Annual report of the Wisconsin State Horticultural Society for the year ending July 1, 1921. Vol. LI 1921

Wisconsin State Horticultural Society
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ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year Ending July 1, 1921

VOL LI

Frederic Cranefield, Editor
Madison, Wis.

MADISON, WISCONSIN
HOMESTEAD PRINTING COMPANY
1921

LETTER OF TRANSMITTAL

Madison, Wis., July 1, 1921.

To His Excellency, John J. Blaine,
Governor of Wisconsin.

Dear Sir:—I have the honor to transmit to you herewith the Fifty-First Annual Report of the Wisconsin State Horticultural Society.

Respectfully,
Frederic Cranefield,
Secretary.

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OFFICERS AND COMMITTEES FOR 1921

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J. A. HAYS, President ..... Gays Mills
H. C. CHRISTENSEN, Vice-President ..... Oshkosh
F. CRANEFIELD, Secretary-Treasurer ..... Madison

EXECUTIVE COMMITTEE

J. A. Hays ..... Ex-Officio
H. C. Christensen ..... Ex-Officio
F. Cranefield ..... Ex-Officio
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2nd Dist., R. J. Coe ..... Ft. Atkinson
3rd Dist., E. J. Frautschi ..... Madison
4th Dist., A. Leidiger ..... Milwaukee
5th Dist., James Livingstone ..... Milwaukee
6th Dist., J. W. Roe ..... Oshkosh
7th Dist., C. A. Hofmann ..... Baraboo
8th Dist., J. E. Leverich ..... Sparta
9th Dist., L. E. Birmingham ..... Sturgeon Bay
10th Dist., Paul E. Grant ..... Menomonie
11th Dist., Irving Smith ..... Ashland

BOARD OF MANAGERS

J. A. Hays F. Cranefield

H. C. Christensen

FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN

The behavior of varieties of fruits is influenced very largely by their environment. The conditions of soil, exposure and latitude over such an extensive area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. Hardiness of plant and fruit bud has been the leading thought in the selection of varieties.

APPLES, HARDIEST VARIETIES

Usually Hardy in Any Part of Wisconsin.

Duchess, Hibernal, Livland Raspberry, Longfield, Lubsk Queen, Malinda, Patten Greening, Whitney.

APPLES, GENERALLY HARDY

Astrachan (Red), Autumn Strawberry, Delicious, Dudley, Fall Orange, Fameuse (Snow), Golden Russett, Livland Raspberry, Longfield, Lubsk Queen, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Duchess, Patten Greening, Saint Lawrence, Salome, Scott, Tolman (Sweet), University, Utter, Wealthy, Westfield (Seek-no-Further), Windsor, Wolf River.

APPLES

Varieties hardy in special localities.

Ben Davis, Fallawater, Gano, Hubbardston, Jonathan, King, Northern Spy, Pewaukee, Sutton Beauty, Willow Twig, York Imperial, Bellflower.

APPLES (Commercial Orchard List).

It is generally conceded that a commercial orchard should consist of but few varieties; the following are suggested: **Duchess, Dudley, Fameuse, McMahan, McIntosh, Northwestern Greening, Tolman, Wealthy, Windsor, Wolf River.**

APPLES (Six Varieties for Farm Orchard).

Duchess, Livland Raspberry, Northwestern Greening, Talman (Sweet), Wealthy, Windsor.

CRABS.

Hyslop, Sweet Russett, Virginia, Whitney.

PLUMS.

Of the classes commonly cultivated, viz.: **European, Japanese, Native or American and Hansen Hybirds,** the two last named are most likely to succeed.

NATIVE PLUMS.

De Soto, Hammer, Hawkeye, Forest Garden, Surprise.

HANSEN HYBIRDS.

Hanska, Opata, Sapa.

EUROPEAN PLUMS.

(Not recommended for general cultivation.) **Damson, Green Gage, Lombard, Moore's Arctic.**

JAPAN PLUMS.

(Not recommended for general cultivation.) **Burbank.**

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Brighton (Red), **Concord** (Black), **Delaware** (Red), **Diamond** (Green), **Moore's Early** (Black), **Niagara** (Green), **Winchell (Green Mountain** (Green), **Worden** (Black).

BLACKBERRIES.

Eldorado, Snyder.

STRAWBERRIES.

Varieties starred have imperfect flowers and must not be planted alone.

