoother leaves and fruit and longer flower stalks. Often found in cultivation. This is **Physocarpus opulifolius** of Gray's Manual. Black Hills." Thomas A. Williams (28).

"**Opulaster opulifolius**, (L.) Kuntze. Ninebark. Common in the Black Hills." D. A. Saunders (26).

The wide geographical range of the Common Ninebark suggests care in selecting plants. To insure getting a hardy shrub, South Dakota planters should plant the Common Ninebark as found native in South Dakota and Minnesota, and avoid the form native to the East or South.

Goldleaf Ninebark

Physocarpus opulifolius luteus.
Physocarpus opulifolius var. luteus, Zabel. Spiraea opulifolius lutea, Kirchn. Physocarpus opulifolius var, aureus, Hort.

A variety of the Common Ninebark, with beautiful golden yellow leaves at first, later changing to bronzy yellow. This is hardy at Brookings, but the bright gold color does not persist through the season.

Friedrichsen Cinquefoil

Potentilla Friedrichseni.
Potentilla Friedrichsenii, Spaeth. Potentilla fruticosa var. Friedrichsenii, Rehder.

Sent out from the Spaeth nursery in Berlin in 1897 as a hybrid between **Potentilla fruticosa** and **Potentilla davurica.** Height to 6 feet; more vigorous than **Potentilla fruticosa.** Leaflets rather large, pubescent; flowers light yellow. Hardy.

Dwarf Ninebark

Physocarpus opulifolius nana.
Spiraea opulifolius nana, Kirch. Physocarpus Opulifolius var. nana, Zabel.

A dwarf shrub with smaller, less deeply lobed and dark green leaves. Originated before 1864 (22).

"Dwarf form, dense grower. Very attractive foliage followed by numerous small red pods. A valuable hardy low growing shrub." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Shrubby Cinquefoil

Potentilla fruticosa.
Potentilla fruticosa, Linnaeus.

"**Potentilla fruticosa,** Linn. Shrubby Cinquefoil or Five-finger. This shrub is somewhat cosmopolitan, being a native of northern North America, central Europe and Siberia. A low, much branched bush three feet in height with grayish-green silky compound leaves. The bright yellow flowers appear all summer, beginning the last of May. Professor Williams found it abundant along the sides of canyons in the Black Hills. A useful

shrub for large collections, but not especially desirable for small ones." N. E. Hansen (9).

"Shrubby Cinquefoil (**Potentilla fruticosa**, L.) A small, erect, much branched shrub with silky, compound leaves and yellow flowers. A handsome shrub in cultivation. Abundant along sides of canyons in the Black Hills." Thomas A. Williams (28).

A large number of varieties of the Shrubby Cinquefoil have originated under cultivation. A useful shrub because it flowers after many other shrubs, and continues till frost.

Potentilla fruticosa var. **micranda**, Schneid.—Potentilla fruticosa car. micranda, Koehne. Of lower spreading habit, with border leaflets; flowers yellow with stamens shorter than the pistils. Hardy.

Cherry Prinsepia

Prinsepia sinensis.
Prinsepia sinensis, Oliver. Plagiospermum sinensis, Oliver.

Most members of the Rosaceae or Rose family have solid pith but Prinsepia has its pith chambered (divided into thin plates) or finally excavated.

Prinsepia (named after Macaire-Prinsep, botanist at Geneva, Switzerland), belongs to the subfamily Pruneae, which includes the plums and cherries. There are three species on the Himalayas and in northeastern Asia to northwestern China. The fruits are red and juicy, resembling a small plum. It was first described from dry material in 1886 as Plagiospermum, but when fruit became available it was found to belong to Prinsepia. In 1908 the plant first reached England.

The plants at Brookings were selected in 1906 by the writer, in the Regel & Kesselring Nursery at St. Petersburg (now Leningrad), Russia, where they had just been received from Manchuria. These plants are now 10 feet in height and 8 feet across, forming a mass of slender spiny branches. Leaves bright green, ablong lanceolate; fruit red and juicy, acid, with a large flat pit; flowers light yellow, appearing in abundance in early spring. This early period of bloom may account for the shy bearing; perhaps there is a lack of insects for pollination at that early season. The plants are hardy at Brookings. The extremely thorny branches would make it useful as an impenetrable hedge, but scarcely desirable for individual specimens on the lawn. The fruit is edible.

"The shrubs have proved perfectly hardy at the Arnold Arboretum only the flowers suffer sometimes during cold weather; they are among the earliest shrubs to burst into leaf and are conspicuous by their bright green foliage when most other shrubs are still bare. They seem to grow best in a sunny and open position and in well-drained soil. Alfred Rehder (2).

Prinsepia sinensis Oliver.—"Valued for its early appearing bright green leaves; flowers not very conspicuous." Alfred Rehder (2).

In 1924, in the search for hardy pears in north Manchuria, Prinsepia sinensis was found by the writer to be quite abundant in the open timber in the mountains about 50 miles east of Harbin.

Bessey Cherry
Western Sand Cherry
Hansen Select Bush Cherry

Prunus Besseyi.

Prunus Besseyi, Bailey. Prunus pumila var, Besseyi, Waugh. Prunus prunella, Daniels. Prunus Rosebulii, Regan.

My work at the South Dakota Experiment Station with the South Dakota Sand Cherry, Bessey Cherry, was begun in 1895 and during the 34 succeeding years over 300,000 seedlings have been grown. During the past season, 1929, the work of selections was with 60,000 seedlings at the State Orchard at Watertown and 1700 at Philip. The work of the early years is described in "The Western Sand Cherry" by N. E. Hansen, Bulletin 87, June, 1904, South Dakota Experiment station.

The greatest success has been with my bybrids of Sand Cherry and Japanese Plum, such as Opata and Sapa, which are now largely grown in many western states from Texas north into Canada. These are described in South Dakota Bulletin 224. The plan is to fix the type of these select seedlings so they will breed to seed and thus avoid the present necessity of budding them on native plum stocks. The average size of the fruit has been much increased. The seedlings and fruit have greatly improved in quality. The size of the pit has been greatly reduced by selection.

During the preceding four years, 1891–1895, it was my privilege to work with several thousand Sand Cherries at the Iowa State Experiment station under the direction of Professor J. L. Budd. The Sand Cherry was on trial as a stock for various stone fruits, but the seedlings were also gone over and selected for fruit.

"Prunus Besseyi, Bailey.—Eight plants received from Arnold Arboretum and planted during the spring of 1899 are now three feet high and are full of fruit this year. This is the western Sand Cherry found native from Kansas to Manitoba and west to Utah and Colorado. We have grown many thousand seedlings of this species, as received from northern Nebraska and various parts of the Dakotas, with a view to improving the fruit in size and quality, and the results, so far, give us reason to believe that we will soon have varieties worthy of general cultivation. Meanwhile the plant is very worthy of cultivation as an ornamental shrub. The "Improved Rocky Mountain Cherries" are Colorado seedlings of this species. Plants received from Valentine, Nebraska, near the South Dakota line, and set in the spring of 1897 in a row three to four feet apart now form a hedge four feet high, nine feet across and twenty-five feet long. The abundant white blossoms appear in early May, and are followed by black fruit about one-half inch in diameter, ripening late in July to early in August. None of these is, however, equal in quality to our second generation seedling from the same source, some of which bore fruit for the first time this year, the seed having been saved from the best of 5,000 seedlings fruited on the station grounds in 1898 and planted in the spring of 1899. The handsome glossy foliage and white flowers give this plant decided value as an ornamental shrub and for this can be planted in hedge row or among other shrubs, but for the purpose of raising the largest amount of fruit, it would probably be best to set the plants further apart,—4 by 6 feet. At present one of our main lines of work is the improving of our native Sand Cherry. The many points of difference from the eastern form would

seem to entitle it to specific rank, P Besseyi. Bailey's Cyclopedia refers it to **P. pumila**, var. Besseyi, Waugh, with the statement: "In its extreme form this plant looks to be distinct, but it seems to intergrade imperceptibly into **P. pumila**." N. E. Hansen (9).

"Sand Cherry (**Prunus pumila**, L.) A low shrub with narrow toothed leaves which are pale beneath. The fruit varies a great deal in size, color and taste. It is usually dark red or purplish black and pleasant to the taste. At Pineau Hills a form occurs with very large purple-black fruits in which the astringent taste is almost entirely wanting. A yellowish fruited form is growing on the college grounds. Mr. Rydberg reports a sand cherry with fruits nearly an inch in diameter from the foot-hills of the Black Hills region. It is possible that more than one species occurs within the state." Thomas A. Williams (28).

"On bluffs and banks of streams from the James valley westward." D. A. Saunders (26).

Rehder classifies the Cistena as follows:

Purpleleaf Sand Cherry

Prunus cistena, N. E. Hansen.
Prunus pumila x cerasifera Pissardii.

"Leaves slightly pubescent along the midrib beneath near base, reddish like pedicels and calyx: petiole puberulous above; flowers 1–2, white; fruit blackish purple." Alfred Rehder, Manual of Cultivated Trees and Shrubs (22).

"Cistena Purpleleaf Sand Cherry Hybrid. Introduced spring of 1909 as Purple A. Female parent, Dakota Sand Cherry; male parent, the Purple-leaved plum of Persia, **Prunus Pissardi**. A beautiful shrub, following the Sand Cherry in stature of plant and glossiness of leaf, but the foliage has the rich purple-red color which gives its Persian sire such wide popularity." N. E. Hansen, Bulletin 224.

"Stanapa Purple-leaf Sand Cherry Hybrid. Introduced 1909. Sand Cherry x Purple-leaved Persian plum pollen. An event for landscape gardens. By crossing the Dakota sand cherry with pollen of the Purple-leaved plum of Persia (**Prunus Pissardi**), we have a number of beautiful shrubs following the sand cherry in stature and glossiness of leaf, but with the rich purple-red of foliage which gives the Persian sire such wide popularity. In the spring of 1909, three of these seedlings were first introduced as Purple A. Purple B. and Purple C. Last year (1910) Purple A was named Cistena (Sioux Indian name for 'baby'). Further experience shows that Purple B is also worthy a name since the color is as bright and the growth equal if not superior. The name now given to Purple B is Stanapa, which is made up from two Sioux Indian words meaning "purple leaf.." These purple-leaved sand cherries will probably win great favor for single specimens or groups on the lawn or for dwarf ornamental hedges, owing to their brilliant coloring." N. E. Hansen (9).

Cistena: "This is about the only hardy shrub that has the bright colored leaves the entire season. They are used extensively in landscape planting and will lend color to any grouping. The leaves are a bright purplish red." D. B. Gurney, Yankton, S. D., 1929.

Dwarf Red or Purple Leafed Sand Cherry

"Prunus Cistena is the most unique and outstanding of all shrubs introduced by Prof. N. E. Hansen of South Dakota State college. The glossy orilliant purplish red foliage, showy wine colored blossoms and fruit, and low compact habit of growth, together with absolute hardiness makes this the finest and most dependable of all low growing red or purple leaf shrubs. Its rich color tones are invaluable for landscape and foundation plantings." G. B. Tuthill, 1931, Sioux Falls, South Dakota.

Flowering Almond

Prunus glandulosa.

Prunus glandulosa, Thunberg, is a very ornamental shrub, 4 to 5 feet high, native of central and north China, and Japan. Thunberg described the species in his Flora Japonica, 1784.

Double-flowered varieties of Prunus glandulosa are known as Flowering Almond, according to Standardized Plant Names (1). Prunus glandulosa is a common "flowering almond" of American gardens. According to Bailey, it was long confused with Prunus Japonica, but differs markedly in the foliage. There are many forms in cultivation. The two most common forms are noted in Standardized Plant Names (1) as Double Pinkflowering Almond and Double Whiteflowering Almond.

"Native of central and northern China and Japan. The form in cultivation in the state is the one with double flowers (f. sinensis Koehne). It is a handsome ornamental shrub and is reasonably hardy but does best with a slight covering during the winter. Blossoms in April or early May." Rosendahl and Butters (23).

Double Pinkflowering Almond

Prunus glandulosa, Thunb.

Prunus glandulosa, var. sinensis, Koehne. Prunus japonica flore roseo pleno, Hort. Prunus sinensis, Pers.

Native of east Asia. In cultivation since 1687.

Double Whiteflowering Almond

Prunus glandulosa, Thunb. var. **albo-plena.**

Cerasus japonica, var. multiplex, Ser. Prunus japonica flore albo-plena, Lem.

Flowers double, white. Introduced about 1855.

Chinese Bush Cherry

Prunus Japonica.

Prunus Japonica, Thunb. Prunus nana, Hort., in part. Prunus sinensis, Hort., of American gardens.

A dwarf bush of neat rounded habit. The double-flowered varieties are forced under glass in winter. **Prunus Japonica** has fruited several times at Brookings. The fruit is one-half inch in diameter, smooth, shiny, red; pit free from the flesh; of no value for fruit.

"**Prunus Japonica,** Thunb. (**Amygdalus pumila,** Sima.) Flowering Almond. Native to central China, Japan and southern Manchuria. These kill

back severely at Brookings and should be given winter protection. A Minnesota nurseryman reports good results from budding this and other small ornamental species of Prunus upon Prunus Besseyi stocks." N. E. Hansen (9).

Sand Cherry

Prunus pumila.

Prunus pumila, Linneaus.

"**Prunus pumila**, Linn. Sand Cherry, Dwarf Cherry. Native of North America from New Brunswick south to Virginia, west to Minnesota and Kansas. Six specimens marked "from near Lake Michigan" received from Arnold Arboretum and planted in the spring of 1899 are now 4 to 6 feet high and some are bearing fruit, but the plants winter-kill severely. Five plants marked "New England variety" are three feet high and hardy, are bearing fruit this year but it is small and very inferior. For South Dakota it is evident that the western Sand Cherry is more desirable than the eastern Sand Cherry." N. E. Hansen (9).

Sand or Dwarf Cherry

Prunus pumila.

"A shrub prostrate and spreading, or ascending—much branched from the base, with a height of 6 inches to 6 feet. Leaves, oblanceolate or spatulate, are acute at the apex and narrowed at the base, serrate, deep green above but pale beneath. The white flowers appear with the leaves in sessile lateral umbels. The clusters are few-flowered. The dark red or nearly black drupe is one-third to one-half inch in diameter, ripens in August and is without bloom. The thin flesh is sour.

"Its habitat is sandy or gravelly shores and does not come much farther than the eastern border of the province.

"It is with **P. Besseyi** that most of our ventures with cherries are likely to be undertaken. The fruit on shorter, thicker peduncles is nearly twice as large as that of the **P. Pumila** and is often bitterish and astringent while that of the dwarf cherry is sour." W. R. Leslie (17).

Nanking Cherry

Prunus tomentosa.

Prunus tomentosa, Thunberg. Cerasus tomentosa, Wall. Prunus trichocarpa, Bg.

A spreading shrub 10 to 12 feet in height. Native of north and west China, Japan and the Himalayas.

"**Prunus tomentosa**, Thunb. Native of northern China and Manchuria. A specimen from Arnold Arboretum planted in the spring of 1899 has proved hardy and is now four feet in height. A shrub of neat habit with shoots thickly set with pubescent leaves. This year the large crop of pinkish blossoms appeared early in May. At Kuldja, in western China the writer saw this species in cultivation in the fall of 1897 and the red cherry-like fruit was said to be edible and desirable. The fruit as sampled in the botanic gardens in Hamburg, Germany, early in July of the same year was too small to be of much value. It may prove of value in plant-breeding work and its distinct foliage and dense habit make it worthy of a place among small ornamental trees." N. E. Hansen (9).

Recent experiments indicate that this species can be improved in size

and quality of fruit. So far as we have been able to get plants at Brookings this species has lacked in hardiness and fruitfulness.

"The habitat of **Prunus tomentosa** is probably Central Asia though it is now to be found growing spontaneously in east Tibet and the Chinese provinces of Setschuan, Hupe, Kansu and perhaps Tochlii.

"This shrub-like cherry is very generally cultivated in central eastern and northern China and in Japan for its fruit and as an ornamental. It has been introduced into cultivation in many widely separated places in North America and appears to be promising for cold regions, both bud and wood withstanding perfectly the most rigorous climates of the United States. As it grows in America it is a bush and never a true tree. * * * The flowers appear in great abundance with the leaves, making a handsome ornamental; they are white, becoming rose-colored as they fall away. The fruit ripens in mid-season for cherries, setting profusely from the many blossoms. The cherries are a half-inch in diameter, bright currant-red, covered with inconspicuous hairs and contain a stone of medium size. They are pleasantly acid, very juicy and withal a decided addition to cultivated cherries. **Prunus tomentosa** seems a most promising plant for domestication and of particular merit for small gardens and cold regions." U. P. Hedrick, in "The Cherries of New York," 1915, (32).

Bean calls this species the Downy Cherry. The Latin "tomentosa" refers to the close down or hairy felt on the young branches.

Flowering Plum

Prunus triloba.

Prunus triloba, Lindley. Amygdalus triloba. Amygdalopsis Lindleyi, Carriere. Amygdalus pedunculata, Bunge. Prunopsis Lindleyi, Andre. Prunus ulmifolia, Franch.

A most desirable ornamental shrub, usually called Flowering Almond. Native of China. According to Bailey (2) **Prunus triloba** "sometimes rises to the stature of a small tree. The double-flowered form (var. plena) is the one commonly seen in grounds, but the single-flowered form is the better."

Winter-killed at Brookings.

Prunus triloba.— Clarence Wedge, Albert Lea, Minnesota, visiting George W. Strand, Taylor's Falls, Minnesota, a few years ago, wrote as follows in The Farmer, St. Paul, Minnesota:

"One of the first things that we discussed was the value of the **Prunus triloba** for our state. This shrub is so much like the common flowering almond that most people take it to be that old-fashioned flower. But it is quite superior in several ways. It blooms about a week earlier, the individual flowers are larger, and it has a very pleasant plum blossom fragrance, while the almond is altogether without scent. In the latter part of the season its foliage is also more pleasing and abundant.

"With Mr. Strand the **Prunus triloba** has been a free bloomer, while with us a hundred and fifty miles farther south, it has frequently failed to bloom. We found it hard to understand why this should be so, but concluded that it must be a matter of soil or particular location. A warm sunny place always tends to ripen both fruit and wood, and where wood is well ripened, blossom buds are much more certain to open up perfectly. It is probably the earliest of all our shrubs to bloom, and on this account has great value everywhere it can be grown. By planting in southern exposures and where the soil is warm and not too rich, it will probably be-

have its best, and become one of the prime favorites of our climate. We advise our people to make a trial of at least one of these interesting shrubs."

Doubleflowering Plum

Prunus triloba plena.

Prunus triloba plena, Dippel. Prunus triloba flore plena, Hort.

"Native in eastern and central Asia. A double flowered plum. Of five specimens from Arnold Arboretum planted spring of 1899, four winter-killed, but one is alive. It is now 3 feet high, but killed back severely." N. E. Hansen (9).

The very attractive pink flowers were not freely produced.

Lindley founded this name **Prunus triloba,** upon this double-flowered variety which was introduced from China by Fortune in 1855. The flowers are 1½ inches across, clear delicate rose-pink; very double. Much used in England for forcing for early bloom under glass.

"Native of China. The commonly cultivated form is the one with double flowers (f. plena Dipp.). It is entirely hardy in our climate but is not as free-flowering as the following species **(Prunus glandulosa,** Thunb.). Flowers in May." Rosendahl & Butters (23).

Common Buckthorn

Rhamnus cathartica.

Rhamnus cathartica, Linnaeus.

"**Rhamnus cathartica,** Linn. Buckthorn. Native of Europe, Siberia, western and northern Asia. One of the best plants for ornamental hedges. The ovate dark green leaves are attractive throughout the season; flowers small and inconspicuous; branches thorny. The black fruits are the size of a pea. A hedge ten rods long started on the station grounds from small seedlings in the spring of 1896, has proved perfectly hardy. It was dwarfed at first by a hedge of Golden Currant, in the adjoining row, but is now 9 feet high and very dense. On George H. Whiting's grounds at Yankton, there is a fine Buckthorn hedge which is kept trimmed square on top. John H. Miller, of Huron, has a fine Buckthorn hedge. Under date of August 22, 1899, Mr. Miller writes:

" 'Complying with your request of the 15th inst., regarding a history of my Buckthorn hedge, would say that I first set the hedge from two-year old seedlings about ten or twelve years ago. Its size now as trimmed is 6 feet high, 4 feet wide and about 50 feet long. It is very thick and close so that a robin cannot (not directly) fly through it. I have kept it trimmed back every year, otherwise it would have grown 20 or more feet high. It is a rapid grower and after the first two years from setting is as hardy as an oak. The coldest weather does not affect it or kill it back a particle. Will also stand hot dry weather as well as cold. It is the best substantial hedge for all climates and purposes that I know of, and I have tried and am acquainted with several other varieties of hedge plants and have found none equal to this. It will not grow from cuttings, is propagated from seeds which ripen in the fall.' " N. E. Hansen (9).

The hedge of Common Buckthorn at this station planted (as noted in South Dakota Bulletin 72) in the spring of 1896, was 25 feet in height at the time of its removal in 1929. The photograph shows this hedge that has

been grown without pruning. The leaves remain green until late in the autumn. Both foliage and the abundant crop of small black fruit, one-fourth inch across, are ornamental. The Common Buckthorn is hardy, but is now but little planted in the prairie Northwest, because it carries one stage of the crown rust of oats. Canada now bars importations of Common Buckthorn.

"A genus of about 75 species, native of temperate and warm regions. Five of these occur in the eastern and six in the western parts of North America. The species of this genus, and particularly the European ones, are the alternate hosts for the oat rust, **Puccinea coronata.** It is therefore inadvisable to plant oats in the vicinity of buckthorn hedges, and where oats are an important crop, the planting of buckthorn should be discouraged." Trees and Shrubs of Minnesota, Rosendahl and Butters (23).