Aroma, Bubach, Dr. Burrill, Dunlap, Gandy, Glen Mary, *Haverland, *Sample, Splendid *Warfield.

FALL BEARING STRAWBERRIES.

Progressive, Superb.

TWO VARIETIES STRAWBERRIES FOR FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: **Conrath, Cumberland, Gregg, Plum Farmer.**
Red: **Cuthbert, Marlboro, King.**
Purple: **Columbian.**

CURRANTS.

Red: **Red Cross, Perfection, Pomona, Wilder.**
White: **White Grape.**
Black: **Lee's Prolific, Naples.**

GOOSEBERRIES.

Downing.

WARNING. Currant and Gooseberry bushes should not be planted or permitted to remain within 600 yards of white pine, especially in the northwestern counties. They spread the blister rust, a disease which kills young white pine trees. This applies to ornamental flowering currants also.—State Department of Agriculture.

PEARS.

On account of the prevalence of blight and winterkilling, pears are not generally recommended for Wisconsin. Good crops are occasionally produced under favorable conditions, especially in the southeastern part of the state. The following list includes both early and late varieties:

Anjou, Bartlett, Clairgeau, Clapp Favorite, Early Bergamot, Flemish Beauty, Idaho, Kieffer, Lawrence, Louise, Seckel, Sheldon, Vermont Beauty.

TREES AND SHRUBS RECOMMENDED

LARGE DECIDUOUS TREES

Silver Maple	Acer dasycarpum
Wiers Cut Leaf Maple	Acer dasycarpum var.
Norway Maple	Acer Platanoides
Scarlet Maple	Acer rubrum
Sugar Maple	Acer saccharinum
Paper Birch	Betula papyrifera
Red Birch	Betula nigra
Hackberry	Celtis occidentalis
White Ash	Fraxinus americana
Green Ash	Fraxinus viridus
Maidenhair Tree	Ginko biloba
Honey Locust	Gleditschea triacanthos
Kentucky Coffee Tree	Gymnocladus canadensis
Black Walnut	Juglans nigra
European Larch	Larix europaea
American Larch	Larix laricina
Bolles Poplar	Populus Bolleana
Carolina Poplar	Populus monilifera
Black Cherry	Prunus serotina
White Oak	Quercus alba
Scarlet Oak	Quercus coccinea
Bur Oak	Quercus macrocarpa
Pin Oak	Quercus palustris
Red Oak	Quercus rubra
Golden Willow	Salix vittellina
Wisconsin Weeping Willow	Salix babylonica var.
Laurel Willow	Salix pentandra
Basswood	Tilia americana
American Elm	Ulmus americana

FOR STREET PLANTING

American Elm	Basswood
Norway Maple	Pin Oak

SMALL DECIDUOUS TREES

(This class includes small deciduous trees of more value for ornament than for shade or protection.)

Tartarian Maple	Acer tartaricum

Juneberry	Amelanchier canadensis
Hawthorn	Crataegus Crus-galli
Buckeye	Aesculus glabra
Russian Mulberry	Morus alba var. tartarica
Ironwood	Ostrya virginiana
Mountain Ash (native)	Pyrus americana
Bechtel's double fl. Crab	Pyrus var. Bechtelii
Western Crab Apple (native)	Pyrus ioensis

LARGE EVERGREENS

(None of the "large" evergreens should be planted on small lawns on account of their great size at maturity and dense habit of growth. A spruce or a pine may reach a height of 50 to 100 feet with a spread of 50 feet; so also may an elm but the lower branches of the elm may advantageously be removed while such pruning of an evergreen would destroy its beauty.)

Concolor Fir	Abies concolor
White Spruce	Picea canadensis
Norway Spruce	Picea excelsa
Colorado Blue Spruce	Picea pungens
Austrian Pine	Pinus austriaca
Red Pine	Pinus resinosa
Bull Pine	Pinus ponderosa
White Pine	Pinus strobus
Scotch Pine	Pinus sylvestris
Douglas Fir	Pseudotsuga taxifolia
Arbor Vitae (White Cedar)	Thuja occidentalis
Hemlock Spruce	Tsuga canadensis