S. M. Dietz, Assistant Pathologist, United States Department of Agriculture, presents the results of 6 years studies at Iowa Agricultural Experiment station, in his paper "The Alternate Hosts of Crown Rust, **Puccinia Coronata Corda**" Journal of Agricultural Research, No. 10, 1926.. The following is from the summary on page 969: "During the past nine years in Iowa, aecial infection has appeared on **Rhamnus cathartica** and **Rhamnus lanceolata** previous to the development of uredinia on Avena sativa. These two species of **Rhamnus** have been instrumental in starting local and general epidemics in Iowa within the past two years." (**Avena sativa** is the botanical name for oats.)

"**Rhamnus cathartica,** often used as a hedge plant, is a native of northern Asia. When planted as a specimen shrub it grows to be ten or twelve feet, and has very dark and thick foliage. It forms a fine dark background for lighter colored and smaller shrubs. It fruits heavily and the birds carry the seeds long distances. The seeds grow as readily as the seeds of red-berried elder. It is spreading naturally in our wooded part at Montevideo." L. R. Moyer, Montevideo, Minnesota (18).

"**Rhamnus cathartica L.** Buckthorn. Frequently cultivated and used as a hedge plant. The ripe fruit is said to be poisonous. It contains the glucosides rhamnin, rhamnetin, and rhamnocathartin." L. H. Pammel, Manual of Poisonous Plants (20).

Dahurian Buckthorn

Rhamnus dahurica.

Rhamnus dahurica, Pall. Rhamnus davurica, Pall. Rhamnus cathartica, var. dahurica, Maxim.

Hardy at Brookings, three plants growing to 18 feet high and 18 feet across.

"Native of Siberia, Manchuria, and north China, very closely allied to **Rhamnus cathartica.** It does not differ from that species in flower or fruit, but its leaves are longer, uniformly wedge-shaped at the base, and with one or two more pairs of veins. Of little garden value except in rough shrubberies." W. J. Bean (5).

Glossy Buckthorn

Rhamnus frangula.

Rhamnus frangula, Linnaeus. Frangula Alnus, Mill. Frangula Frangula, Karst.

Also called Alder Buckthorn. A handsome shrub or small tree, native of Europe, north Africa, western Asia, and Siberia. **Foliage shining; ber-**

ries attractive, purplish-black. Our specimens attained the height of 21 feet. Hardy.

Rhamnus utilis, Decne.—Native of central and east China. A tall shrub of erect habit, with slender, smooth branches. The handsome light green smooth leaves perish late in the fall.

Rhododendron

"The cultivated Rhododendrons of eastern nurseries are conspicuous by their absence from northwestern nursery catalogs, owing to entire lack of hardiness." N. E. Hansen (9).

Rhododendrons are among the most highly ornamental of all shrubs both for flowers and foliage. There are more than 400 species of rhododerdrons distributed through the colder and temperate parts of the northern Hemisphere. Some are tropical and Australian. There are three horticultural groups: evergreen rhododendrons, hardy deciduous azaleas, and Indian azaleas. All rhododendrons do best in a peaty or porous loamy soil free from lime. The name comes from the Greek **rhodon**, rose, and **dendron**, tree.

Common Smoketree

Rhus cotinus.

Rhus cotinus, Linnaeus. **Cotinus coggygria**, Scopoli. **Cotinus Cotinus**, Sargent. **Cotinus coccygea**, K. Koch.

Native from middle and South Europe to central China and the Himalayas. A beautiful shrub. The inflorescense in loose panicales which develop into a large number of silken hairs, so that the whole plant is covered with a filmy cloud like clouds of smoke, at first pale pink, dull purple. Needs a good sheltered place to fruit at Brookings.

Several other popular names have been given to this plant, such as Venetian sumac, smoke plant, burning bush, and wig-tree. This shrub flowers best on poor soil. In very rich soil it grows too fast and gives little flower.

"Occasionally planted as an ornamental shrub on account of its conspicuous fruiting panicles. Moderately hardy in the Twin Cities." Rosendahl and Butters, Trees and Shrubs of Minnesota (23).

Smooth Sumac

Rhus glabra.

Rhus glabra, Linnaeus.

A handsome ornamental shrub, native from Maine to British Columbia, south to Florida and Arizona. The scarlet fruiting panicles and brilliant red foliage in autumn make this one of our best shrubs. The brilliant red masses of Sumac often seen in the Dakotas is one of the autumnal glories of the prairie landscape.

"Smooth Sumach (**Rhus glabra**, L.). A low or medium sized shrub growing on rather dry and rocky banks in the eastern part of the state. The leaves are sometimes used in tanning leather, and both leaves and fruit are of medicinal value." Thomas A. Williams (28).

"Common on bluffs and banks of streams from the Missouri valley eastward, and in the Black Hills." D. A. Saunders (26).

"Smooth Sumac (**Rhus glabra**). Occurs in the Black Hills and in the state east of the Missouri river. Other species are reported as occuring in the state." W. H. Over (19).

Noted at Big Bonanza Springs and Big Stone lake, Roberts county, South Dakota, by L. H. Pammel, 1917.

Cutleaf Sumac

Rhus glabra laciniata.
Rhus glabra, var. laciniata. Schmaltzia glabra, Small.

A cut-leaved variety of the Smooth Sumac. A very handsome shrub. Kills back somewhat so it is best for sheltered places.

"**Rhus glabra,** var. **laciniata.**—One of the handsomest of hardy foliage plants, the leaflets being deeply cut so as to make the leaf almost or quite doubly pinnate. Its greatest beauty is obtained by cutting it back hard every spring, and thinning down the young shoots to one or two, thus obtaining broad feathery leaves 3 feet long, very striking in their autumn colour." W. J. Bean (5).

Lemonade Sumac

Rhus trilobata.
Rhus trilobata, Nuttall.

Native of Illinois to Washington, California and Texas. An ornamental shrub from 3 to 5 feet high, with three-lobed leaves and red berries. Desirable for slopes and other dry places. "Ill-scented Sumac" is given as a common name in the Handbook of Cultivated Trees and Shrubs, Alfred Rehder (22).

"Low Sumach (**Rhus trilobata,** Nutt.). A low, straggling shrub with strong-smelling foliage. Dry banks. Common along the Missouri and to the westward." Thomas A. Williams (28).

"On dry bluffs and hills from the Missouri valley westward, common; many specimens have very pubescent leaflets." D. A. Saunders (26).

"A low shrub common on bleak hillsides over the western half of the state. This sumac is reported as not poisonous." W. H. Over (19).

Mountain Currant

Ribes alpinum.
Ribes alpinum, Linnaeus. Ribes opulifolium, Hort.

One of the hardiest and best shrubs for low hedges or as specimen shrubs. One good point is the late retention of the leaves in the fall. Native of the Alps of Europe. Leaves three-lobed, rarely five-lobed. Flowers dioecious, small greenish, in upright racemes. The female or pistillate fruiting form is sometimes distinguished as var. bacciferum, Loud., and the male or staminate form, not fruiting, as var. sterile, Loud.

"The Alpine currant is a desirable shrub of dense habit, unfolding very early its bright green foliage, adorned in summer and autumn with bright scarlet berries; it is one of the best shrubs to plant as undergrowth and in shady places." Alfred Rehder (2).

Ripes alpinum aureum

Ribes alpinum aureum.

Ribes alpinum, Linn. var. aureum, Bean. Ribes alpinum var. pumilum, Lindl. Ribes alpinum var. pumile, A. Braun. Ribes alpinum var. pumilum aureum, Pynaret. Ribes alpinum var. foliis-aureis, Hort.

A dwarf form of Alpine Currant with yellowish leaves. Hardy.

American Black Currant

Ribes americanum.

Ribes americanum, Mill. Ribes floridum, L'Herit. Ribes pennsylvanicum, Lam. Ribes missouriense, Hort.

An upright shrub to 5 feet, flowers greenish white or yellowish; fruit black, smooth. Native from Nova Scotia west to Manitoba, south to Colorado and Virginia.

"Wild Black Currant (**Ribes floridum,** L'Her.) A smooth shrub with glandular-dotted leaves and large yellowish-white flowers in drooping racemes; berry smooth, usually black (but paler forms occur) rather insipid tasting. Plentiful throughout the state; our commonest wild currant. It is easily transplanted and makes a good appearance among other shrubmery." Thomas A. Williams (28).

"**Ribes floridum,** L' Her. Wild Black Currant. Very common along streams from the Missouri valley eastward." D. A. Saunders (26).

"**Ribes floridum,** L' Herdit. (**R. Americanum,** Mill.) Wild Black Currant. Native to Canada and New England, south to Virginia, west to Dakota. In this state very common along streams east of the Missouri river. This plant is considered worthy of a good place in ornamental shrub collections in European gardens and should receive equal consideration at home. The long racemes of yellowish white blossoms are followed by black fruit much liked for jelly. In a plantation of 2,200 plants on the station grounds, raised from selected fruit in the hope of originating improved varieties, some plants have a handsome red brown foliage in the fall. This species is both useful and ornamental." N. E. Hansen (9).

Four varieties were introduced in 1925; the Tonah, Atta, Mato, and Wanka, described in South Dakota Bulletin 224 (11).

The Wild Black Currant in Manitoba

"This species seems to thrive only in the southern or agricultural part of the Province—damp woods being its natural home. * * * **Ribes floridum** responds to cultivation and twenty plants moved from a coulee over the fence into the garden have been known to yield thirty-five quarts of berries in their third year. It offers a good field for improvement by getting more productive and more larger-fruiting varieties." W. R. Leslie (17).

Slender Golden Currant

Ribes aureum.

Ribes aureum, Pursh. Ribes tenuiflorum, Lindl. Ribes aureum var. tenuiflorum Torr. Chrysobotrya aurea, Rydb. Ribes jasminiflorum, Agardh. Chrysobotrya intermedia and Chrysobotrya Lindleana, Spach.

Native from Washington to Saskatchewan, south to Montana, Colorado, California and New Mexico.

According to Alfred Rehder (2) "**Ribes aureum** is similar to **Ribes odoratum**; but smaller and more slender in every part; flowers yellow, fragrant or slightly fragrant; calyx-tube slender, one-fourth to one-third inch long or slightly longer; flowers 5 to 15 in a raceme.

"The fragrant plant cultivated at **Ribes aureum** is **Ribes odoratum.**" Standard Plant Names (1).

"Golden or Missouri Currant (**Ribes aureum,** Pursh.) A beautiful shrub with golden-yellow, spicy-fragrant flowers and smooth leaves. The fruit is usually black, but yellow colored forms are not uncommon. This is a valuable ornamental shrub, and some of the forms producing larger berries have been recommended for cultivation for the fruit. Found more or less plentiful along the Missouri and its tributaries." Thomas A. Williams (28).

"**Ribes aureum,** Pursh. Golden or Buffalo Currant. In thickets and along streams from the Missouri valley westward." D. A. Saunders (26).

Ribes aureum, Pursh., var. **chrysococcum,** Rydb.

Ribes leiobotrys, Koehne. A yellow-fruited form of **Ribes aureum** which has been found in many parts of the state, mixed with the typical black-fruited **Ribes aureum.** Some of these bear fruit of good size, especially as collected near Pierre, along the Cheyenne river and in the Black Hills.

Wax Currant

Ribes cereum.
Ribes cereum, Douglas.

A much-branched upright shrub to 4 feet; native from British Columbia and California east to South Dakota, south to Utah and Arizona. "Early leafing and conspicuous with its pale grayish green foliage studded with numerous white or pinkish flowers; also the bright red fruits are ornamental." Alfred Rehder (2).

"Squaw Currant (**Ribes cereum, Dougl.**). A small, scraggy shrub without prickles; leaves, flowers and young fruits usually dotted with resinous glands; berry red, not very palatable. Found pretty generally distributed west of the Missouri river." Thomas A. Williams (28).

Ribes cereum, Dougl. Squaw Currant. Common in the "draws" and canyons in the Black Hills and the adjacent plains. Doubtless extending eastward nearly to the Missouri river." D. A. Saunders (26).

Pasture Gooseberry

Ribes cynosbati.
Ribes cynosbati, Linnaeus. Grossularia cynosbati, Mill.

A shrub to 5 feet; native from New Brunswick to Manitoba, south to Alabama and North Carolina. Spines slender, bristles few or none; fruit roundish, vinous-red, prickly, edible.

Ribes diacantha, Pallas

Ribes saxatile, Pallas. "**Ribes Diacantha,** Pallas. (**R. saxtile,** Pallas.). Native of Siberia, from Altai to the Amur region; Sungaria, Manchuria. (S. P. I., No. 321, of United States Department of Agriculture.) A hardy, somewhat thorny shrub, 4 feet in height, not yet fruited." N. E. Hansen (9).

These plants grew 5 feet high and 8 feet across, densely branched, wide-spreading bushes, much like the Alpine Currant but of sturdier habit.

"Like the preceding species (Ribes alpinum, Linn.) desirable for its bright green more lustrous foliage and for its scarlet fruit, but habit upright, not spreading." L. H. Bailey (2).

"Flowers unisexual, the sexes on different plants. Males yellowish, in erect glandular racemes. Fruit roundish oval, about as big as a red currant, smooth, scarlet-red. Native of Siberia, Manchuria, etc., introduced in 1781. This shrub, which has no particular merit, resembles **Ribes alpinum** in the plants being one-sexed, but differs in having prickles, and in the markedly wedge-shaped leaves. In having spines, and flowers in racemes, it unites the characters of the currants and gooseberries, but its affinities are with the former." W. J. Bean (5).

Gordon Curant

Ribes gordonianum.

Ribes gordonianum, Lem. Ribes Beatonii, Hort. Ribes Loudonii, Hort. Ribes odoratum x Ribes sanguineum.

A hybrid, **Ribes odoratum** x Ribes **sanguineum,** raised near Ipswich, England, about 1837, by Donald Beaton. Ribes sanguineum is a red-flowered species native from British Columbia to northwest California. The Gordon Currant is intermediate between the parents, the flowers are reddish outside, yellowish within, somewhat glandular, sterile. At this station the plants attained a height of 7 feet and are hardy.

Ribes lacustre, Poir.—This is the Swamp Black Currant or Swamp Gooseberry, a shrub with slender weak stems, usually densely bristly; thorns slender, often clustered. Native from Newfoundland to Alaska, south to Massachusetts, South Dakota, Colorado and California.

"Swamp or Lowland Gooseberry (Ribes lacustre, Poir.) . Stem armed with prickles and weak thorns; berry small, bristly, with as unpleasant taste. In damp shady places. Rare. Black Hills, (Lead city and Sylvan lake.)" Thomas A. Williams (28).

"In the Black Hills." D. A. Saunders (26).

Ribes oxycanthoides, Linnaeus

Grossularia oxycanthoides, Mill.

Grossularia oxycanthoides, Cov. & Brit.

A low, usually thorny, shrub with smooth red fruit; native from Newfoundland to British Columbia, south to South Dakota and Michigan.

"The plant cultivated as Ribes **oxycanthoides** is usually **Ribes hirtellum** or **Ribes inerme.**" L. H. Bailey (2).

"Smooth Gooseberry (Ribes oxycanthoides L.). Much like the Missouri gooseberry but with whitish spines, greenish or purplish short-stalked flowers and short filaments. Fruits small, smooth, purple, pleasant. Brookings county, and probably throughout the state." Thomas A. Williams (28).

"In the Minnesota and Sioux valleys and in the Black Hills." D. A. Saunders (26).

European Black Currant

Ribes nigrum.
Ribes nigrum Linnaeus.

An upright shrub to 6 feet, with stout branches of strong disagreeable odor, fruit black, roundish. Native of Europe, north and central Asia, and the Himalayas. Much grown for the fruit in western Europe. In Minneapolis the writer has seen Black Currant jam imported from England. The Scandinavian name is Solbaer, meaning "Sunberry."

"Siberian Black Currant. Introduced 1910. Collected in the Tomsk province of Siberia in 1897. Fruit of good size and plant perfectly hardy when several varieties of Black Currant from England and Germany winter-killed. The ordinary black currant is a native of western Europe where the fruit is highly prized for jelly and jams. But it does not do well in the prairie Northwest. This Siberian black currant may be hardy far north into Northern Manitoba and Saskatchewan, Canada. However, since the coming of the White Pine blister rust, which the European Black Currant harbors, this species is outlawed wherever White Pine and other five-leaved pines are grown." N. E. Hansen (11).

Since then the work of improving the Siberian Black Currant at this station has resulted in several varieties with large fruit comparing favorably with the best European varieties.

Golden Currant

Ribes odoratum.
Ribes odoratum, Wendl. Ribes longiflorum, Nutt. Ribes fragrans, Lodd. Ribes palmatum, Thory. Ribes aureum, Auth. not Pursh. Ribes missouriense, Hort. Chrysobotrya revoluta, Spach. Chrysobotrya odorata, Rydb.

A handsome ornamental shrub, to 6 feet in height; native east of the Rocky Mountains, South Dakota to Texas, east to Minnesota and Arkansas. **Ribes odoratum** and **Ribes aureum** have been confused for a long time. According to Standardized Plant Names (1) **Ribes odoratum** species has more showy and fragrant flowers than Ribes aureum, under which name it is usually grown in nurseries.

According to Rehder in Bailey's Cyclopedia, there are 5 to 8 fragrant yellow flowers in a raceme with stout tube about one-half inch long; the petals are nearly half as long as the sepals, more or less red.

"A handsome shrub with yellow fragrant flowers appearing early in spring with the leaves. A form with large berries nearly three-fourths inch in diameter is sometimes cultivated for its fruits as the Crandall." L. H. Bailey (2).

Ribes setosum, Lindley

Ribes saximontanum, E. Nelson.
Ribes saximontanum, E. Nelson. Grossularia setosa, Cov. & Brit.

A low shrub to 3 feet, with reddish brown usually bristly branches; spines three-fourths inch or less long; fruit red to black, smooth or somewhat bristly. Native from South Dakota to Wyoming, Saskatchewan and Idaho.

"Spiny Gooseberry (**Ribes setosum**, Lindl.). Similar to the preceding (**R. oxycanthoides**) but Mr. Rydberg speaks of it as follows, 'It has been named **Ribes oxycanthoides** from which it differs in that the leaves are finely pubescent, the calyx-tube cylindrical and longer than the lobes, the

fruit being sometimes a little bristly and dark purple, extremely sour even when ripe.' Common in the Black Hills. (Custer, Minnekahta, Rapid City.)" Thomas A. Williams (28).

"Common in the 'draws' and canyons in the Black Hills and the adjacent plains. Doubtless extending eastward nearly to the Missouri river." D. A. Saunders (26).

Rose-Acacia

Robinia hispida.
Robinia hispida, Linnaeus.

Sometimes grafted high to form a small standard tree and, as such, to display its large flowers to advantage. The Rose-Acacia spreads much by suckers, especially in sandy soil. The stems, twigs, flower stalks, and often the leaf stalks are thickly covered with rough hairs or bristles.

Rehder, in his Manual of Cultivated Trees and Shrubs, gives the distribution as Virginia to Kentucky, to Georgia and Alabama.

"**Robinia hispida,** Linn. **Rose-Acacia.** Native in the mountains of southern United States from Virginia and North Carolina to Georgia. Not in the station collection; reported hardy at Mitchell and Yankton." N. E. Hansen (9).

Rose-Acacia. (Moss Locust.) An elegant shrub, with light green pinnate leaves and long graceful clusters of pea-shaped, rose-colored flowers in June, often throughout the summer. Very hardy." D. B. Gurney, Yankton, 1929.

"Pea-shaped rose colored flowers from June on. Quite hardy. Medium." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Roses

The experiments at this station with roses are detailed in South Dakota Bulletin 240, Hardy Roses for South Dakota, N. E. Hansen, June 1929. In the present bulletin, four of the native roses are listed as noted by Williams and Saunders.

Prickly Rose

Rosa acicularis.
Rose acicularis, Lindley.

"Say's Rose (**Rose acicularis,** Lindl.). A low rose with a very prickly stem, globose fruit and large, usually solitary flowers. It has been found at Big Stone, and probably occurs more or less plentifully on high grounds throughout the northern part of the state." Thomas A. Williams (28).

"Abundant in the Black Hills." D. A. Saunders (26).

Englemann Rose

Rosa acicularis Engelmanni.
Rosa acicularis, Lindl. var. Engelmanii, Crep.

Native of North Dakota and Montana to Colorado. Flowers, deep rose. Flowering branchets usually bristly.

"Engelmann's Rose (**Rosa engelmanni,** Watson). Stems often 3 or 4 feet high and more or less prickly; fruit ovate-oblong, half an inch or more

long. Not uncommon in the western part of the state, particularly in the Black Hills." Thomas A. Williams (28).

Arkansas Rose

Rosa arkansana.
Rosa arkansana, Porter.

Native from Wisconsin and Minnesota to Kansas and Colorado.

"Prairie Rose (Rosa arkansana, Porter). This is the common rose of our dry prairies. It is usually very prickly. It is one of the worst weeds in groves and forest plats and is often troublesome in grain fields, particularly where fall plowing is not practiced. Found throughout the state, though perhaps more abundant in the eastern half." Thomas A. Williams (28).

Meadow Rose

Rosa blanda.
Rosa blanda, Aiton. Rosa Solandri, Tratt. Rosa virginiana Koehne, not Mill. Rosa fraxinifolia, Borkh.

"Native from Newfoundland to Pennsylvania, Missouri, North Dakota, and Manitoba." Alfred Rehder (22).

"Smooth or Swamp Rose (Rosa blanda, Ait.). Stems rather tall, smooth or with few prickles. This is the common rose of the low grounds and rocky margins of lakes in the eastern part of the state." Thomas A. Williams (28).

"In thickets in the Minnesota and Sioux valleys." D. A. Saunders (26).

From the Rosa blanda of South Dakota, several double roses of value for cultivation have been developed at this station by the writer. These are Tetonkaha, Kitana, Okaga, Sioux Beauty, Tegala, Teton Beauty, Yanka, Yuhla, Zani, Zika, all described in South Dakota Bulletin 224, May, 1927, and South Dakota Bulletin 240, June 1929.

Woods Rose

Rosa woodsi.
Rosa woodsi, Lindl. Rosa Maximiliani, Ness. Rosa Sandbergii, Greene.

"Low Rose (Rosa woodsi, Lindl.). Stem usually low and smooth or with slender prickles. Common in the western part of the state where it replaces the preceding (R. blanda)." Thomas A. Williams (28).