SMALL EVERGREENS

Dwarf Juniper	Juniperus communis var.
Waukegan Juniper	Juniperus horizontalis
Japanese Trailing Juniper	Juniperus procumbens
Sabin Juniper	Juniperus Sabina
Tamarix-leaved Juniper	Juniperus Sabina var.
Mugho Pine	Pinus montana var. mughus
American Yew	Taxus canadensis
Siberian Arbor Vitae	Thuja orientalis var.
Pyramidal Arbor Vitae	Thuja pyramidalis
Globe Arbor Vitae	Thuja compacta

SHRUBS

Mountain Maple	Acer spicatum
Thunberg's Barberry	Berberis Thunbergii
Weigela rosea	Diervilla florida
Weigela	Diervilla floribunda

Winged Burning Bush.....Euonymus alata
Strawberry Tree.....Euonymus europaeus
Silver Berry.....Eleagnus argenta
Forsythia .....Forsythia intermedia
Summer Snowball, Hardy Hydrangea.....Hydrangea arborescens
Garden Hydrangea.....Hydrangea paniculata gr.
Amur Privet.....Ligustrum amurense
Regal's Privet.....Ligustrum Ibota var.
Morrow's Honeysuckle.....Lonicera Morrowii
Ruprecht's Honeysuckle.....Lonicera Ruprechtiana
Tartarian Honeysuckle.....Lonicera tatarica
Mock Orange.....Philadelphus coronarius grandiflora
Mock Orange, large.....Philadelphus inodorus
Lemoine's Philadelphus.....Philadelphus Lemoinei
Russian Almond.....Prunus Nana
Smoke Bush.....Rhus Cotinus
Cutleaf Sumac.....Rhus typhina and glabra var.
Alpine Currant.....Ribes alpinum
Flowering Currant.....Ribes aureum
Rose Acacia.....Robina hispida
Japanese Rose.....Rosa rugosa
Cut leaf Elder.....Sambucus canadensis var. acutiloba
Golden Elder.....Sambucus nigra var. aurea
Buffalo Berry.....Shepherdia argenta
Hybrid Snow Garland.....Spirea arguta
Billard's Spirea.....Spirea Billardii
Bumalda Spirea.....Spirea Bumalda
Callosa Spirea.....Spirea Callosa alba and rubra
Douglas' Spirea.....Spirea Douglassi
Van Houten's Spirea, Bridal Wreath.....Spirea Vanhouttei
Persian Lilac.....Syringa persica
Downy Lilac.....Syringa villosa
Common Lilac.....Syringa vulgaris
Wayfaring Tree.....Viburnum lantana
Snowball.....Viburnum Opulus var. sterilis
Dwarf Cranberry Tree.....Viburnum Opulus nanum

ROSES

Hardy garden—Rosa rugosa, Harrison Yellow, Persian Yellow, Cabbage Rose, Michigan Prairie Rose, Madame Plantier, Conrad F. Meyer.

Hybrid perpetual (require winter protection)—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Marshall P. Wilder, Magna Charta, General Washington, Ulrich Brunner, John Hopper, Capt. Christy, Druschki, Baron Boustettin.

Moss roses—Salet, Henry Martin, Crested Moss.

Climbers—Prairie Queen, Seven Sisters, Gem of the Prairie, Crimson Rambler, Dorothy Perkins, Excelsa, American Pillar.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRUBS

The height at maturity of the different species must be considered when planting in groups or borders. This will depend so much upon their environment that it is difficult to give the height in feet that any species may be expected to attain. When different kinds are planted under like conditions it may be assumed that relative heights will be maintained.

The following may serve as a partial guide in planting:

Tall 8-12 feet, some kinds 15 feet

Weigela	Smoke Bush
Burning Bush	Buffalo Berry
Strawberry Tree	Common Lilac
Ruprecht's Honeysuckle	Snowball
Tartarian Honeysuckle	Wayfaring Tree
Mock Orange	Cut Leaf Elder
Forsythia	Cut Leaf Sumac

Medium 4-8 feet

Japanese Rose	Mountain Maple
Silver Berry	Billard's Spirea
Garden Hydrangea	Douglas' Spirea
Morrow's Honeysuckle	Van Houten's Spirea
Missouri Currant	Persian Lilac

Dwarf 2-4 feet

Alpine Currant	Callosa Spirea
Thunberg's Barberry	Meadow Sweet Spirea
Rose Acacia	Hardy Hydrangea (summer fl.)
Bumalda Spirea	

NATIVE SHRUBS SUITABLE FOR PLANTING ON HOME GROUNDS

Common Name.	Scientific Name.
New Jersey Tea	Ceanothus americanus
Button bush	Cephalanthus occidentalis
Alternate Leaved Dogwood	Cornus alternifolia
Bailey's Dogwood	Cornus Baileyi
Round-leaved Dogwood	Cornus circinata
Grey Dogwood	Cornus paniculata
Red Osier Dogwood	Cornus stolonifera
Hazelnut	Corylus americana and rostrata
Leatherwood (Wickopy)	Dirca palustris

Wahoo	Euonymus atropurpureus
Witch Hazel	Hamamelis virginiana
St. John's Wort	Hypericum pyramidatum
Winterberry (Holly)	Ilex verticillata
Trailing Juniper	Juniperus procumbens
Ninebark	Physocarpos opulifolia
Hop Tree	Ptelea trifoliata
Dwarf Sumac	Rhus copalina
Smooth Sumac	Rhus glabra
Staghorn Sumac	Rhus typhina
Wild Rose (dwarf)	Rosa blanda
Swamp Rose	Rosa carolina
Prairie Rose	Rosa setigera
Wild Rose	Rosa humilis
White-flowered Raspberry	Rubus Nutkanus
Purple-flowered Raspberry	Rubus odoratus
Common Elder	Sambucus canadensis
Scarlet Elder	Sambucus racemosa
Meadow Sweet	Spirea salicifolia
Bladder Nut	Staphylea trifolia
Snowberry	Symphoricarpus racemosus
Coral Berry, Indian Currant	Symphoricarpus vulgaris
Ground Hemlock	Taxus canadensis
Maple leaved Viburnum	Viburnum acerifolium
Sheepberry	Viburnum Lentago
Arrow Wood	Viburnum dentatum
Bush Cranberry	Viburnum americana
Prickly Ash	Zantoxylum americanum

SIX SHRUBS FOR HOME GROUNDS

The following are all reliably hard in any part of the state:

Common Lilac, Tartarian Honeysuckle, Rosa Rugosa, Mock Orange or Syringa, Van Houten's Spirea (Bridal Wreath), Thunberg's Barberry.

HARDY VINES

Virginia Creeper	Ampelopsis quinquefolia var.
Engleman's Ivy	Ampelopsis quinquefolia var. Englemanii
Japanese Clematis	Clematis paniculata
Native Clematis	Clematis virginiana
Trumpet Honeysuckle	Lonicera sempervirens
Wild Grape	Vitis riparia

EIGHT HARDY HERBACEOUS PERENNIALS

Phlox, Peony, Larkspur. Bleeding Heart, Lily of the Valley, Iris, Oriental Poppy, Shasta Daisy.

COMPARATIVE HEIGHT AT MATURITY OF NATIVE SHRUBS

Dwarf 2-4 feet

Winterberry
Trailing Juniper
Prairie Rose
Wild Rose (dwarf)
Snowberry
Hazelnut (rostratum)
Coral Berry
Ground Hemlock
Maple leaved Viburnum
New Jersey Tea
St. John's Wort
Dwarf Cranberry Tree

Medium 4-8 feet

Gray Dogwood
Winterberry
Swamp Rose
White fl. Raspberry
Purple fl. Raspberry
Leatherwood
Wild Rose (tall var.)
Arrow Wood
Hazelnut (americanum)

Tall 8-12, some kinds to 20 feet

Button Bush
Round leaved Dogwood
Red Osier Dogwood
Bailey's Dogwood
Common Elder
Scarlet Elder
Bladder Nut
Wahoo
Ninebark
Staghorn Sumac
Dwarf Sumac
Sheepberry
Bush Cranberry
Prickly Ash
Hop Tree
Witch Hazel

SHRUBS REQUIRING PROTECTION

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED AND FOUND NOT ENTIRELY HARDY WITHOUT PROTECTION

Common Name.	Scientific Name.
Bladder Senna	Colutea arborescens
Japanese Quince	Cydonia Japonica
Slender Deutzia	Deutzia gracilis
Goumi	Eleagnus longipes
Pearl Bush	Exochorda grandiflora
Golden Bell	Forsythia suspensa
Snowdrop tree	Halesia tetraptera
Kerria	Kerria japonica
Common privet	Ligustrum vulgare
Purple leaved Plum	Prunius cerasifera var. (Prunus pissardi Hort.)
Flowering Almond	Prunus japonica
Flowering Plum (double)	Prunus triloba
Tamarix	Tamarix var.
Thunberg's Spirea	Spirea Thunbergil