"From the James valley westward, common only in the Black Hills." D. A. Saunders (26).

Rose Woodsi in Manitoba. "Low bush 1 to 3 feet high, armed with slender spines which are often wanting above. Stipules are broad and entire; leaflets five to seven; obovate somewhat serrate, flowers corymbed or solitary and upon the globose ovoid fruit, one-third to one-half inch in diameter, are erect sepals.

"Wood's rose is common to most of the Canadian prairies." Native Fruits of Manitoba, W. R. Leslie (17).

Woods Rose

Rosa woodsi fendleri.
Rosa woodsi, Lindl., var. Fendleri, Rydb.

Native from British Columbia and Minnesota to Arizona and Chihuahua.

"Fendler's Rose (**Rosa fendleri,** Crepin). Stems usually tall, moderate-prickly. Doubtfully distinct from **R. woodsii.** Common along edges of thickets and low places in the western part of the state." Thomas A. Williams (28).

Rubus nobilis

Rubus nobilis, Regel.—"Flowers purplish red, produced in terminal corymbs, in June and July. A handsome, vigorous shrub of about the same value for ornament as **R. odoratus**—the mother plant. The leaves resemble **R. Idaeus** in being trifoliolate, but the flowers owe their color and size largely to **R. odoratus.**" W. J. Bean (5).

"**Rubus nobilis,** Regel. A hybrid raspberry (**Rubus odoratus** X **Idaenus**). Of the two imported plants planted in the spring of 1899, one winter-killed and the other killed to the ground, but is sprouting up from the roots." N. E. Hansen (9).

Common Blackcap

Rubus occidentalis.

Rubus occidentalis, Linnaeus.

The Blackcap raspberry is native from New Brunswick to North Dakota, south to Georgia and Colorado. The cultivated varieties have been developed from the eastern type of the species and hence the fruit lists of the prairie Northwest are short of this choice fruit. The Tye Black cap raspberry was found growing wild near Mandan, North Dakota.

"Black Raspberry (**Rubus occidentalis,** L.). Stems armed with stout prickles and covered with a whitish bloom; leaves, white, downy beneath; fruit, black. Very abundant in thickets and open woods throughout the eastern half of the state and probably occuring to the westward also." Thomas A. Williams (28).

"**Rubus occidentalis,** L. From the Missouri river eastward. In general it is not common as the last, **(R. strigosus)** especially rare in the Missouri valley." D. A. Saunders (26).

Rubus occidentalis noted at Big Stone lake, Roberts county, South Dakota, by L. H. Pammel, 1917.

Whiteflowering Raspberry

Salmonberry
Rocky Mountain Thimbleberry

Rubus parviflorus.

Rubus parviflorus, Nutt. **Rubus nutkanus,** Moc. **Rubacer parviflorum,** Ryd. **Rubus lacer, Kuntze. Bossekia parviflora,** Greene.

Allied to **Rubus odoratus,** but with white flowers. Native of west Ontario and Michigan to the Pacific coast, southward in the Rockies to North Mexico. This is the Salmonberry of the Pacific coast. A vigorous, upright shrub with smooth stems and red berries. The name **"parviflorus"** meaning "small flower" is inappropriate, since the flowers are larger than those of **Rubus odoratus,** its nearest ally. Winter-killed at Brookings.

The native South Dakota form of this species has been noted in the Black Hills by Williams and Saunders.

"Salmon-Berry (**Rubus parviflorus, Nutt.**). Distinguished from our

other species by the larger flowers and the simple, five-lobed leaves. Found in the Black Hills." Thomas A. Williams (28).

"In the Black Hills." D. A. Saunders (26).

Rubus parvifolius, Linnaeus

Rubus triphyllus, Thunb. Native of China and Japan. A low shrub with arching hairy prickly stems. Winter-killed at Brookings.

Common Red Raspberry

Rubus strigosus.

Rubus strigosus, Michx. Rubus Idaeus, Linn., var. strigosus, Maxim.

Rehder, in his Manual of Cultivated Trees and Shrubs, describes this as a circumpolar species, **Rubus Idaeus**, Linn., var. **strigosus**, Maxim., being found from Newfoundland to British Columbia, south to Virginia and Wyoming; also in east Asia.

"Red Raspberry (**Rubus strigosus**, Michx.) Stem with few prickles but often densely covered with stiff, straight bristles; fruit red. More or less common throughout the entire state, growing in thickets and on rather dry, wooded hills." Thomas A. Williams (28).

"Along streams and in the rocky places throughout the state." D. A. Saunders (26).

The writer has grown many thousands of seedlings of **Rubus strigosus** as found in the prairie Northwest. Eight varieties have been distributed —Fewthorn, Moonbeam, Ohta, Smooth Cane, Spineless, Starlight, Sunbeam, and Twilight—all described in South Dakota Bulletin 224.

American Elder

Sambucus canadensis.

Sambucus canadensis, Linnaeus.

"Elder (**Sambucus canadensis**, L.). A shrub with large pith, broad flat clusters of fragrant, white flowers and small, purplish black berries. The buds, leaves, inner bark, flowers and fruits are used in medicine. It occurs in the Black Hills and in the southeast corner of the state." Thomas A. Williams (28).

"In moist soil near Rapid City in the Black Hills." D. A. Saunders (26).

"A shrub with white flowers and purplish-black berries, growing on flood plains in the southeastern part of the state." W. H. Over (19).

"**Sambucus canadensis**, Linn. Elderberry. Native from New Brunswick south to Florida, west to Utah. The Speer elderberry is a large-fruited variety, found by R. P. Speer, near Cedar Falls, Iowa. It is a large spreading bush with handsome foliage. It kills back severely every winter; flowers freely on the new growth, but sets little or no fruit. The native form, occurring in the Black Hills and the southeastern corner of the state, merits attention." N. E. Hansen (9).

As collected by the writer in northwestern Minnesota, this native Elder is hardy at Brookings.

Cutleaf American Elder

Sambucus canadensis acutiloba.

Sambucus canadensis var. acutiloba, Ellwanger & Barry. Sambucus canadensis laciniata, Cowell, Not Gray.

A cut-leaved variety, more graceful than the cut-leaved form of the Common Elder because of the longer and more divided leaf. The dark

green fern-like leaves are finely cut. This shrub killed back considerably but is worthy of a sheltered place.

Golden American Elder

Sambucus canadensis aurea.

Sambucus canadensis var. aurea, Cowell. Sambucus canadensis var. delicatissima, Schwerin.

Leaves golden yellow; fruit cherry red. This Golden American Elder planted in the background of the shrub border with some purple-red leaved shrub, like Cistena Sand Cherry in front, makes an interesting contrast of color.

Sambucus coerulea, Raf.

Sambucus californica, K. Koch. Sambucus velutina, Durand.

A handsome shrub with bluish white fruit and leaves, young shoots and flower stems thickly covered with whitish velvety down. Not sufficiently hardy at this station.

A variety of **Sambucus coerulea,** "the Blueberry Elder" native of California.

European Elder

Sambucus nigra.

Sambucus nigra, Linnaeus.

Large shrub or small tree to 30 feet or more. Native of Europe, north Africa and west Asia. One of the best known shrubs. Leaves pinnate; flowers white, in flat umbels, berries roundish, shiny black; from the fruit when boiled in sugar, a syrup is made which has long been used for colds. Only a few of the many varieties have been tested.

Sambucus nigra heterophylla, Endl.—Leaflets irregularly cut, sometimes nearly to the midrib. Killed nearly to the ground but made a good recovery.

"Sambucus nigra var. heterophylla (linearis). In this form the blade of many leaflets is reduced to thread-like proportions, consisting of little more than the stalk and midrib. Others are one-eighth to three-quarters inch wide, but distorted and shapeless. A curiosity only." W. J. Bean (5).

Sambucus nigra rotundifolia, Endl.—With leaflets broad-ovate to nearly round, usually three. Killed to the ground but made a good recovery.

Sambucus nigra semperflorens, Hort. **"Semperflorens"** means everbearing. A variety long in bloom. Killed to the ground.

Sambucus nigra var. laciniata.—Parsley-leaved Elder. The handsomest cut-leaved variety of common elder, the leaflets being pinnately divided into linear, pointed lobes." W. J. Bean (5).

Sambucus nigra var. viridis, West

Sambucus nigra var. chlorocarpa, Hayne. Sambucus nigra var. fructualbo. Sambucus nigra chlorocarpa, Hort. Sambucus virescens DC. A variety of European Elder with greenish white fruit. Killed nearly to the ground but recovered later.

Scarlet Elder

Sambucus pubens.

Sambucus pubens, Michaux. Sambucus racemosa Gray, not Linn. Sambucus racemosa var. pubens S. Wats. Sambucus racemosa var. pubescens, Dippel.

A handsome shrub with attractive scarlet berries; native from New Brunswick to South Dakota, south to Georgia and Colorado.

"Red-berried Elder (Sambucus pubens Michx.) This may be distanguished from common elder by the paniculately clustered flowers and red berries. Not uncommon in the Black Hills." Thomas A. Williams (28).

"This species, which is found wild over a considerable area in North America on both the eastern and western sides, is so closely allied to the Old World Sambucus racemosa, that many authors do not separate them. The American shrub is distinguished by its young shoots, leaves, and flower-stalks, being downy, the pith being brown, and the fruit-panicles not so densely packed with berries." W. J. Bean (5).

"Sambucus pubens is a native shrub of value, especially for the wilder parts of the shrubbery. It grows to be from 5 to 7 feet in height, and is the first shrub to leaf out and bloom in the spring. The fruit ripens very early and is much liked by the birds. The birds scatter the seeds widely so that volunteer bushes are plentiful.

The black-berried elder, Sambucus canadensis, blooms in mid-summer while the red-berried elder is fruiting.

A golden leaved variety is planted, but one must be cautious not to get too many of them." L. R. Moyer (18).

Greasewood

Sarcobatus vermiculatus, Torrey.
Sarcobatus vermiculatus, Hook.

A much-branched rigid, hairy shrub, to 10 feet high; native from Alberta and North Dakota to California and New Mexico.

"Greasewood (Sarcobatus vermiculatus, Hook). An erect, scraggy shrub; branches white; leaves pale, linear. Common on dry, sterile soil along the Cheyenne river and in the Bad Lands." Thomas A. Williams (28).

"Greasewood. Sarcobatus vermiculatus, Torr. Two to 8 feet; southern Wyoming and southward (also in the Great Basin to the upper Missouri); spreading, scraggy; branches stiff, with white bark; leaves narrow. Most abundant of the shrubs called "Greasewood." George B. Sudworth, Forest Conditions of the Rocky Mountains (27).

Silver Buffaloberry

Shepherdia argentea.
Shepherdia argentea, Nuttall. Lepargyraea argentea, Greene.

"Buffalo Berry (Shepherdia argentea, Nutt.). A large thorny shrub or small tree with silvery leaves and younger branches, and clusters of red or amber-yellow berries. Valuable as a hedge or ornamental plant, while the fruit is much used in making jellies, etc., common over the western half of the state." Thomas A. Williams (28).

"Lepargyraea argentea, (Nutt.) Greene. Buffalo Berry. Shepherdia argentea, Nutt. Common on bluffs and in thickets from the Missouri valley westward; occasional on bluffs in coulees in the Minnesota valley." D. A. Saunders (26).

"Stream banks and flood plains more or less over the state. Locally abundant from the Missouri river and westward. Fruit appears in clusters and of a bright red. Frequently used for making jelly as well as eat-

en by many species of birds. Leaves silvery on both sides." W. H. Over (19).

"Shepherdia argentea, Nutt. Buffalo Berry. A shrub 6 to 18 feet in height, native from Manitoba and Minnesota to Saskatchewan and Nevada. In South Dakota it is common in the Missouri valley, rare in the Minnesota valley. The revised name, Lepargyraea argentea, (Nutt.) Green awaits acceptance by nurserymen. The Buffalo Berry is a handsome ornamental bush with silvery foliage and red berries. Occasional plants are found with yellow fruit. The plant is dioecious, hence care should be taken, if fruit is desired, to plant both male and female plants. Some groups of Buffalo Berry planted while small some years ago at Brookings, turned out to be all staminate or male plants, hence no fruit is produced. Two of the groups contain some pistillate as well as staminate plants and an abundance of fruit is secured every year. The staminate or male plants may be known in their winter condition by the dense clusters of rounded flower buds; the pistillate or female plants by the smaller, flattened, fewer, more slender flower buds. The fruit varies greatly in size, quality and season and is gathered in large quantities for culinary use. It makes a delicious jelly. Some berries are of sprightly flavor, good for eating out of hand. It can also be dried for winter use. The fruit is generally considered better when touched by frost, less sugar being required. The name is said to have come from the custom of eating the berries as a sauce with buffalo meat in the early days. The Buffalo Berry makes a fine thorny hedge, which is both useful and ornamental. We find that sprouts received as dug up in the native thickets from various parts of the northwest do not always transplant satisfactorily; a year in nursery row gives them better roots and secures an even stand when set in their permanent place. Seedlings are better rooted. The writer is raising thousands of seedlings with a view to improving the fruit in size and quality. Seedlings are very easily raised from seed washed free from the pulp in the fall and stratified for winter freezing in sand, in the same manner as described for Elaeagnus angustifolia, and planted very early in the spring." N. E. Hansen (9).

These experiments were continued until over 7500 plants were in the plantation. These were mainly from seed of a large yellow-fruited type from the Crow Creek Indian Reservation, South Dakota. The only available land was too low and wet for the best results and it became necessary to discontinue the work. However, enough variation was apparent to show that the improvement of the native Buffaloberry is a very promising field. It is a good fruit for dry lands.

It is of interest to note **Shepherdia gottingensis** Rehder is a hybrid **Shepherdia argentea x canadensis.** "**Shepherdia gottingensis** Rehder. The scales which are divided to the base in **Shepherdia canadensis** and merely dentate in **Shepherdia argentea** are divided about one-half to the middle in the hybrid. Originated about 1892." Alfred Rehder (22).

Russet Buffaloberry

Shepherdia canadensis.

Shepherdia canadensis, Nuttall. Lepargyraea canadensis, Greene.

A spreading unarmed shrub, 6 to 8 feet high, native from Newfoundland to Alaska, south to Wisconsin and New Mexico.

"Low Shepherdia (**Shepherdia canadensis**, Nutt.) . A small shrub with the leaves green above and silvery-downy and scurfy beneath; fruit yel-

lowish red, insipid. More or less common in the Black Hills." Thomas A. Williams (28).

"**Lepargyraea canadensis**, (L.) Greene. Canadian Buffalo Berry. **Shepherdia canadensis**, Nutt. Occasional from the Missouri river to the Black Hills." D. A. Saunders (26).

"Squawberry (**Shepherdia canadensis**). A smaller shrub than the preceding (**S. argentea**) and leaves silvery only on one side. Fruit red or yellow and more bitter to the taste than the buffalo berry. Range about the same." W. H. Over (19).

"The shrub is interesting, and in the singular aspect of the under-surface of the leaf under the lens is worth notice, the thick basis of silvery hair-tufts being interspersed with brown scales, each scale with a dark, glistening, eye-like center." W. J. Bean (5).

Ural False-Spirea

Sorbaria sorbifolia.

Sorbaria sorbifolia, A. Braun. Spiraea sorbifolia, Linnaeus. Spiraea pinnata, Moench. Basilima sorbifolia, Rafin.

"The name of this genus under the American Rules, in Schizonotus." Standardized Plant Names (1).

There are eight species of Sorbaria in eastern Asia. Formerly united with Spiraea, but easily distinguished by the pinnate (feathery) leaves. "The sorbarias are very handsome upright shrubs with rather large bright green pinnate leaves and small white flowers in large and showy panicles appearing in summer and followed by small capsular fruits; the panicles, however, after the flowers have faded and dried up, become rather unsightly and should be removed. * * * The handsome bright green foliage appears very early in spring." Alfred Rehder (2).

An upright shrub 6 feet high, native of north Asia from the Ural mountains to Japan. The leaves are 8 to 12 inches long, with 13 to 25 leaflets. sharply double-toothed, green and usually quite smooth above and beneath. Flowers white in a stiff erect raceme to 10 inches long; well adapted for rough shrubbery and for planting on river-banks, but the numerous root-sprouts are too aggressive and are apt to crowd out small shrubs. Hardy at this station.

"Sorbaria that nurserymen call Mountain ash-leaved spiraea is very useful for filling in a wild corner." L. R. Moyer (18).

Spirea

Spiraea.—As a class, the Spiraeas are very ornamental and popular shrubs. All are medium-sized or low shrubs and well adapted for shrub borders, as single specimens on the lawn or for rockeries. Spirea is the ancient Greek name for a plant used for gardens.

"More than 80 species in the temperate regions of the northern Hemisphere, in America, south to Mexico, in Asia to the Himalayas. Most of the species have been introduced into cultivation, many of them, including numerous hybrids originated in cultivation, are popular garden shrubs and much planted on account of their decorative flowers." Alfred Rehder (22).

The Spireas produce fertile seed in abundance but cross-breed so readily that they do not come true to seed except when fairly isolated from

other species. Some of the very best and most popular Spireas are hybrids, but these are now so numerous that they make the genus extremely difficult to classify.

The genus has been divided into several genera in recent years by various authors. There is a monograph of Spiraea and allied genera by Maximowicz, of Russia, 1879, and a monograph of the cultivated species of Spiraea and their numerous hybrids, by Zabel of Germany, 1893.

Spirea

Careful pruning of the spirea brings ample returns in more abundant flowers. Unless properly pruned many spireas get into crowded condition and the blossoms will be inferior in quality and quantity to those borne by plants that are properly pruned. Spireas may be divided into two groups:

1. Those that flower early and form buds on shoots of the previous years growth, such as arguta, hypricifolia, Vanhouttei, etc. In all of this group the older and weaker wood should be thinned out but the tips of the shoots must not be pruned, as that means fewer flowers next year.

2. Those that flower later in the season on the tips of the current seasons growth, such as japonica, salicifolia, Douglasii, etc. This group should have the shoots shortened at the tips so that there will be much flowering wood the next season. This pruning should be done in late winter or early spring. Of course the old shoots that are too crowded should be removed entirely.

Spireas that Sucker from the Roots

Some spireas, such as douglasii, salicifolia, tomentosa, and their hybrids spread rapidly by a multitude of underground suckers or root sprouts. If these are left undisturbed they will form a dense thicket and the flowers will be inferior because they are overcrowded. They should be pruned as in group two, by thinning out the older or weaker wood, but the shoots not pruned back at the tips. Where it is possible to reduce the number of superfluous sprouts with a sharp hoe or spade the whole mass should be dug every few years, divided into smaller clumps, and after enriching the soil with well-rotted manure or some good commercial fertilizer, replant them farther apart so that they may have opportunity for making new growth. However, where there is abundant room there is but little need of that, and they can be left to take care of themselves for a long time.

Meadow Spirea

Spiraea alba.

Spiraea salicifolia var. paniculata, Ait. Spiraea lanceolata, Borkh.

An upright shrub to 6 feet, flowers white in leafy pyramidal slightly downy panicles. Native from New York to Missouri, south to Georgia and Mississippi. Allied to **Spiraea salicifolia**, native of Europe to Japan.

Some authors classify this as a variety: **Spiraea salicifolia var. paniculata.**

"**Spiraea salicifolia**, Linnaeus, var **paniculata**, Aiton (**S. alba** Duroi). This is the finest form of **Spiraea salicifolia**. Leaves narrowly oval or ovate; inflorescence 8 to 12 inches long, as much wide, much branched, slightly downy. Flowers white or rosy-tinted. This Spiraea is sometimes regarded as a distinct species (S. alba), and the preceding one (latifolia)

as its variety. They differ from salicifolia in the much larger, compound panicles of pyramidal rather than cylindrical shape. Native of North America, with a more western distribution than var. **latifolia.**" W. J. Bean (5).

"**Spiraea alba,** Duroi. An American species, a large spreading bush 3 feet in height; kills back one-third, but flowers freely on the ends of young shoots. The pinkish white flowers appear in profusion in early July." N. E. Hansen (9).

"**Spirea, Alba** or **Salicifolia.** This is a hardy native and the only native spirea in North Dakota. Resembles very closely the Billardi, except that the blossoms are always white." George F. Will, Bismarck, North Dakota, 1929.

"Willow-leaved Meadow-sweet (**Spiraea salicifolia,** L.) . A low shrub with narrow, toothed leaves and crowded panicles of white or flesh-colored flowers. Very pretty and easily cultivated. Not uncommon in the Sioux valley and Big Stone regions." Thomas A. Williams (28).

"**Spiraea salicifolia,** L. Willow-leaved Meadowsweet. In moist ground in the Minnesota valley, and in the Sioux valley near Sioux Falls." D. A. Saunders (26).

According to Rehder in Bailey's Cyclopedia of Horticulture, **Spiraea alba** is found chiefly west of the Alleghanies. (See under **Spiraea salicifolia.**)

Japanese Spirea

Spiraea albiflora.

Spiraea albiflora, Zabel. Spiraea albiflora, Miquel. Spiraea callosa alba, Hort. Spiraea japonica, Linn., fil., vr. alba, Nichols.

"A shrub of dwarfer, weaker growth than the type; young shoots downy and distinctly ribbed; leaves shorter-stalked and smaller; flowers white. Some authors regard this as a distinct species." W. J. Bean (5).

"Handsome compact shrub with profusely produced white flowers." Alfred Rehder (22).

"**Spiraea albiflora,** Zabel. Native of Japan. In 1899 this formed a small clump one foot in height, covered with pure white flowers in early July, but it is now dead." N. E. Hansen (9).

Garland Spirea

Spiraea arguta.

Spiraea arguta, Zabel.

According to Rehder **Spiraea arguta** is a hybrid **(Spiraea Thunbergii x Spiraea multiflora).**

"**Spiraea arguta,** Zabel. According to Dippel this is a hybrid of three species **(S. media x crenata x hypericifolia)** all of which range from eastern or southeastern Europe westward through Mongolia and Siberia. A very choice and hardy shrub, now four and one-half feet in height, forming a dense roundish upright mass of slender branches set with small light green leaves. One of the earliest shrubs to flower on the station grounds, usually beginning the first of May and continuing for four weeks. The blossoms are small, white and thickly set on the slender branches. A good substitute for the "Bridal Wreath" Spirea of the eastern states which is not hardy here." N. E. Hansen (9).