SHRUBS FOR SHADY PLACES

Alpine Currant
Elders
Ground Hemlock
Hydrangea (arborescens)
Indian Currant
Loniceras
Flowering Currant
Privets
Snowberry
Viburnum (Maple leaved)
Witch Hazel

HARDY PERENNIALS

Scientific Name.	Common Name.
Achillea ptarmica, The Pearl or Boule de Niege	Milfoil
Aquilegia, long spurred Hybrids and many varieties	Columbine
Boltonia, asteroides and latisquama	False Chamomile
Campanula Carpatica	———
Campanula persicaefolia	Peach Bells
Chrysanthemum maximum	Shasta Daisy
Coreopsis lanceolata	Tickseed
Delphinium	Larkspur
Belladonna	
Formosum	
Hybrids	
Dianthus plumarius	Grass Pink
Gaillardia grandiflora	Blanket Flower
Gypsophila paniculata	Baby's Breath
Hemerocallis, several varieties	Day Lily
Iris, scores of varieties	Fleur-de-lis
Mad. Chereau	
Honorabilis	
Silver King	
Queen of May	
pallida dalmatica	
orientalis blue	
Lilium tigrinum	Tiger Lily
Lilium elegans	Garden Lily
Lilium dauricum	Garden Lily
Papaver Orientale	Oriental Poppy

Peony, Many varieties,

Six good ones:

Rubra Superba, late red
Felix Crousse, Midseason red
Festiva Maxima, Early white
Greivaflora rubra
Edulis Superba, Early pink
Officinales rubra plena

Phlox, many varieties.....Phlox

Seven good ones:

Elizabeth Campbell, Light salmon pink
Europea, White, carmine eye
Mrs. Jenkins, White
B. Compte, French purple
R. P. Struthers, Bright rosy red
Beranger, Delicate pink
Miss Lingard, Early white, pink eye

Platycodon grandiflorum.....Balloon Flower
Pyrethrum Uliginosum.....Giant Daisy
Pyrethrum roseum.....Persian Daisy
Rudbeckia purpurea .....Purple Cone Flower
Sedum spectabile .....Stonecrop
Veronica spicata..... .....Speedwell

NATIVE PERENNIALS ADAPTED TO PLANTING IN HOME GROUNDS

Scientific Name.	Common Name.
Aster Novae Anglae	New England Aster
Anemone pennsylvanica	Prairie Anemone
Anemone Pulsatilla	Badger or Pasque Flower
Asclepias tuberosa	Butterfly Weed
Aquilegia canadensis	Columbine
Campanula rotundifolia	Harebell
Caltha palustris	Marsh Marigold
Dodocatheon media	Shooting Star
Eupatorium ageratoides	White Snakeroot
Euphorbia corollata	Flowering Spurge
Helenium autumnale	Sneezewort
Hydrophyllum canadense	Waterleaf
Liatris squarrosa	Blazing Star
Lilium canadense	Native Lily
Lilium Superbum	Turks Cap Lily
Lobelia cardinalis	Cardinal Lobelia
Mertensia Virginica	Lungwort
Phlox divaricata	Woods Phlox
Phlox pilosa	Prairie Phlox
Physostegia virginica	False Dragonhead
Polemonium reptans	Greek Valerian
Rudbeckia hirta	Black-eyed Susan
Tradescantia virginica	Spider Lily
Trilium grandiflorum	White Wake Robin
Veronica virginica	Speedwell
Viola pedata	Birdsfoot Violet

SPRING FLOWERING BULBS

Tulips, Single dwarf early; Duc van Tholl, pink scarlet and white, Tulip medium season; Artus, red, Chrysolora, yellow, Cottage Maid, pink.

Tulips, large flowering, late; Darwin; Gesneriana.

Hyacinth single; Charles Dickens, pink, Baroness von Thuyll, white, Czar Peter, blue.

Narcissus (daffodil), Von Sion, double, Emperor, single, poeticus and ornatus.

Crocus; Mixed.

Tulips and other Holland bulbs for outdoor blooming planted in September or October will bloom early in spring.