"Three species are believed to have a share in the parentage of this hybrid, viz., **Thunbergii, crenata,** and **hypericifolia.** It is the most beautiful

of the spring-flowering Spiraeas, being quite hardy and never failing to produce a wreath of blossom. The flower clusters are crowded on the upper side of shoots made the previous year, forming snowy white wreaths from 6 inches to 12 inches long. It is most conveniently increased by means of layers, its slender lissom branches adapting themselves admirably to this method." W. J. Bean (5).

Spiraea aubifolia.—"Spiraea aubifolia, Hort. This is regarded as a dwarfish form of S. alba latifolia by Dippel. It kills back every winter, but is a vigorous grower and a free bloomer through July. Blossoms flesh color changing to white. Dippel gives its nativity as North America and the islands of Sachalin." N. E. Hansen (9).

Himalayan Spirea

Spiraea bella.
Spiraea bella, Sims. Spiraea expansa, Wall. Spiraea ovata, Hort. Spiraea coccinea, Hort.

A shrub 3 to 6 feet high, with angular slightly hairy young branches, and bright rose flowers. Native of the Himalayas, also occurring in Sikkim and Nepal. Winter-killed at this station.

Spiraea Bethlehemensis rubra, Hort.—"Spiraea Bethlehemensis rubra, Hort. A bush 3 feet in height; kills back nearly to the ground, but blossoms freely through July on the tips of the many vigorous young shoots. The rose-pink blossoms are produced in large panicles and are attractive at a time when few shrubs are in bloom." N. E. Hansen (9).

According to Alfred Rehder, in Bailey's Cyclopedia of Horticulture (2) this is very similar to the Billiard spiraea "and probably of the same parentage."

"**Spiraea Lenneana, Spiraea bethlehemensis rubra, Spiraea triumphans, Spiraea eximia, Spiraea Constantiae, Spiraea californica,** Hort., are very similar and probably of the same parentage as the **Spiraea Billardii,** Herincq." Alfred Rehder (2).

Billiard Spirea

Spiraea billardii.
Spiraea billardii, Heriocq.

A hybrid **(Spiraea Douglasii x Salicifolia);**originated before 1854. A shrub six feet high, now much planted.

According to Rehder (in Manual of Cultivated Plants and Bailey's Cyclopedia of Horticulture) **S. Lenneana, S. Bethlehemensis rubra, S. triumphans, S. eximia, S. Constantiae,** and **S. Californica,** Hort.,are very similar and probably of the same parentage as S. Billardii.

"**Spiraea billardii,** Hort. Billiard's Spirea. A bush 4½ feet in height, of neat upright habit. Kills back one-third, but flowers freely every year in late June and through July. The attractive dark pink blossoms appear in large many-branched panicles on the tips of the young shoots. Desirable." N. E. Hansen (9).

Spiraea billardii longipaniculata, Hort.—"A hybrid variety in bloom the last of June and July. This shrub is sufficiently hardy, killing back a little at the tips. The long much-branched panicles of bright rose colored blossoms are attractive." N. E. Hansen (9).

Bumalda Spirea

Spiraea Bumalda, Burvenich.
Spiraea japonica x S. albiflora. Spiraea pumila, Zabel.

"**Spiraea japonica** var. **bumalda** (**S. bumalda,** Hort.). A dwarf neat, yet elegant variety usually under 18 inches high. Flowers in flat corymbs, and of a beautiful carmine shade." W. J. Bean (5).

A low shrub 2 feet high, with striped smooth branches; flowers white to deep pink. Originated before 1890. A handsome and very variable hybrid. Two of the other best known forms are, var. **Froebeli,** Rehder; var. **Anthony Waterer.** Spiraea **Bumalda** winter-killed at this station.

Germander Spirea

Spiraea chamaedryfolia.
Spiraea chamaedryfolia, Linnaeus. Spiraea flexuosa, Fisch.

A shrub of erect habit, to 6 feet in height, with angular smooth yellowish branchlets. Native from east Europe, over the Ural mountains to Siberia and northeastern Asia. White flowers one-third inch across, in many-flowered umbels.

Hardy at this station, but unless pruned, many dead shoots will accumulate. This is in accordance with the following observation by W. J. Bean, in "Trees and Shrubs Hardy in the British Isles" (5). "**Spiraea chamaedrifolia** is a rather variable species with a very wide natural distribution. * * * In all its forms it is an attractive and reliable shrub, usually escaping late frosts and flowering during May; var. **ulmifolia** opening towards the end of the month. It renews itself by sending up every year strong erect sucker growths from the ground, which produce flowers on short twigs the following year; and, to give these their best chance, sufficient of the older shoots should be pruned out after flowering to enable them to develop freely and strongly."

Spiraea cinerea superhypericifolia, Zabel.—"**Spiraea cinerea superhypericifolia,** Zabel. A hybrid. Height 2½ feet, killing back every winter, but forming a very neat dense mass of foliage; blossoms white in late May." N. E. Hansen (9).
Not noted by Bailey or Rehder or in Standardized Plant Names (1).

Spiraea crenata, Linn., var. **inflexa,** K. Koch.
Spiraea conferta, Zabel

"**Spiraea conferta, Zabel.** A hybrid (**S. cana x crenata**). A bush 3 feet in height, forming a broad clump of graceful foliage and slender branches. Blossoms white in early June. Bush hardy and very attractive, but not a free bloomer." N. E. Hansen (9).

According to Rehder this is a hybrid (**S. crenata x cana**). Originated before 1850. The young branches and inflorescence are pubescent.

Spiraea densiflora, Nutt

Spiraea betulifolia var. rosea, Gray. Spiraea splendens, Baumann. Spiraea rosea, Koehne. Spiraea arbuscula, Koehne. Native from British Columbia, South Dakota, Wyoming and Oregon. A low shrub about 2 feet high; flowers bright rose-colored, in attractive dense clusters.

"Birch-leaved Meadow-Sweet. (**Spiraea betulifolia corymbosa** [Raf.] Wats.). A small shrub with reddish bark and whitish or pale purple flow-

ers in close corymbs. Not uncommon in the Black Hills." Thomas A. Williams (28).

Douglas Spirea

Spiraea douglasi.
Spiraea douglasii, Hook.

"**Spiraea douglasii,** Hook. Native of British Columbia, Oregon and northern California. Bush 4 feet in height, kills back a little but is a very free bloomer in July and August. The rose pink blossoms are in panicles on the ends of the young shoots. A choice shrub worthy of cultivation owing to its late blossoming." N. E. Hansen (9).

A handsome shrub to 8 feet high, spreading by suckers; with reddish brown branches. The late blooming of the large dense rather narrow panicles of rosy pink flowers make this a valuable shrub.

One lot of Douglas Spirea in exposed situation, winter-killed. It evidently needs a sheltered place and water in the fall for the best results. The young shoots should be pruned back in winter after flowering. As the sprouts make a dense mass if left undisturbed they should be thinned and transplanted every few years.

Spiraea eximia, Booth.—"Spiraea eximea, Booth. A hybrid **(S. douglasii x salicifolia).** A bush 4 feet in height, kills back nearly to the ground, but flowers freely in the numerous strong young shoots. Blossoms are rose colored in panicles and appear all summer, beginning about July first. Flowers are not large, but attractive." N. E. Hansen (9).

According to Standardized Plant Names (1) this is a synonym of the Billiard Spirea.

White Fontenay Spirea

Spiraea fontenaysi alba, Hort.
Spiraea fontenaysii, Lebas. Spiraea fontenaysii, Billiard, var. alba, Zabel.

An upright shrub 6 feet high, with slender upright branches and white flowers. A hybrid **(S. canescens x salicifolia).** S. canescens is native of the Himalayas, S. **salicifolia** is native of east Europe to Japan.

Pink Fontenay Spirea

Spiraea fontenaysii, Lebas, var. **rosea,** Lebas.
Spiraea fontenaysiensis Dippel. Spiraea fontenaysiensis rosea, Hort.

A hybrid **(S. canescens x salicifolia.)** A rose-colored form of the Fontenay Spirea **(S. fontenaysi).** Winter-killed at this station.

Fox Spirea

Spiraea foxi.
Spiraea foxii, Zabel. Spiraea foxii, K. Koch.

A hybrid **(S. corymbosa x S. japonica).** A garden hybrid similar to, but less desirable than **Spiraea Margaritae.** A low shrub with light, nearly smooth, red brown branches. Flowers white or pinkish. Winter-killed at this station.

Spiraea hypericifolia, Linnaeus.—"**Spiraea hypericifolia,** Linn. Native of southern Russia and southeast Europe, across the Ural mountains to eastern Siberia and Mongolia, also the Orient and Caucausus to Turkestan. A hardy shrub 4 feet in height. The very abundant, handsome white flowers appear during May and early June." N. E. Hansen (9).

Spiraea hypericifolia var. truncata, Zabel

Spiraea hypericifolia thalictroides, Hort., not Pallas.

"**Spiraea hypericifolia thalictroides,** Hort. Native of Siberia and Dahuria. A bush 2½ feet in height, forming a dense mass of slender shoots and small leaves. A fairly hardy dwarf bush of graceful habit. The white blossoms appear in late May and early June." N. E. Hansen (9).

Japanese Spirea

Spiraea japonica.

Spiraea japonica, Linnaeus. Spiraea callosa, Thunb.

A very variable species native of Japan and China.

"**Spiraea japonica** may be taken as the type of a large and valuable group of Spiraeas which flower in summer on the shoots of the year, and produce the blossoms in a large flattish inflorescence. They are all handsome, and should be pruned in spring by cutting clean out sufficient of the older wood to prevent crowding, and then shortening back those selected to remain." W. J. Bean, in "Trees and Shrubs Hardy in the British Isles" (5).

Other varieties are: **S. japonica var. alba (S. albiflora,** Miquel; **S. callosa alba,** Hort.); **S. japonica var. bumalda (S. bumalda,** Hort.); **S. japonica var. Anthony Waterer; S. japonica var. glabrata S. glabrata,** Lange); **S. japonica var. macrophylla,** Zabel; **S. japonica var. ruberrima.**

In western nursery catalogs at present, **Spirea Anthony Waterer, Spirea Bumalda,** and **Spirea callosa alba** are prominent.

Bigleaf Japanese Spirea

Spiraea japonica macrophylla.

Spiraea macrophylla. Spiraea japonica, Linn.

A large-leaved variety of Japanese Spirea. Leaves up to 6 inches long; flower corymbs small. Winter-killed at the station.

Korean Spiraea

Spiraea trichocarpa.

Spiraea trichocarpa, Nakai.

This new handsome shrub has the same graceful arching stems as Spiraea Van Houttei but the flowers are larger. Native of Korea, introduced 1920.

"This is a new perfectly hardy species from Korea and forms a broad spreading shrub from 4 to 6 feet tall. Its arching stems, in season, are laden with broad dome-like clusters of snow white flowers which are distinctly 'eyed' at the center so that it does not have quite the same dead effect as the well known Spiraea Van Houttei. It blooms much later and is considered a far superior variety." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Sibiraea laevigata, Maximowicz

Sibiraea altaiensis, Schneid.

A shrub to 5 feet high, with stout upright branches. The flowers are polygamous, in terminal panicles. Those of the staminate plant are somewhat showier.

"Native of Siberia; introduced to Britain in 1774. This species, whilst not particularly showy, is quite distinct from all other Spiraeas in its foliage, which in shape and colour is more suggestive of a spurge (Euphorbia) than the genus to which it belongs. Shrubs 4 feet high are often as much as 7 feet through." W. J. Bean (5).

"**Spiraea laevigata,** Linn. Dippel referrs this to **Sibiraea laevigata,** Maxim. A native of Siberia, especially of the Altai and Thian-schan mountains. Many specimens imported direct from Russia as well as from a nursery in Germany have proved very hardy. It is very early in leafing out in the spring, being in full foliage the first of May. The large terminal panicles of white flowers appear in late May and early June. The branches are erect, rigid, red-brown. Leaves three inches long, somewhat glossy, of a peculiar blue-green color. Worthy of propagation." N. E. Hansen (9).

The seed pods are not ornamental and should be removed so as not to detract from the beauty of the foliage.

Pink Meadow Spirea

Spiraea latifolia.

Spiraea latifolia, Borkl. Spiraea Bethlehemensis, Hort. partly. Spiraea carpinifolia, Willd. Spiraea salicifolia var. latifolia, Ait. Spiraea canadensis, Hort.

"**Spiraea Bethlehemensis,** Hort. Referred to **S. alba latifolia** by Dippel. Present height 3½ feet. Kills back, but flowers freely on ends of young shoots. The bush is of open, sprawling habit and needs pinching to keep it in shape. The dark pink flowers appear in large panicles through July and August." N. E. Hansen (9).

Queen of the Meadow. Meadow Sweet.—A shrub 2 to 5 feet high, native from Newfoundland and Canada to North Carolina. The flowers are white or slightly pinkish, larger than those of **Spiraea alba,** usually with the stamens and disk more or less pinkish.

According to Alfred Rehder (2) **Spiraea latifolia** is chiefly found east of and in the Alleghanies. (See under **Spiraea salicifolia.**)

Spiraea lenneana, Hort.—A shrub 6 feet high with brown pubescent branches.

"**Spiraea lenneana,** Hort. A hybrid **(S. Douglasii x latifolia).** A bush 3 feet in height, of strong spreading habit. Kills back one-third but produces numerous strong shoots tipped with large and uneven panicles of pink flowers during July and August. Desirable and sufficiently hardy." N. E. Hansen (9).

According to Rehder, this is very similar to the Billiard Spirea and probably of the same parentage.

Spiraea longigemmis, Maxim.—A graceful shrub 5 feet high, with smooth, slender, spreading angular stems. Foliage bright green.

"Native of north China in the province of Kansu; also found by Wilson in west China. It is a very pretty white-flowered Spirea blossoming late enough to escape injury by frost." W. J. Bean (5).

Winter-killed at Brookings.

Margarita Spirea

Spiraea margaritae, Zabel.

A hybrid **(S. japonica x superba** [**albiflora x corymbosa**]). A handsome shrub to 5 feet in height with red brown branches, at first finely pubescent,

later nearly or quite smooth; flowers bright rose-pink. A very beautiful shrub, flowering very freely when 1 foot high.

"**Spiraea Margaritae,** Zabel. A hybrid (**(S. Japonica x superba).** This forms a low shrub, eighteen inches in height, killing to the ground nearly every winter, but flowering freely in July and August on ends of the young shoots. The pretty pink flowers are useful for bouquets. A plant worthy of winter protection." N. E. Hansen (9).

As recommended for the Japanese Spirea, the older shoots should be removed entirely the winter following their flowering and the young shoots should be pruned back to one foot. If the flowers are removed as they fade, the period of bloom is prolonged until frost.

Spiraea micropetala, Zabel.—A hybrid **(Spiraea hypericifolia** x **Spiraea media),** originated before 1878. Flowers in sessile umbels which are partly on leafy stalks. This makes a very hardy, densely branched bush, 6 feet high and 6 feet across. The parent species, **Spiraea hypericifolia,** Linnaeus, is native of southeastern Europe to Siberia and central Asia, and **Spiraea media,** Schmidt, is native of southern Europe to northeastern Asia.

According to Dippel, **Spiraea micropetala** is a hybrid of **Spiraea hypericifolia,** Linn., var **acutifolia,** Maxim., a native of Siberia, with **Spiraea media** (?) Zabel.

Physocarpus monogynus, Coult.

Opulaster monogynus, Kuntze.
Spiraea monogyna, Torr. Neillia Torreyi, Wats.

A handsome shrub 3 feet high, native from Colorado to California, east to South Dakota. Formerly referred to Spiraea from which it is easily distinguished by the inflated seed follicles and the long glossy seeds.

"Western Ninebark **(Opulaster monogynus,** Tor.) A small shrub with finely pubescent leaves, having fruit and bark coming off in shreds. This would be valuable for cultivation. It is the Physocarpus Torreyi of Coulter's Manual. Plentiful along the steep sides of canyons in the Black Hills." Thomas A. Williams (28).

"**Opulaster monogyna,** (Torr.) Kuntze. Small-flowered Ninebark. In the Black Hills and the adjacent plains." D. A. Saunders (26).

Snowgarland Spirea

Spiraea multiflora, Zabel.
Spiraea arguta multiflora, Hort.

A hybrid **(Spiraea crenata** x **hypercifolia)** closely related to **Spiraea arguta,** but hardier and a little later in bloom. E. C. Hillborn, Valley City, North Dakota, finds the Snowgarland Spirea hardy and free-blooming.

Nippon Spirea

Spiraea nipponica.
Spiraea nipponica, Maximowicz.

A handsome shrub to 8 feet high, with upright spreading branches. Leaves dark green, remaining green until late in autumn. Flowers pure white in showy umbels. Native of Japan, first introduced to Europe from Japan as Spiraea rotundifolia alba. Winter-killed at this station.

Notha Spirea

Spiraea notha, Zabel.

"**Spiraea notha,** Zabel. A hybrid **(S. alba** x **corymbosa)** dwarf bush 2 feet in height, killing nearly to the ground in winter, but producing an abundance of pretty pink flowers on the ends of the young shoots from the first of July until frost." N. E. Hansen (9).

According to Rehder, **Spirea notha,** Zabel, is a hybrid **(Spirea corymbosa x latifolia);** originated before 1890.

Spiraea opulifolia lutea

Spiraea opulifolia lutea, Kirchn.
Physocarpus opulifolius var. luteus, Zabel.

"**Spiraea opulifolia lutea,** Hort. Golden-leaved Ninebark. This is a variety of the above species with golden yellow leaves changing to bronze as they become older. Kills back considerably but is worthy of cultivation, owing to its bright colored foliage in the spring." N. E. Hansen (9).

"A form with yellow leaves (f. luteus) known as Goldleaf Ninebark is planted to some extent in the state." Rosendahl and Butters, in "Trees and Shrubs of Minnesota" (23).

Spiraea oxyodon, Zabel

A hybrid **(Spiraea media** x **chamaedryfolia);** originated before 1884. A nearly smooth shrub, branches slightly angled; leaves serrate above the middle; flowers white. Hardy and free blooming.

It will be of interest to note the habitat of the parent species. **Spiraea chamaedryfolia,** Linn., native from East Europe to Siberia, Dahuria, Manchuria and Japan; **Spiraea media,** F. Schmidt, ranges from east Europe to Japan and Sachalin.

"**Spiraea oxyodon,** Zabel. Hardy and a profuse bloomer, the last half of May; flowers white, attractive. A hybrid **(S. flexuosa x media).** Height 5 feet, of strong growth." N. E. Hansen (9).

Spiraea pachystachys, Zabel

"**Spiraea pachystachys,** Hort. This is a hybrid **(Douglasii x Japonica callosa).** Height 1½ feet. Kills nearly to the ground every winter, but flowers freely on tips of young shoots in late June and July. Blossoms dark pink, pretty, but bush is too dwarf to make it of value, except possibly for low borders or in front of larger bushes." N. E. Hansen (9).

According to Rehder, this species is a hybrid **(S. corymbosa x Douglasii),** with light rose flowers; originated before 1878.

The lack of hardiness may be sought in the habitat of the parent species. **Spiraea Douglasi** is native of British Columbia to California; **Spiraea Japonica** is native of Japan and China.

Spiraea pruinosa, Zabel

Spiraea brachybotrys, Lange.
Spiraea luxuriosa, Lav.

A hybrid **(S. canescens x S. Douglasii),** similar to the **Fontenay Spirea**

but the leaves are densely tomentose beneath and the flowers pink. Winter-killed at this station.

Double Bridalwreath Spirea

Spiraea prunifolia plena, Hort.

Spiraea prunifolia flore pleno, Hort. Spiraea prunifolia Sieb. & Zucc. var. plena, schneid. Spiraea prunifolia, Zieb. & Zucc.

Native of Korea, China and Formosa.

"The double-flowered form is a handsome early-flowering shrub with dark green lustrous foliage turning orange in autumn; the single-flowered form is less showy and not much planted." Alfred Rehder, in "Manual of Cultivated Trees and Shrubs" (22).

Winter-killed at this station.

Reeves Spirea

Spiraea reevesiana.

Spiraea reevesiana, Lindl. Spiraea cantoniensis, Lair. Spiraea lanceolata, Poir.

Native of China and Japan. A smooth shrub with slender arching branches; flowers white, in dense umbels. Not sufficiently hardy at Brookings.

Willowleaf Spirea

Spiraea salicifolia.

Spiraea salicifolia, Linnaeus.

Spiraea salicifolia, Linn., the Bridewort of English gardens, is native of east Europe, Asiatic Russia to Japan. A shrub to 6 feet high, forming a dense thicket of erect stems, becoming quite smooth; flowers rose tinted white in dense erect terminal panicles, about 4 inches long and 2 inches wide at the base.

"As received from Germany, this bush kills back nearly to the ground and is too tender to be of value. The pink flowers appear during July." N. E. Hansen (9).

According to Rehder in Bailey's Cyclopedia of Horticulture (2) **Spiraea latifolia,** Borkh., and **Spiraea alba,** Dur., "have been referred by most American botanists to **Spiraea salicifolia. Spiraea alba** is chiefly found west, **Spiraea latifolia** east of and on the Alleghanies, while the true **Spiraea salicifolia** is an Old World species." See under **Spiraea alba** and **Spiraea latifolia.**

Sanssouci Spirea

Spiraea sanssouciana, K. Koch.

Spiraea regeliana, Hort. Spiraea Nobleana, Hook. Spiraea japonica paniculata, Hook.

A hybrid **(S. Douglasii x S. japonica);** originated before 1857. A shrub to 4 feet with pink flowers in broad panicles. Winter-killed at Brookings.

Arch Spirea

Spiraea schinabeckii, Zabel.

"**Spiraea schinabecki,** Zabel. **(S. chamaedryfolia x trilobata).** A hybrid variety with white flowers. Killed back one-half. Height two and one-half feet. The pretty white blossoms appear during June. Too tender." N. E. Hansen (9).

Perpetual Spirea

Spiraea semperflorens.
Spiraea semperflorens, Zabel. Spiraea fortunei semperflorens, Hort.

"Spiraea fortunei semperflorens, Hort.. A hybrid (S. Japonica x salicifolia.) Dippel classes this as S. semperflorens. Bush 4½ feet high with pink flowers on ends of young shoots. In severe winters this shrub kills back too much to be valuable. The blossoms appear early in July and continue till frost." N. E. Hansen (9).

Lilac Spirea

Spiraea syringaeflora, Lemoine.
Spiraea syringaeflora, Dieck.

A hybrid (Spiraea albiflora x salicifolia), with pink flowers. Originated before 1885. Winter-killed at this station.

Hardhack

Spiraea tomentosa.
Spiraea tomentosa, Linnaeus.

"Spiraea tomentosa, Linn. Native of North America, from Canada south to Georgia, west to Minnesota and Kansas. As received from Germany, kills to the ground every winter and is of no value." N. E. Hansen (9).

Hardhack is allied to the western Douglas Spirea but is distinguished by the thicker and browner felt beneath the leaves and by the later flowering.

"Tomentosa" refers to the woolly pubescence of the leaves and stem. The western type of Hardhack, or Steeplebush, is classified as Spiraea tomentosa, Linnaeus, var. rosea (Raf.) Fernalde, and is the one that should be tested.

According to Rosendahl and Butters, in "Trees and Shrubs of Minnesota" (23) this is "frequent, especially in low, acid soil in the northeastern part of the state, and as far south as the Twin Cities. New York to Minnesota, south in the mountains to South Carolina. All Minnesota specimens of this species appear to belong to the variety rosea. The typical species, found in the eastern part of the United States, has a more freely branched and more crowded inflorescence, with the individual flowers so closely packed that their pedicles cannot be seen, and densely lanate follicles, which are very tardily glabrate. Despite the name there is no color difference between the species and its variety."

The Minnesota native form of Hardhack should be tested under cultivation.

Threelobe Spirea

Spiraea trilobata.
Spiraea trilobata, Linnaeus. Spiraea triloba, Linnaeus.

A handsome bushy shrub, very hardy. Old specimens are 5 feet high at this station. Native from Turkestan and southern Siberia to Sungaria and north China. Leaves almost round, often three-lobed. A free bloomer, flowers pure white in many-flowered umbles.

According to Rehder in Bailey's Cyclopedia of Horticulture, this is cul-

tivated under many different names as, "S. aquilegifolia, S. adiantifolia, S. crataegifolia, S. Blumei."

Vanhoutte Spirea

Spiraea vanhouttei, Zabel. Spiraea aquilegifolia var. vanhouttei, Briot.
Spiraea vanhouttei.

Vanhoutte Spirea grows 6 feet high, with gracefully arching smooth brown stems.

According to Rehder, this is sometimes confounded with Spiraea trilibata, Linn., which is similar in every part, and less showy.

The Vanhoutte Spirea is a hybrid between Spiraea trilobata and Spiraea cantoniensis, originated by Mr. Billiard, a nurseryman near Paris, about 1862. The older shoots should be thinned out after flowering to give

Fig. 6.—SPIRAEA VANHOUTTEI—VANHOUTTE SPIREA
This is at the head of the list of all hardy shrubs for the lawn

light and air for the young shoots to develop. This Spirea may be closely sheared for a screen or hedge. The small leaves and slender graceful branches make such a hedge ornamental, but few flowers are produced when thus trimmed.

"Spiraea Van Houttei, Briot. Van Houtte Spirea. A hybrid (S. cantoniensis x trilobata.) The former is a native of China and Japan; the latter ranges from Turkestan and southern Siberia to Sungaria and north China. Originated in France, by Billiard. Height 4 feet, forming a dense mass of

foliage. A profuse bloomer in late May and early June. The white flowers are thickly set along the slender branches. All things considered, it is the most beautiful of all the Spireas and should be among the first of all ornamental shrubs chosen for the lawn. It sometimes kills at the tips but not enough to prevent its free flowering every year on the college grounds for the past ten or twelve years. It is doing well in Manitoba and North Dakota. The bush is easily propagated by planting cuttings out in the fall the same as currant cuttings, and also by dividing old bushes in early spring." N. E. Hansen (9).

"Spiraea **Vanhouttei** with its myriads of white clusters greets us early in the spring. With its graceful and pendulous growth makes fine individual specimens for show places and as a hedge is hard to beat." J. B. Taylor, Ipswich, S. D., 1917.

Common Snowberry

Symphoricarpos racemosus.

Symphoricarpos racemosus, Michaux. Symphoricarpos albus, Blake var. laevigatus, Blake. Symphoricarpos racemosus var. laevigatus, Fern.

"**Symphoricarpos racemosus,** Michaux. Snowberry. Native of Canada and the northern United States. In South Dakota it is found along streams and on dry banks throughout the state. A favorite in old gardens; the small pink flowers are followed by large white berries which hang on the plant through part of the winter. At the experiment station at Indian Head, Assiniboia, Canada, it has been found desirable for dwarf hedges and borders as it endures very severe trimming." N. E. Hansen (9).

The name **Symphoricarpos racemosus** is often misapplied to **Symphoricarpos racemosus laevigatus.** Native from Quebec to Washington, south to Virginia, Michigan and Montana, Idaho and California.

"The Snowberry commonly cultivated as **S. racemosus** is var. **laevigatus** while the plant sometimes grown as **S. racemosus** var. **pauciflorus** is typical S. **albus**; the true var. **pauciflorus**, Blake with smaller leaves and one to three flowers at the ends of branchlets is apparently not in cultivation. The Snowberry is chiefly planted for its white fruit in autumn and early winter." Alfred Rehder (22).

"**Symphoricarpos racemosus,** Michx. Snowberry. In the thickets along streams and on dry banks throughout the state." D. A. Saunders (26).

Few shrubs are better than the Common Snowberry for dark corners and shady places. Good cultivation pays in the greater size and abundance of the pure white fruit which often weighs down the branches in graceful arches. The Common Snowberry is distinguished by Fernald in Gray's Manual as **Symphoricarpos racemosus** var. **laevigatus.** The typical **Symphoricarpos racemosus** of Michaux is a dwarf shrub, 1 to 3 feet high, with leaves green on both sides and hairy beneath.

Western Snowberry

Symphoricarpos occidentalis.

Symphoricarpos occidentalis, Hooker.

"Native of North America from Oregon eastwards to Michigan. The Wolfberry has been confused with **Symphoricarpos racemosus,** but it is an inferior shrub with smaller duller fruits; it differs in the deeper-lobed

corolla and in the protruded style and stamens. Of little garden value." W. J. Bean (5).

"Wolfberry or Buck Brush (**Symphoricarpos occidentalis**, Hook.) A low shrub, found on low prairies and in thickets, with clusters of white berries in the axils of the upper leaves. Common throughout the state." Thomas A. Williams (28).

"Occasional in thickets in the Minnesota valley and in the Black Hills." D. A. Saunders (26).

Symphoricarpos is sometimes spelled **Symphoricarpus.**

Dwarf Snowberry

Symphoricarpos pauciflorus.

Symphoricarpos albus, Blake var. pauciflorus, Blake.

"The snowberry generally cultivated as S. **racemosus** is the var. **laevigatus**, while typical S. **albus** is sometimes grown as var. **pauciflorus**, but the true var. **pauciflorus**, Blake, is a low shrub with smaller leaves with grayish white pubescence beneath and only 1 to 3 flowers at the end of the branchlets; it is found from Lake Superior to Alberta and south to Colorado and Oregon, and is apparently not in cultivation." Alfred Rehder (2).

"Snowberry (**Symphoricarpos pauciflorus**, [Robins] Britton). A low shrub with small leaves and large, white berries. Black Hills. Valuable as an ornamental." Thomas A. Williams (28).

"On rich wooded bluffs in the Minnesota valley and in the Black Hills." D. A. Saunders (26).

Coralberry

Symphoricarpos vulgaris.

Symphoricarpos vulgaris, Michaux. Symphoricarpos parviflorus, Desf. Symphoricarpos Symphoricarpus, MacM. Symphoria glomerata, Pursh. Symphoricarpos orbiculatus, Moench. Symphoria conglomerata, Pers.

The Coralberry or Indian Currant is native from New Jersey to Georgia, Kansas and Texas, west to South Dakota. The leaves and fruit are retained late in the fall after severe frosts, making this one of the most ornamental of the genus. A desirable and hardy ornamental shrub.

"Indian Currant (**Symphoricarpos vulgaris**, Michx.) A low shrub found on rocky banks; berries small, red, in auxiliary clusters. East of the Missouri and most plentiful in the southeastern counties." Thomas A. Williams (28).

"**Symphoricarpos Symphoricarpus**, (L) MacM. Coralberry. **Symphoricarpos vulgaris**, Michx. On dry banks from the Missouri valley eastward." D. A. Saunders (26).

"**Symphoricarpos orbiculatus** differs from all the rest of the species here mentioned in having a downy style and red berries. These characters and the long array of short flower-spikes beneath the branches make it the most distinct of the cultivated members of this genus." W. J. Bean (5).

Coralberry "Indian Currant. Medium, dwarf and hardy. Slender branches, completely beaded with coral colored berries from autumn into winter." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Manchurian Lilac

Syringa amurensis.

Syringa amurensis, Rupr. Syringa rotundifolia, Decne. Syringa ligustrina, Hort. Syringa sibirica, Hort. partly. Ligustrina amurensis var. mandshurica, Maxim. Ligustrina amurensis, Reg.

Syringa amurensis, native of Manchuria, Korea and southeastern Siberia; a large round-topped shrub or small tree, attaining a height of 35 feet in its native home. The leaves are broad-ovate bright yellow-green above, pale yellow-green beneath; flowers creamy or yellowish white in large rather loose panicles.

Syringa amurensis was first found in 1875 by two Russians, Richard Maach and Karl Johann Maximoxicz who were traveling independently. This remarkable lilac is well worthy a place in the recommended list of hardy shrubs for South Dakota.

"Syringa amurensis, Rupr. Amur Lilac. Native of Manchuria and the Amur river region of Siberia. A hardy bush 6 feet in height with large glossy leaves and white fragrant flowers the last half of June. Habit not compact; probably trimming is needed to keep it in shape. Worthy of cultivation." N. E. Hansen (9).

These bushes are now 22 to 26 feet high and 25 to 28 feet across, and very free producers of huge panicles of white flowers the middle of June.

"When in bloom it is a handsome plant but, like the other tree-lilacs, suggests the privet rather than the plant usually thought of as a lilac. The main axes of the flower-clusters spread horizontally from the branch upon which they are produced while the subdivisions turn upward. For this reason the clusters appear to be flat-topped and the protruding stamens give them a feathery appearance. The fragrance is neither particularly pleasant nor yet unpleasant and suggests that of white clover. Hooker tells us that "in the Kew plant the flowers had a sweet heavy smell like those of privet;" it is to the fragrance of this plant that that of the flowers of the Amur Lilac is most often compared." Susan Delano McKelvey, in "The Lilac" (30).

Chinese Lilac

Syringa chinensis.

Syringa chinensis, Willd. Syringa rothomagensis, Loud. Syringa dubia, Persoon. Syringa vaxina, Dum-Cours.

A hybrid (S. persica x vulgaris), 12 feet high, with pointed ovate-lanceolate leaves. Flowers purple-lilac red or white, in large broad panicles. Rothomagensis is from Rothomagum, the old Roman name for Rouen.

"The Persian Lilac is then the greatest wanderer of all the species. It is interesting also as being, with the Common Lilac, parent of the first hybrid Lilac, S. chinensis, better known as S. rothomagensis, which appeared in the Botanical Garden at Rouen about 1777. Today this remains the handsomest of all the hybrid Lilacs." E. H. Wilson, in "The Lilac," Susan Delano McKelvey (30).

There are several varieties of this Chinese or Rouen Lilac. Syringa rothomagensis, var. rubra, Loud is referred by Rehder to Syringa rothomagensis, var. Saugeana, Rehd. It is also known as Syringa rothomagensis Saugeana, Loud.

"Whether Varin's Lilac was the original source whence came all plants of S. chinensis is uncertain; it is possible that the plant may have orig-

inated as a natural hybrid elsewhere. * * * That it should have occurred as a spontaneous hybrid in China is impossible, for, although S. **persica** is now known to grow wild in Kansu, China, the home of S. **vulgaris** is in the mountains of southeastern Europe and there is no proof that it had been introduced to China when S. **chinensis** was first described." The Lilac, Susan Delano McKelvey (30).

"This hybrid is one of the handsomest of all garden shrubs and if given sufficient room to develop forms a well-filled, large, somewhat hemispherical bush. The plant has not the upright, tall habit of S. **vulgaris**, the branches are less heavy and in winter the plant appears more 'twiggy'; in this respect, as well as in most other characters, it more nearly resembles the parent S. **persica**." "The Lilac." Susan Delano McKelvey (30).

S. **chinensis**, Willd, var. **Saugeana**, Rehder.—Syringa chinensis rothomagensis Saugeana, Loud. Syringa chinensis, var. rubra, Loud. This is a lilac-red variety of the Rouen Lilac.

"There appears to be no doubt that the forms Saugeana and rubra are the same. In 'Standardized Plant Names' (487, 1923) the two are kept distinct,—Saugeana, with approved common name of Purple Chinese, and rubra, with approved common name of Red Chinese. According to the generally accepted classification one of these names should be dropped.

"**Syringa rothomagensis rubra**, Loud. This is referred to S. dubia by Dippel. Sometimes called Chinese lilac. Origin not definitely known. A hardy bush 5½ feet in height, leaves small. The bush appears hardy, but the flower buds are too tender to give many blossoms." N. E. Hansen (9). These plants are now 8 feet high; of slender growth.

Syringa chinensis.—Syringa chinensis, Willd., var. Saugeana, Rehder. Syringa chinensis, var. rubra, Loud. Syringa chinensis rothomagensis Saugeana, Loud. This lilac-red variety is referred by Rehder to **Syringa chinensis**, Willd., var. **Saugeana**, Rehd.

Himalayan Lilac

Syringa emodi.

Syringa emodi, Wallich. Syringa villosa var. emodi, Rehder.

Native of western Himalaya to Kumaon; Afghanistan. A broad shrub up to 15 feet tall, with stout upright gray or olive-brown branches, inflorescence narrow, 3 to 6 inches long, with leafy bracts; flowers pale lilac or whitish, not pleasantly scented.

Concerning the distribution of **Syringa emodi** in Afghanistan E. H. Wilson, keeper of Arnold Arboretum, writes in "The Lilac" by Susan Delano McKelvey (30): "The other Himayalan species, S. **emodi**, is more widely distributed along the mountain range. Like its near relatives, S. **villosa**, S. **Wolfi**, and S. **Josikaea**, this is a woodland plant enjoying the cool of forest glades and margin of woodland streams."

In 1927 the four specimens of Himalayan Lilac were 8 feet high and 8 feet across, free bloomers and produced much seed.

Japanese Tree Lilac

Syringa japonica.

Syringa japonica, Decaisne. Syringa amurensis var. japonica. Nakai. Ligustrina amurensis var. japonica, Maxim.

According to Susan Delano McKelvey, in "The Lilac" Syringa japonica

is classified as a variety of the Amur Lilac; Syringa amurensis var. japonica (Maxim.) Franchet and Savartier. Native of Japan and differs from the typical Syringa amurensis mainly in its more tree-like habit, and larger size, up to 30 feet tall and later blooming season.

"A pyramidal tree, attaining a height of 30 feet, with upright branches. Flowers yellowish white in very large pubescent panicles, often 1 foot or more long. * * * Very desirable free-flowering tree and quite hardy north." Alfred Rehder (2).

"Syringa japonica, Done. Native of northern Japan and the island of Nippon. Of three specimens from Arnold Arboretum, planted in the spring of 1899, one winter-killed, the others are 2½ feet in height but kill back too much. They resemble Syringa villosa, but are not nearly as hardy. Another specimen planted in the spring of 1897, worked on common lilac, has produced a few large panicles of delicate white fragrant flowers, but the stock is strongly inclined to sprout." N. E. Hansen (9).

These seedlings are now 12 feet tall and 11 feet across, not in good condition, being in an unfavorable location and over-topped by a Siberian crab-tree. Those budded on common lilac were crowded out by the strong suckers from the stock. The Amur Lilac is evidently hardier.

Professor Sargent, director of Arnold Arboretum, in 1893 describes this plant in its native home: "Syringa japonica is rather common in the deciduous forests on the hills of central Yezo, and I saw it occasionally on the high mountains of Hondo. In its native country the Japanese Lilac, when fully grown, is an unshapely straggling tree, 25 to 30 feet in height, with a trunk rarely 12 or 18 inches in diameter, and does not display the beauty of foliage or the compact handsome habit which we associate with this plant in our New England gardens, where it is far more beautiful than in its native forests." "The Lilac" by Susan Delano McKelvey (30).

Ernest H. Wilson noted the distribution of this species as follows, in the monograph, "The Lilac" by Susan Delano McKelvey (30): "A few species have a wide distribution but the greater number are very local. The most widely distributed species are the Tree Lilacs, S. amurensis and S. pekinensis. The first-named is found as a large bush or small tree throughout the greater part of the Korean peninsula, adjacent Manchuria and in the region bordering the Amur river to the northward. It reappears on the mountains of Japan in the variety japonica, being found from Shinano province in central Hondo northward, and is abundant in Hokkaido where trees 45 feet tall are not uncommon."

Hungarian Lilac

Syringa josikaea.
Syringa josikaea, Jacq.

A shrub to 12 feet tall, branches upright, stout, greenish gray. Flowers lilac-violet, slightly fragrant. Valuable for its late blooming season. Native of Czechoslovakia, Rumania, Jugo-Slavia and Poland.

"Belonging to the same group of lilacs as **Syringa villosa** and **Syringa emodi,** this is inferior in many respects to both. Its flowers are of a deeper lilac than either. The leaves are whitish beneath, as in Syringa emodi, and of the same shape, 2 to 5 inches long." W. J. Bean (5).

These plants were not long-lived at this station because over-topped by some willows. Hardy at Ipswich much further north in the state.

Broadleaf Lilac

Syringa oblata.
Syringa oblata, Lindley.

Native of north China and Korea, from the provinces of Shensi and northern Hupeh, eastward to Korea. A shrub or small tree 13 feet high; leaves roundish ovate, often broader than long; flowers pale lilac to purple-lilac, in dense rather broad panicles. An early blooming shrub of compact habit, with handsome foliage, turning vinous red in autumn. The plants were not long lived at this station, but were crowded for room.

Peking Lilac

Syringa pekinensis.
Syringa pekinensis, Ruprecht. Syringa amurensis var. pekinensis, Maxim. Ligustrina pekinensis, Reg. Ligustrina amurensis var, pekinensis, Maxim.

Native of north China, in the provinces of Chihli, Shansi, Shensi, Honan, and Kansu. First described by Ruprecht in 1857. A handsome, large, slender, round-topped shrub, usually up to 15 feet tall, attaining a height of 40 feet in its native habitat, with a trunk over 2 feet in diameter.

"Syringa pekinensis, Rupr. Native of northern China. This specimen planted in the spring of 1899, received from Arnold Arboretum has made a strong hardy growth of 5 feet with attractive glossy leaves and white flowers in May and June." N. E. Hansen (9).

This specimen is now 27 feet high with a spread of 25 feet, producing a great abundance of large panicles of yellowish white flowers after other lilacs are gone.

"Large shrub, of excellent habit, with handsome foliage retained until late in fall; flowers profusely only when older." Alfred Rehder (2).

"In this country Syringa pekinensis is not so much cultivated as Syringa amurensis var. japonica, and, since both bloom at the same time, except for a situation where size is a determining factor, is not so desirable a plant. One finds it occasionally in Massachusetts gardens." Susan Delano McKelvey (30).

Persian Lilac

Syringa persica.
Syringa persica, Linnaeus.

The Persian Lilac is one of the most beautiful hardy shrubs for South Dakota. The flowers are very showy, not being hidden by the leaves. A shrub to 10 feet with slender arching branches; leaves lance-shaped, pointed; flowers pale lilac or whitish in rather dense broad panicles.

"Syringa persica, Linn. Persian lilac. Native of eastern Caucasus, Persia and the Orient. This bush is a very free bloomer in late May and early June; the small leaves distinguish it from the common lilac. A hardy shrub worthy of general cultivation." N. E. Hansen (9).

According to E. H. Wilson, the Persian Lilac "is now naturalized on the hillslopes of Persia, but no botanist has found it wild in that land. In 1620 the cut-leafed form of the species was known to be in cultivation in gardens at Venice." Susan Delano McKelvey (30).

The Persian Lilac was long a favorite among Asiatic peoples and must have been known from the earliest times.

"For a couple of centuries or more it was assumed to be native to Per-

sia. It was not until 1915 that the true home of this Lilac was made known. This proved to be on mountain slopes of southern and southeastern Kansu. It is interesting to note that the region is across the heart of Asia." E. H. Wilson, in "The Lilac" Susan Delano McKelvey (30).

It is probable that over this same road the lilac, along with the peach, apricot, silk, musk and rhubarb, were carried from China to Persia and the shores of the Caspian Sea.

Late Lilac

Syringa villosa.

Syringa villosa, Vahl. Syringa Bretschneideri, Lemoine. Syringa Emodi var. rosea, Cornu. Syringa pubescens, Hort., not Turcz.

A round-topped shrub of dense habit, up to 12 feet tall with upright sturdy, warty branches. Leaves broad elliptic to oblong, pointed at both ends, bright green and dull above, rarely smooth beneath. Flowers pinkish

Fig. 7.—SYRINGA VILLOSA—LATE LILAC
A choice lilac blooming later than the common lilac

lilac or whitish. Native of the provinces of Chihli, Shensi, and Shansi, in China. According to Rehder it extends south to the Himalayas.

"Syringa villosa, Vahl. Native of northern China and Mongolia. Three specimens planted in the spring of 1899, received from Arnold Arboretum, are now 4 feet in height. The large somewhat glossy leaves, and the nearly white and light purple, fragrant blossoms in early May and the first three weeks in June make it very distinct and ornamental. Bush not per-

fectly hardy but sufficiently so to give it place in the list of desirable shrubs." N. E. Hansen (9).