BULBS FOR INDOOR CULTURE

Narcissus: Von Sion (double), Emperor, princeps, poeticus, paper white, Chinese sacred lily.

Hyacinths: Any variety.

Bulbs for forcing should be potted in October or November and kept in a dark cellar for several weeks. When well rooted the pots may be brought to the light as desired for a succession of bloom. The paper white and Chinese lily may be grown in water and do not require the "dark" treatment.

CONSTITUTION AND BY-LAWS
OF THE
WISCONSIN STATE HORTICULTURAL SOCIETY

(As amended January 13, 1921.)

With Brief Historical Outline

In November, 1853, a small group of Wisconsin fruit growers met in Whitewater and organized the Wisconsin Fruit Growers' Association. According to the scant records available this association flourished until the beginning of the Civil war.

September 29, 1865, a similar group which had been in attendance at the state fair held in Janesville met and organized the Wisconsin State Horticultural Society. The first officers were: President, B. F. Hopkins; vice presidents, one in each county named; secretary, J. C. Plumb; treasurer, F. C. Curtis; executive committee, Geo. J. Kellogg and L. P. Chandler.

For several years annual meetings were held at the same time and place as the meetings of the Agricultural Society and the proceedings printed in one volume.

In 1871 the society was granted a charter by the legislature and provision made for the publication of the reports of the society in a separate volume. From that time to the present the society has been a ward of the state, receiving state aid in return for which it has rendered a distinct service through the collection and dissemination of information on fruits, flowers and vegetables.

The society during its early years confined its efforts largely to the testing and selection of varieties suitable to our climate, an extremely important and valuable work.

The activities of the society have broadened from decade to decade through its more than half century of existence until it is now recognized as an important factor in the state's progress and as one of the most progressive and active organizations of its kind in the United States.

In 1904 the society departed from the plan followed by practically all horticultural societies of paying the secretary merely a nominal salary for nominal services and provided funds for a full time secretary and a central, permanent office. Probably no other step has exerted greater influence on the society than this.

From 1896 to 1901 the society published a monthly journal, The Wisconsin Horticulturist. The records fail to show why it was discontinued.

From 1906 to 1910 Bulletins were published at irregular intervals, nineteen in all, of quarto size ranging from 8 to 32 pages.

September, 1910, marked the birth of Wisconsin Horticulture, a 16-page monthly journal sent to members and exchanges only. The

membership fees and advertising more than cover the expense of publication, leaving a handsome margin of profit.

Early records show that the society was active in promoting horticultural exhibits at the state fair and it appears that close relations existed between the society and the fair management until the early eighties, when a break occurred. Beginning with the 1904 state fair and to the present the society has again taken an active part in these exhibitions, expending in one year as high as one thousand dollars of its funds for an exhibit of fruit.

Relations with the Horticultural Department of the Agricultural College have been strengthened and the society and the department now work in perfect harmony.

In this brief outline much has necessarily been omitted; no mention has been made of the spirit, the soul, of the organization. A perusal of the reports of the society leaves the impression that the courage and tenacity of purpose of that little group of sturdy pioneers who met in Whitewater in 1853 has been transmitted to their followers and has been our guiding spirit until the present day. As out of the oaken glades, rich bottom lands and rolling clay terranes of our state there has been developed one of the richest agricultural domains in the world, so have the men and women who have had the love of fruit and flowers in their hearts kept pace through a half century and more with the progress of events and have through the medium of the Wisconsin State Horticultural Society built up a splendid horticultural industry in our state.

Frederic Cranefield, Secretary.

Madison, Wis., July 1, 1921.

CONSTITUTION.

Article 1. This Society shall be known as "The Wisconsin State Horticultural Society" and its location shall be at the city of Madison, Dane county, Wisconsin, where its principal office shall be maintained.

Article 2. The object of this Society shall be the advancement of the art and science of horticulture throughout the state.

Article 3. This Society is formed without capital stock.

Article 4. This Society shall consist of life members, annual members, honorary life members, and honorary annual members. The fee for membership shall be fixed by the Executive Committee.

Honorary annual members may, by vote, be elected and invited to participate in the proceedings of the Society. Honorary life members shall be elected by vote of the Society, and shall be distinguished for special merit in horticultural and kindred sciences, or shall confer some particular benefit upon the Society.