These specimens attained a height of 18 feet; of upright spreading habit, with very abundant flowers appearing much later than the common lilac. There are two colors represented, purple and white, in these seedlings.

E. H. Wilson in "Aristocrats of the Garden" (33): "Of the late-flowering Lilacs the best known in this country and perhaps the hardiest of all is Syringa villosa, a native of northern China. * * * It is a large shrub of excellent habit with erect, fairly stout branches and oblong-lance-shaped, rather pale green leaves. The flowers are rose-colored, pink, or nearly white, but they have an unpleasant odor. It is, however, a first-rate shrub, exceedingly floriferous, and very valuable for its hardiness and for its late flowers."

"Large clusters of pale pink or flesh-colored flowers are exceedingly showy and handsome. The flowers fade almost white. The species is "tidy," with few twigs, and rarely any dead wood, and is one of the hardiest of all lilacs. The odor of the flowers frequently noted as objectionable, is not, in the open at least, so disagreeable as to warrant the plant's exclusion from the garden. Its flowering period follows that of Syringa vulgaris and its forms, and prolongs the lilac season by about two weeks. To develop properly a plant of Syringa villosa should be given plenty of room,—a radius of 10 feet is none too much,—for much of the beauty of the species exists in its fine symmetrical habit." Susan Delano McKelvey (30).

The name villosa (hairy) is not appropriate, since the leaves are green and glabrous (smooth) on the sides, except on the lower part of the midrib. Syringa villosa was first discovered by the Frenchman, Pierre d'Incarville, a Jesuit missionary, in the mountains near Peking. Father d'Incarville was a pupil of the great French botanist Bernard de Jussieu to whom he sent a collection of dried plants and seeds of the Peking flora, toward the middle of the eighteenth century. The species was first named by Vahl in 1805.

Common Lilac

Syringa vulgaris.
Syringa vulgaris, Linnaeus.

The Common Lilac is a large shrub or small tree to 25 feet or rarely taller; with flowers usually lilac in color, delightfully fragrant, in pyramidal panicles 6 to 8 inches long, in the improved French varieties 12 to 18 inches long.

According to Susan Delano McKelvy, in "The Lilac" (30) the Common Lilac is "native of southeastern Europe, chiefly in the mountainous regions; Roumania, Jugo-Slavia; Bulgaria and Greece."

Linnaeus, in 1748, gave its habitat as Persia, but there is no proof that it ever grew there as a wild plant.

"Syringa vulgaris, Linn. Lilac. Native of central Europe and the Orient. Under cultivation the lilac of old-fashioned gardens has varied greatly and a very large number of varieties are now in cultivation. One eastern nursery offers about sixty varieties. Dippel divides them into five groups according to the flowers: 1. Purple; 2. Light colored; 3. Blue; 4. White;

5. Double. The variegated-leaved varieties are mentioned as undesirable and not constant, generally reverting to the green-leaved type. Of the single varieties, the following have been tested at this station: Alba grandiflora, alba pyramidalis, Andenken an Ludwig Spaeth, aurea, Doktor Lindley, Doktor Nobbe; Eckenholm, Frau Bertha Dammann, Geant des Batailles, Goliath, Justi, Lovaniensis, Madame Briot, Madame Moser, Princesse Marie, Prinze Notger, rubra Trianoniensis, Schneelawine, Siberica. Of the double-flowered varieties (**Syringa vulgaris fl. pl.**): Leon Simoni, Mathieu de Dombasle, Michel Buchner, Renoncule, Tournefort.

All of these have proved hardy. Many are grafted on ordinary lilac stocks which are strongly inclined to sprout, thus giving two kinds of flowers in the clump, but the sprouts rob the grafted variety if not removed. Sometimes these lilacs are worked on privet stocks (Ligustrum), but such would be liable to root-killing here. Of the sorts named above, the following have done especially well. Andenken an Ludwig Spaeth, Frau Bertha Dammann, Goliath, Madame Moser, Schneelawine, Mathieu de Dombasle, Michel Buchner, Renoncule. But choosing a list is largely a matter of individual taste, and after all the old fashioned lilac with bluish-purple fragrant flowers in late May and early June, the parent of the improved sorts, is still very worthy of a place on every lawn." N. E. Hansen (9).

"Syringa vulgaris. The lilac (**Syringa vulgaris**), one of the most common and well known of all flowering bushes, does not hold a position of so high esteem as it deservedly should. This may be, and probably is, due to the scarcity and inferiority of the blossoms, for the simple reason that perhaps nine-tenths of the total number are set in thick sod and never given a thought or care thereafter. Everyone set out a few, cultivate and mulch them, and note the results: there will be magnificent flowers and in abundance. The bush, ten to twelve feet high, bears its flowers in large tapering clusters of lavender or white, which cannot be surpassed in fragrance and beauty. The foliage is thick and dark green, making a fine hedge, which is very desirable for the background of nearly every lawn. Its value as single specimens is evident to anyone who has seen a well cared for bush in full bloom." E. G. Sanderson, Brookings, S. D., in South Dakota State Horticultural Society Report, 1904.

Since 1901 many other varieties of Lilacs have been tested at this station. This list includes Rouen, Emile Lemoine, insignis rubra, Princess Marie, Charles X, Virginal, grandiflora alba, Bretschneider (a synonym of Syringa villosa), Belle de Nancy, Mme. Lemoine Siberian White Lilac (a synonym of Syringa chinensis), Professor E. Stoekhardt. There are other varieties which cannot be verified at this writing. All of these varieties have flowered freely.

The Common Lilac attains large size with age, where space is available for full development. At this station, a specimen of the Great White Lilac (**Syringa alba grandiflora**) is now 20 feet high and with a spread of 20 feet; very hardy, of strong growth and a free bloomer. The earliest mention of this variety is in a French catalog, 1831.

On a private lawn in Brookings there is one specimen of White Lilac 23 feet high and 23 feet across; and a Purple Lilac 24 feet high and 25 feet 4 inches across; these were planted about 50 years ago.

Probably more than 200 varieties are listed at the present time as obtainable in the nurseries of America and Europe. More than 600 varieties

of Common Lilac are listed in "The Lilac" by Susan Delano McKelvey. Two of the best collections of Lilacs in America are in the Arnold Arboretum, Boston, and in the City park of Rochester, New York. The new city parks should make a collection of lilacs, both botanical species and cultivated varieties. It would attract thousands of visitors in Lilac season. A hedge of lilacs would enrich the farmstead at low cost, and add greatly to the value of the farm.

New varieties of Lilacs are coming out every year. The main task now is to select the best few. It would be of great interest to make a complete collection of Lilacs and when that is made a special Monograph of the Lilac can be prepared. The improved lilacs cannot be neglected by those who wish to have a good collection of ornamental shrubs.

Canada has a large national collection of Lilacs at the Dominion of Canada Central Experimental Farm, Ottawa. There are many private lilac collections of smaller size. A good collection of the best Lilacs, old or new, somewhere in South Dakota, would attract national as well as statewide interest.

The Lilac in North Central South Dakota

The Lilac—A Good Ornamental Shrub. J. B. Taylor, Ipswich, S. D.

"For an ornamental shrub that will stay with us I would place the Lilac family foremost. It is absolutely hardy, has few enemies and has a tenacious disposition to get on some way. It will stand any amount of neglect and on many an abandoned farmplace is the only shrub that outlasts the plantings made.

The old common purple still has its place for heavy or background planting and while it is rather a tardy blossomer, the blossoms when they do come repay one for the delay.

The common white is not as profuse a bloomer but is as heavy a grower and will reach 10 or 12 feet high with 5 or 6 years if given a favorable location and well cared for.

Persian is one of the real dainty well-shaped lilacs and blossoms much earlier in life. I have two colors, the light lilac color and nearly a white or which fades out quite light within a short time when in blossom.

The newer European lilacs are wonderful and with their many hues and shades will please anyone's fancy. Ludwig Spaeth is one with purplish red blossom and contrasts so nicely with Madame Lemoine, a large beautiful white.

Then the blues like President Grevy are gorgeous and we all know that these colors, red, white and blue, are the most beautiful colors in the world.

Josikaea and Villosa are two good purple and both make a stocky growth, Charles the Tenth (Charles X) is a good blue and is a good grower. Senateur Volland with its rosy colored blossoms adds variety.

The heaviest or the largest I have is the Chinese tree lilac and it does make quite a tree provided it is trimmed up so as not to spread out too much. This makes a wonderful background, heavy shrub or a lawn tree as it will grow when once established and which so many shrubs will not do when lawn grass crowds around it as there is nothing that takes up moisture like blue grass. All have the lilac scent and what sweet memories a lilac leaves. It invariably awakes pleasant incidents of youth and the old home place and is the shrub that associates with it all the good things of life. Hard sometimes to describe but the perfume is always remembered

and no other of the vegetable kingdom can claim it." Annual Report of South Dakota State Horticultural Society, 1925.

Lilacs in Western Minnesota

"Scarcely anything equals the lilacs for prairie planting. Perhaps the best is the old fashioned **Syringa vulgaris.** There is a white variety of this but it is not quite so floriferous. The variety known as Charles X has larger flowers. **Syringa rothomagensis** is very fine too. Nurserymen generally call this the Persian lilac. Another very fine lilac is sold as **Syringa chinensis.** There are many desirable hybrids, but these should be propagated on their own roots in order to give satisfaction. A very late lilac is **Syringa Josikaea.** A very late and tall lilac is **Syringa villosa,** while **Syringa Japonica** is a fair sized tree." L. R. Moyer, Montevideo, Minnesota (18).

"If the town is in a hilly location and there are banks of raw earth anywhere to be covered, there is nothing better than lilacs to cover them. They will grow on a very steep slope if care is taken to set them in the lower angle of V-shaped ditches to lead the water that falls on the slope toward them. And when they are in bloom people will stop and wonder at their beauty." L. R. Moyer, Montevideo, Minnesota (18).

Amur Tamarix

Tamarix amurensis.

Tamarix amurensis, Hort. Tamarix pentandra, Pall. Tamarix pallasii, Desvois. Tamarix hispida aestivalis, Hort.

There are about 75 species of **Tamarix** (Tamarisk, the common name) native of the Mediterranean region to east India and Japan. A shrub or small tree, attaining a height of 16 feet, with purple branches. A variable species.

According to "Standardized Plant Names" (1) Amur Tamarix is a horticultural variety of **Tamarix pentandra.** This species was named by Pallas, 1741–1811, a German professor and explorer in Russia.

"**Tamarix amurensis,** Hort. Amur Tamarix. This beautiful shrub was imported by Professor Budd, from Russia. This name is a nursery name under which it has become widely known in the west and needs be retained for the present. This shrub has done well for the past ten years on the station grounds on the south side of the Main building. Although killing back nearly or quite to the ground every winter, it sprouts vigorously every spring. The slender graceful shoots with silvery cedar-like foliage give it an unique appearance. The small spikes of pink blossoms are in long panicles and appear in July on the tips of the young growth. The plant is easily propagated by cuttings planted in the fall. We find that young plants should be mulched the first few winters until well established; further south the shrub should be pruned severely every spring to give an abundance of young shoots which constitute its chief beauty." N. E. Hansen (9).

The Amur Tamarix is propagated like willows, from cuttings. "This beautiful tamarisk is quite hardy, and one of the most pleasing of late-flowering shrubs. It should be planted in groups large enough for its soft rosy plumes to produce an effect in the distance. To obtain it at its best, it is necessary to cut it back every winter almost to the old wood. It then sends up the long slender branches which flower for six weeks or so in August and September." W. J. Bean (5).

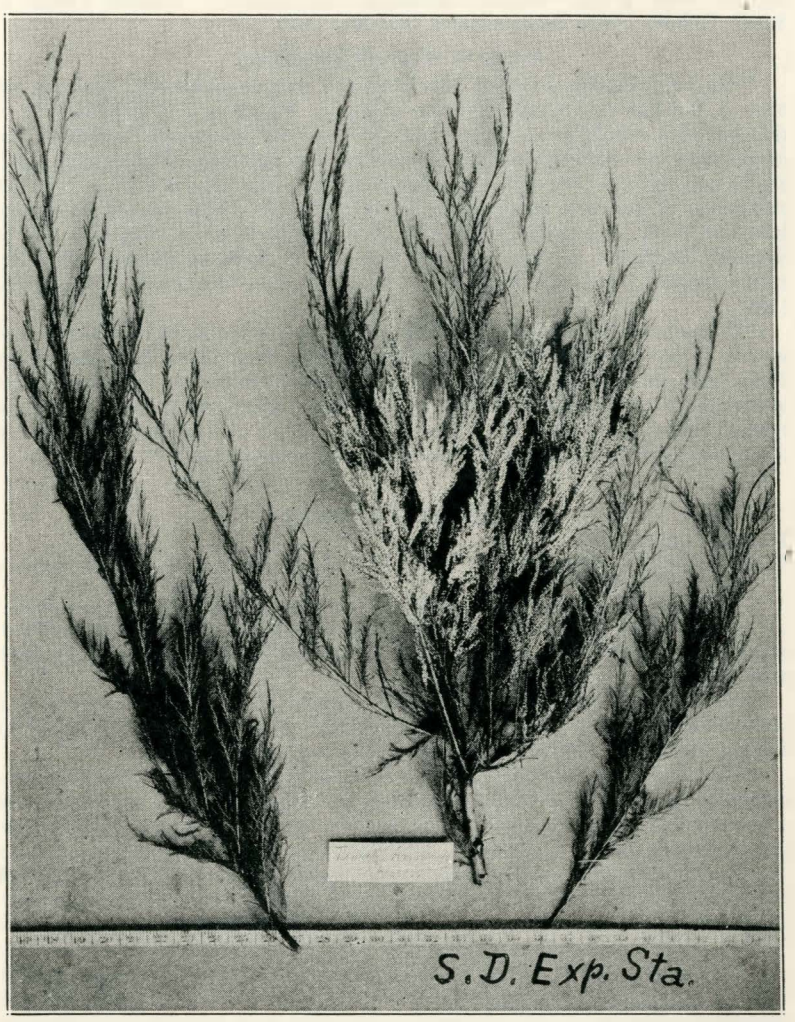

Fig. 8.—TAMARIX AMURENSIS—AMUR TAMARIX
Excellent for adding variety to shrub planting

Highbush Blueberry

Vaccinium corymbosum.
Vaccinium corymbosum, Linnaeus.

Native from Maine to Minnesota, south to Florida and Louisiana, in swampy and moist soil. A shrub to 13 feet, with spreading branches and blue-black edible fruit. Winter-killed at this station.

European Whortleberry

Vaccinium myrtillus.

Vaccinium myrtillus, Linnaeus. Vaccinium membranaceum, Dougl. Vaccinium macrophyllum, Piper. Vaccinium myrtilloides, Hook., not Michaux.

Vaccinium myrtillus, Linnaeus (Whortleberry or Bilberry) is a low shrub with black edible berries, native of the mountainous regions of Europe, Asia and possibly North America.

The American type as found in South Dakota, has been noted by Williams and Saunders.

"Small-leaved Whortleberry **(Vaccinium myrtillus microphyllus,** Hock). A low shrub with angled, green branches, small, shining leaves and red or finally blackish berries. Shady hillsides near Lead city." Thomas A. Williams (28).

"**Vaccinium myrtillus microphyllum,** Hook. Bilberry, Whortleberry. In the Black Hills." D. A. Saunders (26).

American Cranberrybush

Pembina

Viburnum americanum.

Viburnum americanum, of Authors, not Miller. Viburnum trilobum, Marsh. Viburnum opulus, var. americanum, Ait.

A handsome shrub attaining a height of 13 feet. Trilobum, three-lobed, refers to the leaves. Native from New Brunswick to British Columbia, south to New York, Michigan, South Dakota, and Oregon. In Minnesota, common in the northern part of the state.

"This species seems sufficiently distinct from the European **Viburnum opulus** of which it is usually regarded as a variety. Besides the differences in the shape and pubescence of the leaves there are marked differences in the calyx and in the stone of the drupe. Specimens from the Pacific coast appear to belong to **Viburnum opulus,** rather than to **Viburnum trilobum.**

The fruit is used for making sauce and preserves. "Pembina borne first by a river, and then given to the town and county is stated by Keating to be from the Chippewa word for this fruit, anepeminan, which name has been shortened and corrupted into Pembina."—Upham, W., Flora of Minnesota." "Trees and Shrubs of Minnesota," Rosendahl & Butters (23).

"This may be distinguished from the preceding **(V. lentago, L.)** by its three-lobed leaves and globose, red fruit. Black Hills. Rare. The Snowball is a cultivated form of this species." Thomas A. Williams (28).

"In damp ravines in the Minnesota valley (rare) and in the Black Hills." D. A. Saunders (26).

"Reported as growing in the Minnesota valley in Roberts county and from Bear Butte valley and Custer Peak in the Black Hills. Also known as the high-bush cranberry and has been planted in parks and yards for ornamental purposes." W. H. Over (19).

As received from Manitoba the Pembina is very hardy and fruitful at this station. Plants have been collected by the writer in the Turtle mountains of North Dakota with the aim of improving the fruit in size and quality.

Cranberry Tree

Viburnum opulus.—"A tall, nearly smooth shrub with gray bark and red scaly buds; three- to five-ribbed leaves which have lobes; pointed and sparsely toothed. The cymes of cream colored flowers which frequently turn pink on maturity are peduncled. The juicy, acid bright red, oblong fruit are about one-half inch long with a flat pit.

This plant which retains its aromatic fruit until late into the autumn, is common in our woods as far north as Wintering lake and although the size of the shrub diminishes at that latitude the size and quality of the fruit is not noticeably different to that found so plentifully in the Red River valley.

The fruit has at times been used as a substitute for Cranberries, hence the popular name, "High Bush Cranberry." It is used in pie-making, for jelly and cranberry-butter.

As seen at experimental farms this tree gives larger fruit on cultivated land. The principle "Excess of food causes variation" holds true on this case and by selection the fruit should become an important garden crop." W. R. Leslie (17).

Fragrant Viburnum

Viburnum Carlesi.

Viburnum Carlesi, Hemsl.

A much-branched shrub to 4 feet, flowers very fragrant. Native of Korea. First introduced to Europe in 1902. "It is undoubtedly one of the most delightful of Viburnums, not only for the beauty of the flowers, but for a fragrance unrivalled for sweetness in the genus" (5).

"A new rare Viburnum many branches with very fragrant bell-shaped flesh-pink flowers in April and May. For protected places." G. B. Tuthill, Sioux Falls, South Dakota, 1931.

Withe-Rod Viburnum

Viburnum cassinoides.

Viburnum cassinoides, Linnaeus. Viburnum nudum var. cassinoides, Torr. & Gray. Viburnum squamatum, Willd.

An upright, handsome shrub to 14 feet, with yellowish white flowers and blue-black fruit.

"**Viburnum cassinoides**, Linn. White rod. Appalachian Tea. Native of eastern North America, from Newfoundland to the Saskatchewan and from New England to New Jersey and Pennsylvania. Of three specimens from Arnold Arboretum, one winter-killed and the others are alive, from one to two feet but killed nearly to the ground." N. E. Hansen (9).

These specimens are now all gone. The original source of these plants was not determined. An effort should be made to obtain the Manitoba and Saskatchewan form of the species.

Viburnum cotinifolium, D. Don.—This plant is not listed in Standardized Plant Names.

A shrub 6 to 12 feet high with young branchlets under surface of the leaves and flower stalks, covered with dense gray stellate down. The leaves are round-ovate to ovate; the upper surface is slightly tomentose. Fruit black.

"**Viburnum cotinifolium,** Don. Native of Nepal. Bush 2½ feet in height, rough hairy gray-green leaves. Of four specimens, two winter-killed and

the others are alive but kill at tips. Distinct and ornamental." N. E. Hansen (9).

These plants have made a strong growth and are now 12 feet high, with a spread of 12 feet. They are remarkable for holding their leaves late after severe frosts. October 26, 1927, leaves were still untouched by frost. A very desirable shrub for autumn effect either for hedges or as single specimens.

Arrowwood

Viburnum dentatum.
Viburnum denataum, Linnaeus.

A handsome upright bush, attaining a height of 15 feet, with smooth branches, conspicuous white flowers and blue-black fruits.

Arrowwood is so called because the smooth erect shoots that spring from the base were used by the Indians as arrows.

"**Viburnum dentatum,** Linn. Native from New Brunswick to Michigan and south to Georgia. Of five specimens from Arnold Arboretum planted in the spring of 1899, two winter-killed; three are now 1½ feet high but kill back one-half." N. E. Hansen (9).

Wayfaring-Tree

Viburnum lantana.
Viburnum lantana, Linnaeus.

Native throughout Europe and extending to western Asia. A vigorous shrub, attaining a height of 12 to 15 feet, with young shoots, buds, lower leaf-surface, and flower stalks, all covered with a dense coating of pale down. Flowers white in dense cymes; fruit bright red, changing to nearly black.

"**Viburnum Lantana.** 10 to 15 feet. Beautiful wrinkled Lantana-like leaves; white flowered in May and June. Fruits color unequally from crimson to black, causing a most charming combination of colors throughout the summer. Good in shady locations." D. B. Gurney, Yankton, S. D., 1929.

"**Viburnum** lantana, Wayfaring Tree. Frequently cultivated and perfectly hardy. Introduced from Eurasia. Blossoms in May, fruit ripe in August." Rosendahl & Butters (23).

Nannyberry

Viburnum lentago.
Viburnum lentago, Linnaeus.

The Nannyberry or Sheepberry is a vigorous shrub, or small tree, attaining a height of over 30 feet. The leaves are ovate or obovate, pointed, finely and sharply toothed, dark shining green above, smooth above and beneath except on the midrib above. Flowers creamy white with a pleasing fragrance.

"Sheepberry (**Viburnum lentago,** L.) A medium-sized shrub with pointed, sharply-toothed leaves, white flowers and large, oval black berries with a bluish bloom. Common in the Sioux valley, Big Stone and lower Missouri valley regions and in the Black Hills." Thomas A. Williams (28).