Article 5. The general officers of the Society shall be a President, Vice President, Secretary-Treasurer to be known hereinafter as Secretary, and an Executive Committee, consisting of the foregoing officers and eleven additional members, a majority of whom shall constitute a quorum at any of its meetings.

The officers aforesaid, except the Secretary, shall be elected, by ballot, at the annual meeting, and shall hold office for one year thereafter and until their respective successors are elected. The Secretary

shall be appointed by the Executive Committee at its annual meeting after the election of officers and shall hold office for one year thereafter or until his successor is appointed.

Article 6. The principal duties of the general officers shall be as follows:

The President shall preside at all meetings of the Society and of the Executive Committee, shall exercise a general supervision and control of the business and affairs of the Society, and shall sign all leases, deeds and instruments for the transfer, conveyance or assignment of the corporate property, and all contracts, papers and instruments necessary or convenient in the transaction of the business of the Society, and when necessary, acknowledge the same.

The Vice President shall act as President in case of the absence, disability or removal of the President.

The Secretary shall conduct the general correspondence of the Society and keep a record of the business and of the proceedings at all meetings of the Society and of the Executive Committee; he shall keep, safely and systematically, all books, records, papers and documents belonging or pertaining to the Society or the business thereof; he shall countersign all deeds, leases and conveyances, and, when necessary, acknowledge the same.

He shall receive and safely keep all moneys, notes, securities and property of the Society, which may come into his hands and shall pay out or dispose of the same only upon such terms and conditions as the Executive Committee may direct or the by-laws provide. He shall keep a correct account of all moneys received and disbursed and shall render such account of the same as shall be required by the Executive Committee or prescribed in the by-laws. And he shall execute a bond to the Society, in such sum, and with such sureties, as the Executive Committee shall approve, conditioned upon the faithful performance of his duties, and for the payment and delivery to his successor of all the moneys and property of the Society in his hands or under his control; which bond when approved shall be filed with the President.

The said officers shall perform such other additional duties as may be required and any of the duties and powers of said officers may be performed or exercised, as far as is lawful, by such other officers, persons or committees as the Executive Committee may provide.

Article 7. The Society shall hold its annual meeting for the election of officers, exhibition of fruits, and discussions, in the city of Madison, Wisconsin. Other meetings shall be held at such time and place as the Executive Committee may direct.

Article 8. Only persons holding memberships according to the regulations of the Society shall be members of it.

Article 9. This Constitution, with the accompanying By-Laws, may be amended, at any regular meeting of this Society by a two-thirds vote of the members present; provided that such amendment is presented in writing.

RULES AND BY-LAWS.

Article I.—Membership.

Sec. 1. The Secretary shall decide upon all applications for membership in accordance wi'h the Constitution and By-Laws of the Society.

Sec. 2. Any member maliciously or intentionally injuring or working in opposition to the Society or its purposes in promoting horticulture may upon return of his membership fee be summarily expelled.

Article II.—Meetings.

Sec. 1. The Executive Committee may fix the time and place for holding the annual meeting of the Society, if the last meeting thereof failed to do so, and may call such meeting by giving at least thirty days' notice to each member. Such notice shall be given by the Secretary, by mailing the same, postage prepaid, to each member at his last known address.

Sec. 2. Notice of a special meeting shall be mailed to each member at his last known address by the Secretary at least six days before such meeting is to be held. Such notice shall state the business to be transacted and the date, hour and place of meeting, and no business other than that stated in the notice shall be considered at such meeting.

Article III.—Duties of Officers—The President.

Sec. 1. The President shall preside at all meetings of the Society and of the Executive Committee; he shall, with the advice of the Secretary, call all meetings of the Society if the Executive Committee fail so to do; he shall appoint the delegates to the meetings of the other State Horticultural Societies; he shall have a general supervision of the business and affairs of the Society, and he shall deliver an annual address upon some subject connected with horticulture.

Sec. 2. He shall sign and acknowledge all leases, deeds, and instruments for the conveyance or transfer of the Society's property; and all other contracts, papers and instruments necessary or convenient in transacting its business.

Sec. 3. In case of the absence from any cause of both the President and Vice President the members present, if a quorum, shall elect one of their number temporary president.

Article IV.—The Secretary.

Sec. 1. The Secretary shall attend to all the correspondence of the Society, he shall keep a correct and complete record of the business and of the proceedings at all meetings of the members and of the Executive Committee.