"Common on wooded banks in the Minnesota valley and in the Black Hills; occurs also near Sioux Falls and in the Sioux valley." D. A. Saunders (26).

"**Viburnum lentago,** Linn. Nanny-berry, Sheep-berry, Sweet Viburnum, Black Thorn. Native in rich soil from Hudson Bay to Manitoba, south to Georgia, Indiana and Missouri. Native in South Dakota, in the Minnesota and Sioux valleys and the Black Hills. As received from Manitoba this has not yet fruited but is a handsome hardy shrub with long gray sharp-pointed buds. The fruit is sweet and edible." N. E. Hansen (9).

This shrub has proved hardy and a very free bloomer at this station for many years. A real high quality shrub for the lawn.

"Black Haw. **Viburnum lentago** is native to the edges of groves in the prairie regions. It has beautiful shiny leaves, quite showy flowers and interesting black fruit." L. R. Moyer, Montevideo, Minnesota (18).

Kentucky Viburnum

Viburnum molle.
Viburnum molle, Michaux. Viburnum demetrionis, Deane & Robins.

A shrub with bark peeling in thin flakes, and light gray branches; attaining a height of 13 feet; native from Iowa to Kentucky and Missouri. Winter-killed at this station.

European Cranberrybush

Viburnum opulus.
Viburnum opulus, Linnaeus.

"**Viburnum opulus,** Linn. High Bush Cranberry. Native throughout Europe; in northern Asia and Siberia; and in low grounds from New Brunswick to British Columbia south to New Jersey, Michigan and Oregon. In South Dakota, in the Minnesota valley and in the Black Hills. A handsome shrub with white flowers; the red berries are used in the Dakotas and Manitoba for jelly and sauce. The plant varies in hardiness. Of five specimens from Arnald Arboretum in spring of 1899, three winter-killed and two are alive, but kill back severely. As received from Cavalier, North Dakota, hardy at this station. A plant worthy of attention, being both useful and ornamental." N. E. Hansen (9).

The European Cranberrybush or High Bush Cranberry, **(V. opulus)** is now distinguished from Pembina, the American from **(V. trilobum)** which is noted in Standardized Plant Names as **Viburnum americanum** (1).

The European Cranberrybush has one advantage in ornamental planting because the fruit is bitter and is not taken so much by the birds, while the fruit of the American Pembina in edible and eagerly sought for by the birds, and also used for culinary purposes.

In Europe, **Viburnum opulus** is called Guelder Rose and attains a height of 15 feet. The flat cymes or flower-clusters have a center of small fertile flowers and a border of sterile showy white flowers; fruits are bright red, nearly round. At Brookings the branches of this European form **Viburnum opulus,** kills back considerably and is not recommended. The northwestern form of Pembina is much better.

"The Snowball and the High Bush Cranberry go hand in hand and are prolific blossomers giving us white, ball-shaped flowers that are always welcome." J. B. Taylor, Ipswich, S. D., 1917.

Common Snowball

Viburnum opulus sterile.
Viburnum opulus var. sterile, De Candolle.

"**Viburnum opulus sterile,** Hort. Snowball. A sterile-flowered form of the preceding. (**Viburnum opulus.**) The old-fashioned Snowball still retains its popularity. At Brookings it is hardy, but should be watered in dry falls before winter sets in." N. E. Hansen (9).

"**Viburnum opulus,** Linn., var. **sterile,** De Candolle. The Snowball Tree. In this form all the flowers are of the large sterile kind, and the cyme becomes in consequence transformed into a globose head of white closely packed blossom, 2 to 2½ inches across. This is one of the most beautiful of hardy shrubs, but of course the fruiting beauty of the common Guelder rose is sacrificed. It is supposed to have originated in the Netherlands, but has been known in English gardens since the sixteenth century, and possibly before. Easily increased by cuttings. There is a rosy-tinted form of it called Roseum." W. J. Bean (5).

Sargent Cranberrybush

Viburnum sargenti.
Viburnum sargenti. Koehne. Viburnum pubinerve, Bl. Viburnum opulus var. sargenti, Takeda.

Similar to Pembina but of more upright denser habit and the stems darker fissured and somewhat corky. Native of north China and Japan. This specimen is now 6 feet high, of erect habit, with much dead wood in it. Not entirely hardy.

Doublefile Viburnum

Viburnum tomentosa.
Viburnum tomentosum, Thunberg.

A shrub to 10 feet high, with almost horizontal spreading branches. Native of Japan and China. **Viburnum tomentosa** winter-killed at this station. The Japanese Snowball, **var. plicatum,** is a variety of this species; not tested at this station.

Downy Viburnum

Viburnum venosum.
Viburnum pubescens, Pursh.

A handsome shrub attaining 10 feet in height, with lower surface of leaves densely pubescent. Flowers white; fruits blue-black.

"**Viburnum affine** var. **hypomalacum,** Blake; abundant throughout the region of conferous forests, rare farther south, as far as the Minnesota valley. Vermont to Manitoba, south to Maryland, Michigan, Minnesota, and in the mountains to Georgia." Rosendahl and Butters, "Trees and Shrubs of Minnesota" (23).

The Downy Viburnum in Manitoba

Viburnum pubescens, Downy Leaved Arrowwood.—"A low, straggling shrub, with ovate to oblong acutely pointed leaves having few but very

coarse leaves. The lower surface of the leaves and the very short petioles are soft downy.

It is common in our western thickets but does not command much interest except as an ornamental shrub." W. R. Leslie (17).

Yellowroot

Zanthoriza apiifolia.

Zanthoriza apiifolia, L. Her.

Native from New York to Florida.

"Also spelled Xanthoriza. Handsome cut leaf foliage, yellow in autumn, red fruit. One of the best shrubs for any situation. Invaluable to plant in as an undercover among trees where other plants do not thrive." G. B. Tuthill, Sioux Falls, S. D., 1931.

Climbing Vines of South Dakota

Virginia Creeper

Ampelopsis quinquefolia.

Ampelopsis quinquefolia, Michaux. Parthenocissus quinquefolia Planch. Vitis quinquefolia, Lam. Ampelopsis hederacea, DC. Ampelopsis virginiana, Hort.

"A hardy climber with compound five-follate leaves which turn crimson in autumn, and small, blackish berries. Found in wooded places throughout the state. A valuable ornamental." Thomas A. Williams (28).

"Common along streams and bordering lakes from the Missouri river eastward; the Minnesota and Sioux valleys, and in the Black Hills." D. A. Saunders (26).

"Native of the United States east of the Rocky mountains. This is probably our best ornamental climbing vine for covering porches and arbors. As transplanted from the woods of South Dakota this is found hardy throughout the state. Caution should be exercised in buying vines from the nurseries to prevent getting southern or eastern forms of this species. Four forms of this species imported from Germany and planted in the spring of 1896 viz: **hirsuta, latifolia, serrata** and **Engelmanni**, are evidently tender forms of this species, as they kill back some every winter, while plants from the woods in this vicinity prove perfectly hardy. In Germany and other parts of Europe it is very largely planted. The plates are from photographs taken by the writer in the garden of a Russian prince in August, 1894, and will indicate its decorative possibilities in the hands of skillful planters. Several other varieties are described in Bailey's Cyclopedia, two of which cling firmly to walls. The species is evidently quite variable and South Dakota woods should be explored for desirable varieties of this, our native substitute for the ivy. In the west, the Virginia Creeper is sometimes, though erroneously, called Woodbine. Virginia Creeper has five leaves while the poison ivy has three. Poison ivy should be destroyed as a vile weed whenever possible." N. E. Hansen (9).

"One of the most common plants in the parks of Germany is our Virginia Creeper (**Ampelopsis quinquefolia**). It is seen everywhere and is used in many ways. It is climbing the walls, is used as garlands and festoons between iron posts, to cover iron fences, to cover arbors, as a border for shrubbery and flower beds, etc. Although a favorite with me from

childhood I had not dreamed of the decorative possibilities of this hardy American climber. I found it equally popular in Denmark and Sweden. Even in the most crowded streets I found it extensively used as a screen, and as planted in large elevated boxes with a trellis above. I found many grand specimens of it in the Royal gardens of Copenhagen." N. E. Hansen, 1894.

This species varies greatly and there are a number of varieties in cultivation. Very useful in covering walls and tree trunks as it clings of itself with expanded adhesive tips; the old stems often send out roots. There

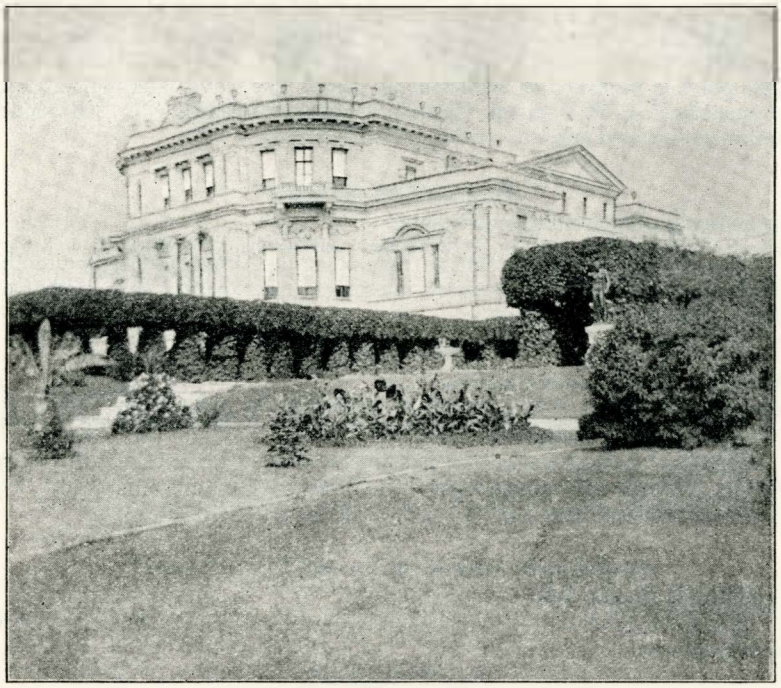

Fig. 9.—VIRGINIA CREEPER
A native South Dakota climbing vine, in the garden of a Russian prince. Photo by N. E. Hansen, in southern Russia, 1894

is a closely allied species, **Ampelopsis vitacea**, Hitch., Thicket Creeper, a species lacking the sucker discs on the tendrils and therefore unable to climb on walls. It is native from eastern Canada and New England and from Michigan south to Texas. This occurred in England and later the true self-climber was introduced under the name **Muralis** and **Engelmanni.**

The Virginia Creeper in Manitoba

Ampelopsis quinquefolia. Virginia Creeper. False Grape.—"A high climbing or trailing woody vine. The numerous tendrils are provided with

terminal expansions or disks, which adhere to objects. Leaves are digitately, 2-foliate with leaflets oblong-lanceolate, 2 to 6 inches long, coarsely toothed from the middle to the apex, pale beneath, dark green above. The ample panicles are erect, spreading in fruit. The blue berries, one-half inch in diameter, having two to three seeds. The peduncles are red and the leaves turn a bright red in Autumn.

This hardy plant is very plentiful in the Red River valley.

The Sioux collected the ripe fruit and ate it like grapes. It is questionable whether the fruit grower will ever make any use of it other than a cover for his arbor, but it may have a function with the development of our grapes. "Native Fruits of Manitoba."

"**Psedera quinquefolia** (L.) Greene. Virginia Creeper. Common from New England to the Rocky mountains, especially east of the Missouri river. This plant is regarded as poisonous by some. The leaves and fruit abound in raphides." L. H. Pammel, Manual of Poisonous Plants (21). (Raphides are needle-shaped crystals in the cells of plants.)

Engelmann Creeper

Ampelopsis quinquefolia engelmanni.

Ampelopsis engelmanni, Graebn. Parthenocissus quinquefolia, var. Engelmanni, Rehder.

A variety with smaller foliage than the true **Ampelopsis quinquefolia.** Now common in the northwestern nurseries. An excellent self-climber on walls. Hardy at this station.

Hairy Creeper

Ampelopsis quinquefolia hirsuta.

Ampelopsis quinquefolia hirsuta, Planch. A. quinquefolia var. radicantissima, Rehd. Parthenocissus hirsuta, Small. Ampelopsis hirsuta, Donn. A. Graebueri, Bolle. A. pubescens, Schlect. A. radicantissima, Hort.

A distinct variety sometimes classified as a separate species, with hairy shoots, leaflets and inflorescence; the young leaves usually bright red. Native of southeastern United States. Not hardy at this station.

Ampelopsis quinquifolia latifolia, Tausch.

Ampelopsis Roylei, Hort.

A large leaved variety, imported from Europe. Not sufficiently hardy at this station.

Dutchmans-pipe

Aristolochia sipho.

Aristolochia sipho, L. Heritier. Aristolochia macrophylla, Lam. Aristolochia durior, Hill.

A strong climber, native from Pennsylvania and Georgia west to Minnesota and Kansas. An excellent vine for porches owing to its large heart-shaped leaves, 4 to 10 inches long, which afford a dense shade. The leaves are free from fungus and insect attacks. The yellow green and purple flowers are tubular and inflated, bent like a siphon, resembling a Dutch pipe. This is found hardy at Sioux Falls and Brookings.

Chinese Trumpetcreeper

Bignonia grandiflora.

Tecoma grandiflora, Loisel. Campsis chinensis, Voss.

Native of China and Japan. A climbing shrub with large showy **scarlet** or orange-red flowers, 2 inches across, in terminal racemes.

"Less high-growing and sometimes shrubby; blooms when quite small and can be grown as a pot-plant, also suited for forcing." Alfred Rehder, Bailey's Standard Cyclopedia of Horticulture (2).

"**Bignonia Grandiflora** has been blooming every year for the last 25 years. I first saw this vine in the Botanical Gardens at Washington when it happened to be at its very best. I got a few plants and put them on a

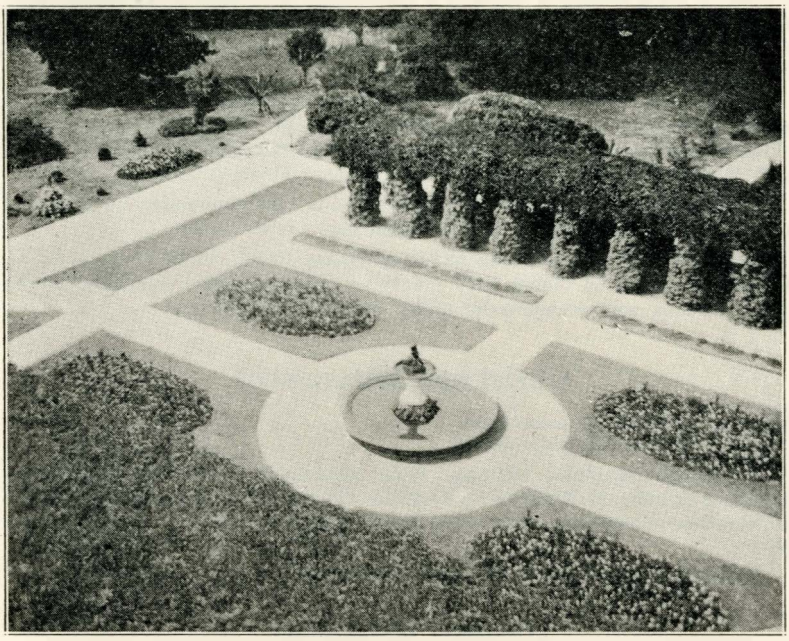

Fig. 10.—ANOTHER VIEW OF THE RUSSIAN PERGOLA
The pergola came out in semicircular form from the palace, forming a cool, shady walk in the heat of the day. —Photograph by N. E. Hansen, in southern Russia, 1894

trellis about 12 feet high. They have long since outgrown this, and are now covering the roof of the garage with a great profusion of blossoms from July until late September.

I have given many shoots of this plant to others, but only one has been successful in getting blossoms. I find that when planted in the bright sunlight, it gives the best results. It also particularly likes to climb on wood.

I have never protected these plants in the winter time, as they seem to thrive without any covering. They are late in starting, and it is sometimes the first part of June before they show any signs of life." Eugene Saenger, Sioux Falls, in letter December 16, 1929. These vines bore a good crop of seed in the dry, hot summer of 1931.

Trumpetcreeper

Bignonia radicans.
Bignonia radicans, Linnaeus. Campsis radicans Seem. Tecoma radicans, Juss.

A tall climbing vine native from Pennsylvania and Illinois to Florida and Texas. Flowers are yellow-red, lighter inside; tubular 2 to 3 inches long. Varieties are found with deep scarlet, orange-red and yellow flowers. This is not hardy north. If tested in the southern part of the state, it would be well to try growing it without a trellis and let it pile up on the ground. In the state rose garden at Sioux Falls, some climbing roses, usually not hardy when grown on a trellis, have bloomed freely when permitted to pile up on the ground, without a trellis.

In the Hybrid Trumpetcreeper (**Campsis hybrida**, Schneid), a garden hybrid (**Campsis radicana x Campsis chinensis**) "the flowers are almost as large and showy as those of **Campsis chinensis** and the plant is hardier." Alfred Rehder, in Bailey's Cyclopedia of Horticulture (2).

Not tested at this station, but mentioned in this connection as probably worthy of a limited trial in the southern part of the state.

Bignonia radicans.—Found hardy at Sioux Falls, South Dakota, by G. B. Tuthill (1931) to bloom very freely on the south and east side of the house; blooms only occasionally under open field conditions.

Christmas Bittersweet

Celastrus orbiculatus punctatus.
Celastrus orbiculatus punctatus, Rehder.

"**Celastrus punctata,** Thunbg. Now referred to **Celastrus orbiculatus punctata,** Rehder, in Bailey's Cyclopedia. Of the same degree of hardiness as **Celastrus orbiculatus,** and much like it in other respects." N. E. Hansen (9).

A climbing vine; native of China and Japan.

Oriental Bittersweet

Celastrus orbiculatus.
Celastrus orbiculatus, Thunb. Celastrus articulatus, Thunb.

"Native of China and Japan. A climbing vine with large glossy leaves. Kills to the ground every winter but sprouts strongly from the root." N. E. Hansen (9).

American Bittersweet

Wax-work

Celastrus scandens.
Celastrus scandens, Linn.

The highly ornamental fruit of the American Bittersweet makes it very popular. At the rate with which the vines throughout the state are stripped of their fruit it will not be long before the vines are all destroyed. It is beginning to be the case in the East wherever free cutting is permitted. The only thing to do it to begin their cultivation before the vines are all gone.

"A twining shrub with orange-yellow pods which burst in autumn and

expose the crimson, fleshy seeds. Abundant throughout the state and thriving under cultivation." Thomas A. Williams (28).

"Common in woods and thickets throughout the state." D. A. Saunders (26).

"Celastrus scandens, Linn. Waxwork, False Bittersweet. Native of Canada to South Dakota and New Mexico. This is found in the woods near Brookings and in other parts of the state, and is a choice climbing vine, with glossy leaves. The orange yellow fruit with crimson seeds hangs on all winter and is prized for holiday decorations. The flowers are small and greenish yellow, polygamous, i. e., partly perfect and partly of one sex on

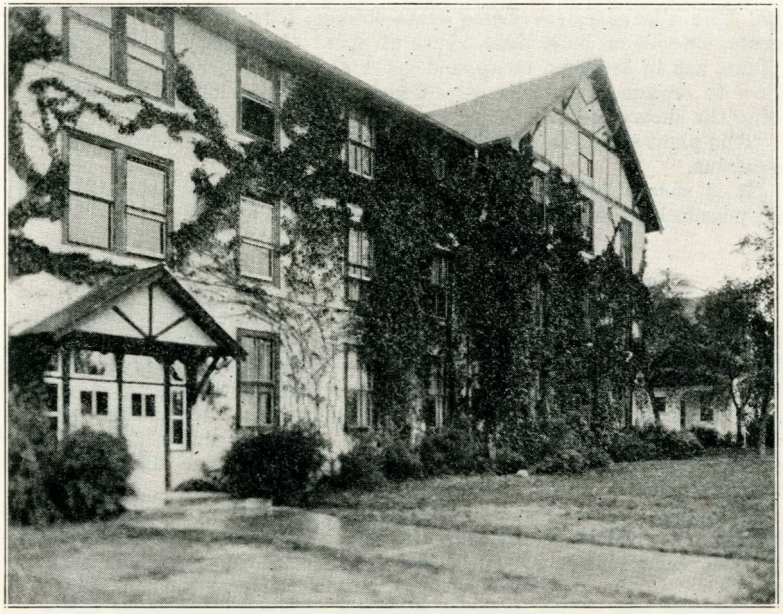

Fig. 11.—AMELOPSIS ENGELMANNI—ENGELMANN CREEPER
Clinging without support on the east wall of one of the South Dakota State College dormitories at Brookings

the same individual, so that every plant produces some fruit. However, some trouble has been reported from single vines not fruiting satisfactorily, and it appears that the best results are obtained by planting several vines together." N. E. Hansen (9).

In England the Bittersweet is called Staff-tree. "Introduced by Peter Collinson in 1736, this climber has never become widely cultivated. Apparently it does not fruit with the freedom that renders it one of the most beautiful autumnal plants of the eastern United States, where it is a native. Most, if not all, plants are unisexual, so that one of each sex should be planted together to form one tangle. Visitors to Niagara Falls will recall the grace and beauty of this climber on Goat Island, where it is very

abundant, and, along with **Citis bicolor,** gives an effect of almost tropical luxuriance." W. J. Bean (5).

"Bittersweet is often hard to get in the fall and it can be kept year after year if given proper care. When you take it down in the spring, wrap it in paper and put in a cool place for the summer. Then in the fall take it out again and put it in a pan of steaming water, nearly boiling, and leave for about '15 minutes. Take it out of the water, shake it and absorb the extra moisture on a dry cloth. The berries will be as plump and bright as the year before." E. H. B., South Dakota. "Womans World," November 19, 1927.

Waxwork: Bittersweet

Celastrus scandens in Manitoba.—"A woody climber 10 to 15 feet high. The alternate leaves are ovate-oblong 2 to 4 inches long, finely serrate, smooth on both sides, acute at apex. Greenish flowers appearing in June, are in terminal compound recemes, 2 to 4 inches in length. The yellow to orange capsules, one-half inch in diameter open in Autumn exposing the showy red aril.

"This plant which favors rich soil, may be found along our streams and mountains.

"It is susceptible to improvement as an ornamental but will hardly have possibilities as a commercial fruit." W. R. Leslie (17).

Clematis

The genus Clematis comprises about 150 species widely distributed, but most abundant in the temperate regions. About 20 species are native of North America and about 80 species in east Asia. They are mostly climbing vines. The garden varieties are prized for the very showy flowers; in most species the flowers are followed by attractive feathery-tailed fruits. Clematis is the Greek name of a climbing plant. According to Rehder, there are about 230 species "widely distributed throughout the temperate regions chiefly of the northern Hemisphere."

"Clematis. We have made no test of the many choice varieties of this climbing vine; caution is advised. The native **Clematis virginiana** has done very well at Brookings. **Clematis jackmani,** with large purple flowers, has been grown in the southern part of the state with winter protection and is considered one of the choicest varieties. **Clematis flammula,** Linn., is reported hardy at Yankton and Mitchell." N. E. Hansen (9).

Clematis douglasii, Hook, var., **Scottii,** Coulter

A variety of **Clematis douglasii,** Hook, which is native in the mountains from Montana to Mexico.

"**Clematis scottii,** Porter. Scott's Clematis. In the Black Hills," D. A. Saunders (26).

Jackman Clematis

Clematis jackmani.
Clematis jackmani. T. Moors.

The Jackmani group comprise a large number of fine garden varieties, produced by hybridizing several species. In 1860 the Jackman Clematis was raised in a nursery by Messrs. Jackman at Working, England. The

seed was produced by crossing **Clematis hendersonii** and **Clematis lanuginosa. Clematis hendersonii** is a hybrid of **Clematis viticella** and **integrifolia. Clematis integrifolia** is native of Europe and Asia. **Clematis viticella** is native of south Europe. **Clematis lanuginosa** was brought from Ningpo, China, to England in 1850. **Clematis jackmani** has flowers 5 inches in diameter with four sepals of rich velvety violet purple. Some of the later varieties of the Jackmani group have flowers 8 inches across, some nearly 12 inches across. There are fine specimens of Jackman Clematis grown on trellises at Sioux Falls and other parts of the state, but careful winter protection is needed to get flowers.

Western Virgins-Bower

Clematis ligusticifolia.
Clematis ligusticifolia, Nutt.

A climbing vine allied to **Clematis virginiana,** but having 5 to 7 leaflets; flowers white, fragrant, three-quarters inch across. Native from Missouri to New Mexico and British Columbia.

"In thickets along streams from the Missouri westward." D. A. Saunders (26).

Sweet Autumn Clematis

Clematis paniculata.
Clematis paniculata, Thunb.

A vigorous climber, native of Japan. Found hardy at Sioux Falls. "White fragrant flowers produced in greatest profusion in late summer." G. B. Tuthill, Sioux Falls, 1931.

Virgins-Bower

Clematis virginiana.
Clematis virginiana, Linn.

A climbing vine with leaves nearly always divided into three (rarely five) leaflets; flowers white in leafy panicles, often monoecious or dioecious, about 1 inch across. The seeds have long silky feathered styles, forming silvery heads. Native from Nova Scotia to Georgia, west to Kansas and South Dakota. One of the best hardy climbers for porches and arbors. In planting this vine care should be taken to plant the northern form, especially as found native in South Dakota. Seed from La Crosse, southwestern Wisconsin, has produced hardy vines in Brookings.

"Along streams and lakes in the Sioux, James and Minnesota valleys." D. A. Saunders (26).

Rose Daphne

Garland Flower

Daphne Cneorum.
Daphne Cneorum, Linn.

A trailing woody vine native of the mountains of Central Europe.

"Here is a gem for the rockery or border planting. Fragrant pink flowers almost completely cover the plant in the early spring, blooming freely again in the fall. It keeps its leaves all winter and comes through perfect-

ly if given adequate winter protection." G. B. Tuthill, Sioux Falls, S. D., 1931.

Bigleaf Wahoo

Evergreen Bittersweet

Euonymus radicans vegetus.

Euonymus radicans, Sieb. var. vegeta, Rehder. E. japonica var. radicans, Regel. E. repens, Hort.

Native of North and Central Japan.

"The best hardy evergreen vine for this climate. Rapid growing when once established, thick glossy dark green leaves, bright orange scarlet berries produced in abundance and remaining on the plant all winter. Clings to brick, stone or concrete. It has proved entirely hardy at the "Wahoo Lodge Gardens" and in Sioux Falls where there are a number of well established plants flourishing lustily in all sorts of exposure." G. B. Tuthill, Sioux Falls, S. D., 1931.

Baby Wintercreeper

Euonymus Kewensis.

Horticultural variety of Euonymus radicans.

"A low dense growing creeper especially valuable for shady spots and the rock garden." G. B. Tuthill, Sioux Falls, S. D., 1931.

Limber Honeysuckle

Lonicera dioica.

Lonicera dioica, Linn. Lonicera glauca, Hill. Lonicera media, Murr. Lonicera parviflora, Lamm.

A twining vine, 3 to 10 feet, or frequently a straggling shrub with long slender branches; flowers greenish yellow or more frequently dull maroon with a yellowish tube; red berries. Native from Quebec to Saskatchewan, south to North Carolina, Ohio and Missouri.

Noted as **Lonicera glauca** at Big Bonanza Springs, west slope shore Big Stone lake gully, by L. H. Pammel, 1917.

According to Rosendahl & Butters in "Trees and Shrubs of Minnesota" **Lonicera dioica** is rare in eastern and southern Minnesota. **Lonicera dioica** var. **glaucescens** (Rydberg) has been described as a distinct species **(Lonicera glaucescens,** Rydberg), and is much more abundant than the typical **Lonicera dioica** with which it integrates completely; it is found in rocky woods, copses and bluffs throughout the wooded part of Minnesota.

"Lonicera glaucescens, Ryberg. Douglas' Honeysuckle. Common in woods and ravines in the Minnesota valley, in the Sioux valley near Sioux Falls and in the Black Hills." D. A. Saunders (26).

Yellownet Japanese Honeysuckle

Lonicera japonica aureoreticulata.

Lonicera japonica, Thunb. var. aureo-reticulata, Nichols. L. flexuosa var. aureo-reticulata, Dipp. L. reticulata aurea, Hort. L. brachypoda reticulata, Witte.

A form of the Japanese Honeysuckle valued for its handsomely netted yellow leaves and creamy white fragrant leaves. Also used as a ground cover (22).

Reported hardy at Sioux Falls by G. B. Tuthill, 1931.

Hall Japanese Honeysuckle

Lonicera japonica halliana.
L. japonica Halliana, var. Halliana, Nichols. L. flexuosa Halliana, Dipp. Caprifolium Hallianum, Hort. L. Halliana, Hort.

A climbing vine, native of China and Japan. Found to be a good trailing vine, but not so hardy on open trellis at Sioux Falls, S. D.

"Yellow and white flowers from early summer till frost, delightfully fragrant. Splendid cover for banks and slopes, foliage almost evergreen." G. B. Tuthill, Sioux Falls, S. D., 1931.

Trumpet Honeysuckle

Lonicera sempervirens.
Lonicera sempervirens, Linnaeus. Caprifolium sempervirens, Michaux.

Native from Connecticut to Florida, west to Nebraska and Texas. A beautiful high-climbing vine with scarlet trumpet-shaped flowers and red berries. In blossom all summer. N. H. Hansen (9).

The leaves are evergreen in the South. At this station, with no trellis this makes a dense mass of vines, with foliage green until November. In favorable seasons, in bloom until heavy frosts.

Common Moonseed

Menispermum canadense.
Menispermum canadense, Linnaeus.

A slender vine climbing 12 feet or more; woody at the base. Native from Quebec to Manitoba, south to Georgia and Arkansas. A handsome climber especially in autumn with the bunches of bluish black fruits resembling small grapes.

"A very pretty half-woody climber with greenish bark, large, angled leaves and clusters of black grape-like fruits which are covered with a delicate bloom. It does well under cultivation and is also valuable for its long, slender, yellowish rhizomes which are used in medicine under the name of "Yellow Parilla." It is given chiefly as a tonic and alterative. Missouri river and east." Thomas A. Williams (28).

"In woods and thickets along streams from the Missouri eastward." D. A. Saunders (26).

Asiatic Moonseed

Menispermum dauricum.
Menispermum dauricum, DC.

A slender vine climbing 12 feet or more, similar to the common moonseed but with smaller leaves and fruiting clusters; spreads by suckers.

"Native of the Amur and Ussuri river regions in eastern Siberia, Manchuria and north China. As received from St. Petersburg this is a very hardy, neat little climbing vine, with smaller, deeper green leaves than the native Moonseed (Menispermum canadensis, Linnaeus)." N. E. Hansen (9).

Japanese Pachysandra

Japanese Spurge

Pachysandra terminalis.

Pachysandra terminalis Sieb. and Succ.

A native of Japan. A trailing vine with thick glossy foliage forming a dense mat.

"About the only perennial evergreen ground cover that is hardy in this section. Does best in shade therefore valuable to underplant among evergreens and shrubs or in the shady corners about the house." G. B. Tuthill, Sioux Falls, S. D., 1931.

Kudzu-bean

Kudzu Vine

Pueraria thunbergiana.

Pueraria thunbergiana, Benth. P. Thunbergiana, Benth. Dolichos japonicus, Hort. Pachyrhizus Thunbergianus, Sieb. & Zucc.

A perennial vine with large tuberous starchy roots and purple flowers. Native of Japan and China. Winter-killed at Sioux Falls, S. D.

Poison Ivy

Rhus toxicodendron, Linnaeus.

Toxicodendron vulgare, Mill.

"Poison Oak, Poison Ivy (**Rhus toxicodendron,** L.) In moist prairies and thickets it grows as a low, upright shrub, while in woods and rocky places it is a climber. It may be readily known by its trifoliate leaves and shiny, white, clustered, berry-like fruits. On many people this plant causes a disagreeable eruption of the skin. Common throughout the state." Thomas A. Williams (28).

Native from Nova Scotia west to British Columbia, south to Arkansas, Utah, and Florida. This plant should be exterminated wherever it is possible to do so. The shining leaves distinguish it from the Virginia Creeper and Engelmann Creeper with five leaflets.

"The plant is very poisonous to the touch and causes serious inflamation of the skin. The irritation is caused by an oleo-resin found in all parts of the plant and secreted by the leaves and bark. While some persons are much less sensitive to the poison than others, no one should handle the plants carelessly because of assumed immunity.

"**Rhus toxicodendron** var. **radicans** (L) Torr. Distinguished from the preceding by the climbing habit, sometimes ascending high into trees by means of roots, which attach themselves to the bark. The stem sometimes attains a diameter of 3-6 cm. (Radicans, rooting).

"In woods, thickets, and along roadsides in the southeastern part of the state." "Trees and Shrubs of Minnesota," Rosendahl and Butters (23).

"**Rhus toxicodendron** L. Poison Ivy. The leaves and stems are poisonous to many people. The form of dermatitis produced, and the seriousness of the case varies according to the susceptibility of the individual. The plant is widely distributed in the state." L. H. Pammel, Manual of Poisonous Plants (20).

"A preventive of poison ivy poison recommended by Dr. James B. Mc-

Nair of the Field Museum of Natural History, Chicago, is a five per cent solution of ferric chloride in water, or in a mixture of water, alcohol and glycerin. This is to be washed on all exposed skin surfaces before going into the woods and allowed to dry without wiping. The thin deposit of iron salt neutralizes the ivy poison immediately upon contact. This remedy has been in use by the botany classes of the University of Chicago for several years with very good results.

"For persons who have had the ill luck to become poisoned, Dr. James F. Couch of the United States Department of Agriculture recommends a wash of a three per cent solution of potassium permanganate. This oxidizes the poison and healing follows rapidly. This remedy leaves the skin brown, but the stain may be removed with a one per cent solution of oxalic acid. Any of these remedies can be mixed by any druggist without a prescription." "Horticulture", December 15, 1929 (published by The Massachusetts Horticultural Society, Boston, in conjunction with The Horticultural Society of New York and The Pennsylvania Horticultural Society).

"The poison ivy, or three-leaved ivy, is sometimes given the confusing name of poison oak. It is common, especially in moist woodlands and fence rows, and is so dangerous a plant that every school child should learn to recognize it. This is easily done by noting the characters of leaf and fruit. The leaflets are always in threes, with the end leaflet slightly stalked, as shown in the figure. In size and toothing they have a general resemblance to the common woodbine or five-leafed ivy. The number of leaflets is, however, a sure distinction. The poison ivy is distinguishable from other three-leafed woodland plants by its woody stem and climbing habit. Its dry, greenish-white berries, the size of small peas, standing in grape-like clusters, are also a conspicuous character of the older plants. In the matter of climbing, however, the plant may vary so widely as to puzzle botanists. It may stand as a low, upright shrub if it has nothing to cling to, but usually it develops as a low vine, climbing by rooting stems over old stumps and walls. If well started at the base of a living tree it may, however, climb to indefinite height, rooting itself in the bark and injuring the tree as well as menacing human passers-by. Some persons are seriously poisoned by the slightest contact with this shrub, while others handle it with immunity. Even the latter may well shun it, however, since if once poisoned they will thereafter remain susceptible. The poison resides in a resinous exudate on the surface of the plant, and, according to our best authorities, it is transmitted only by contact, i. e. not blown through the air. In many cases especially susceptible persons are probably unwittingly poisoned by getting it on their shoes or clothing and, later, poisoning their hands by contact with these. Most persons are especially liable to the poison when perspiring freely. After wandering in proximity to the plant at such a time, it is a wise precaution thoroughly to wash hands and face with free use of strong soap or, much better, with washing hands and face with free use of strong soap or, much better, with baking soda or some other strongly alkaline solution, which will remove the poison before it has time to strike in. If too late for this, the best remedy is to bathe the parts freely with some of these alkaline washes. A solution of sugar of lead in alcohol is one of the best. Where the poison-ivy occurs near schools or dwellings, it should be exterminated. If in the open field this is easily done by digging it out. Often, however, it grows in stone walls among stumps, or so close to the base of a tree that it is difficult to

get at the roots. In such cases a liberal application of a strong solution of washing soda will destroy it. A solution of arsenate of soda (1 pound in 8 gallons of water) is even more effective." "Vermont Agricultural Experiment Station Bulletin" No. 145. 1909.

Gasoline freely applied and allowed to dry on the affected parts, is recommended lately as a remedy for poison ivy.

Bristly Greenbrier

Smilax hispida.
Smilax hispida, Muhl.

Smilax hispida, Bambo Brier, is native from Connecticut to Minnesota, south to North Carolina and Texas.

"This is the only one of the northern species that does not spread rapidly by rootstocks; by proper attention to pruning this species will make an upright hedge-plant of merit." J. B. Norton (2).

"Green-Briar (**Smilax hispida,** Muhl.) Somewhat like the preceding (**Smilax dotundifolia**) but with the leaves less rounded and the stem (at least below) densely covered with slender, blackish prickles. More or less plentiful throughout the more wooded localities in the eastern half of the state." Thomas A. Williams (28).

"**Smilax hispida,** Muhl. Hispid Greenbrier. In the southern part of the Sioux valley from Sioux Falls southward and in the Southern Missouri valley to Running Water." D. A. Saunders (26).

Smilax rotundifolia, Linnaeus.—This species is not listed in Standardized Plant Names.

The Horse-Brier is native from Nova Scotia to Illinois, south to Georgia and Texas. "A rank weedy vine with nothing to recommend it for general planting as it spreads rapidly by underground rhizomes." J. B. Norton (2).

"Common Green-Brier (**Smilax rotundifolia,** L.). A climbing plant with the stem armed with scattered prickles and with large rounded leaves; the bluish-black berries covered with a distinct bloom. Specimens of this plant were collected at Running Water and though it has not yet been found elsewhere it probably occurs throughout the southeastern part of the state. This climber grows naturally in the denser, moister thickets and like the following species (**Smilax hispida**) may be used as an ornamental with good effect." Thomas A. Williams (28).

The Carrion Flower (**Smilax herbacea,** Linn.), a herbaceous species growing in woods and thickets throughout the state, is undesirable on account of the strong carrion odor of the flowers. There is an allied herbaceous species (**Smilax lasioneuron,** Hook.; **Smilax herbacea** var. **inodora,** Hort.) with no carrion odor, found from Colorado to Manitoba, in the Great Plains and eastern Rockey mountains.

Amur Grape

Vitis amurensis.
Vitis amurensis, Ruprecht. Vitis vulpina var. amurensis, Regel.

"Native of Amurland, Korea, and north China. Worth growing for its vigorous habit, and for the usually fine crimson and purple autumn hues of its noble foliage." W. J. Bean (5).

"**Vitis amurensis,** Rupr. Amur Grape. Native in northeastern Asia, including Mongolia, Manchuria and north China. Small plants of this wild

grape planted in the spring of 1898 have proved hardy without winter protection." N. E. Hansen (9).

"Sungari Grape. Introduced 1926. This is Vitis amurensis Rupr., a wild grape found in great profusion in the mountains, beginning a few miles east of Harbin, north China, on the Siberian railway and extending east to the Pacific ocean. The wild-flavored berries are somewhat larger than our wild grapes. Some of the berries are five-eighths inch in diameter; color, purple black. In autumn the foliage becomes very ornamental with purple and red tints, so that this grape should be well adapted for arbors. These plants are one-year seedlings grown from seed collected by N. E. Hansen, a few miles east of Harbin, north China, in 1924. Harbin is located on the Sungari river, the chief river of this region." N. E. Hansen (11).

Fox Grape

Vitis labrusca.

Vitis labrusca, Linnaeus.

"**Vitis Labrusca,** Linn. Fox Grape. Native of the eastern United States, from New England southwards in the Alleghany region and highlands to west central Georgia. The parent of most of the cultivated American grapes. Sometimes used for arbors, but none of the many sorts tested at this station, including Concord and its seedlings and hybrids, with the Old World wine grape (**Vitis vinifera,** Linn.), have proved hardy even when laid down in autumn and covered with earth for winter protection. Some grapes are raised in the southern part of the state. For the northern part, plant the native wild grape for the present." N. E. Hansen (9).

The Fox Grape and the hybrid of Fox Grape and European grape (**Vitis vinifera**) have been hybridized at the South Dakota station by the writer. Of the resulting new seedlings, 32 were named and introduced in the spring of 1925. These are described in South Dakota Bulletin 224.

Riverbank Grape

Vitis vulpina.

Vitis vulpina, Linnaeus. Vitis riparia, Michaux. Vitis odoratissima, Donn. Vitis cordifolia var. riparia, Gray.

In European literature **Vitis riparia** is the preferred name. "Riparia" is Latin for river bank.

"Early wild grape (**Vitis vulpina,** L.) . This is the common native grape and is found all over the state. The fruit is widely used for making pies, jellies, etc." Thomas A. Williams (28).

"**Vitis vulpina,** Linn. (**Vitis riparia,** Mchx.). Native from New Brunswick to Manitoba, Kansas and Colorado, south to West Virginia, Missouri and Texas. None of the cultivated varieties or hybrids of this species, so far as tested at this station, has proved hardy, the parent being of the eastern and southern forms. Thousands of seedlings are being raised at this station of the northwestern form, as found in the Dakotas and Manitoba, Minnesota and northwest Iowa; this spring 5,000 plants were set in vineyard for fruiting, the hope being to improve the fruit in size and quality. For ornamental purposes the wild grape has decided value. Arbors can be quickly covered with a few vines. If fruit is desired, either

bearing vines should be taken, or plants grown from cuttings or layers taken from a bearing vine. This is because bearing vines have perfect flowers, containing both stamens and pistils, while all the other vines bear staminate or male blossoms only. But even if the young vines dug at random turn out to be staminate vines they will be desirable, the blossoms being very fragrant." N. E. Hansen (9).

In later years many hybrids of this native species have been produced by the writer. See South Dakota Bulletin 224 for names and descriptions of the 32 varieties introduced in the spring of 1925.

Chinese Wisteria

Wisteria sinensis.

Wisteria sinensis, Sweet. Wisteria chinensis, De Candolle. Glycine sinensis, Sims. Wisteria consequana, Loud. Kraunhia sinensis, Makino.

"**Wisteria chinensis,** DC. Chinese Wisteria. Referred to **Wisteria polystachya,** K. Koch, by Dippel and Koehne. Native of China and Mongolia. This favorite climbing vine is reported half-hardy at Mitchell and Yankton. Not usually considered very hardy." N. E. Hansen (9).

The Chinese Wisteria, according to W. J. Bean, is native of north China and first introduced into England in 1816, from a garden in Canton. In England it is "a strong-growing climber, capable of covering lofty trees. * * * Some of the older plants in this country are over 5 feet in circumference." W. J. Bean, in "Trees and Shrubs Hardy in the British Isles" (5). Canton is in southern China. According to Dippel this species is native of China and Mongolia and cultivated in Japan. It would be of interest to re-import this from Mongolia. It might give us a really hardy wisteria. This would be very desirable for arbors, as wall plants on houses, and on pergolas.

There are seven species of Wisteria in North America and eastern Asia. The Wisteria in various species and varieties is one of the glories of Japanese gardens.

Wisteria is a member of the Legume family. The flowers are lilac colored, pea-flower shaped, in pendent racemes, 8 to 12 inches long.

"The genus was named for Casper Wistar, professor of anatomy in the University of Pennsylvania, 1761–1818, but spelled Wisteria by Nuttall, author of the genus, the spelling Wistaria being a later adaptation." Bailey (2).

A pruned hedge of the Siberian Pea-Tree (Caragana arborescens), at Brookings. This hedge is trimmed in June of each year and is allowed to keep two or three inches of growth each year. When severe pruning is necessary to avoid large size, the heading-back should be done when the plants are dormant during early winter. For a hedge of large size it is not necessary to prune back usually. One severe pruning in the early years will cause several shoots to grow from the bottom, and this bush form will be retained without further pruning.