Sec. 2. He shall superintend the publication of the Reports of the Transactions of the Society and publish or cause to be published such special bulletins on timely and appropriate subjects and such special reports of the condition and results of experimental work in the Trial Orchards and Trial Stations as the Board of Managers may direct.

Sec. 3. He shall present a detailed report of the affairs of the Society at its annual meeting. He shall endeavor to secure reports from the various committees, and from local societies, of the condition and progress of horticulture throughout the state and report the same to the Society. It shall be his duty to make a report to the Governor of the State of the transaction of the Society according to the provisions of the statutes for state reports.

Sec. 4. He shall be superintendent of all Trial Orchards and Trial Stations. In that capacity he shall supervise the planting and cultivation of, and exercise general control over the same, subject to the directions of the Trial Orchard Committee.

Sec. 5. He shall engross in the general record book of the Society a true copy of the Constitution, Rules and By-Laws, and all amendments thereto and all resolutions of the Society and of the Executive Committee.

Sec. 6. He shall keep a record book in which shall be entered the names of all members of the Society from its organization, the place of residence, time of acquiring membership, and time of cessation of same.

Sec. 7. He shall notify all persons elected to office within ten days thereafter, if such persons were not present at the election.

Sec. 8. He shall keep a book in which a correct list of the property of the Society shall be entered. He shall draw all orders, checks, etc., ordered by the Executive Committee or Board of Managers and countersign the same when signed by the President.

Sec. 9. He shall keep a stub or record of all orders, checks, etc., drawn and delivered, showing the date and amount thereof and to whom and for what purpose the same was issued.

Sec. 10. He shall receive all fees for membership, and give proper receipts for the same.

Sec. 11. He shall, before entering upon the duties of his office, execute a bond to the Society in such sum and with such sureties as the Executive Committee may direct, conditioned as provided in the Constitution.

Sec. 12. He shall receive and be responsible for the safe keeping of all moneys, notes, securities, credits, etc., of any and every nature, belonging to the Society which shall come into his hands.

Sec. 13. He shall keep proper books of account and a true and complete record of all business transacted by him for the Society; he shall keep proper vouchers for all money disbursed and shall render such accounts and statements of the moneys received, disbursed and on hand, and generally of all matters pertaining to his office as the Executive Committee may require or the By-Laws direct.

Sec. 14. He shall disburse the money of the Society only on the written order of the President, countersigned by the Secretary, and shall make an annual report of the receipts and disbursements and furnish the President with a copy of the same on or before the first day of the annual meeting.

Article V.—The Executive Committee.

Sec. 1. The Executive Committee shall have the general care and management of the property, affairs, and business of the Society, and a majority of its members shall constitute a quorum. The President and Secretary of the Society shall be President and Secretary of the Executive Committee.

Sec. 2. Meetings of the Committee may be called by the President, the Secretary, or by the Secretary on the written request of five of its members.

Sec. 3. They shall fix the amount of the Secretary's bond, the number of his sureties and approve the same. They may require any other officer, agent, or employe of the Society to execute a bond and prescribe the amount and conditions thereof, and approve the same.

Sec. 4. They may prescribe such salary or compensation for any officer, agent, or employe of the Society as they may deem proper, but not for a longer term than until the next annual meeting of the members, nor shall any officer of the Society be entitled to or receive any benefit, salary or compensation for, on account of, or during the time that he may be absent beyond the boundaries of the state unless such absence was at the request and on behalf of said Society.

Sec. 5. The Executive Committee shall have the power to remove any officer for official misconduct or neglect of the duties of his office. In case of vacancy in any office, either by resignation, removal or otherwise, such vacancy shall be filled by appointment by the said Committee, but such person shall hold office only for the unexpired portion of the term.

Sec. 6. The Executive Committee shall make such rules and regulations for the conduct of the business of the Society, not inconsistent

with law, the Constitution, or the Rules and By-Laws, as they shall deem expedient and for the best interests of the Society.

Article VI.—Committees.

Sec. 1. The President, Vice President and Secretary shall constitute a Board of Managers which may conduct any business deemed necessary for the Society in the absence of the Executive Committee. All bills against the Society must be audited by the Board of Managers before being paid.

Sec. 2. Regular meetings of the Board of Managers shall be held bi-monthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

Sec. 3. The President shall annually appoint a Committee on Finance of three members, and one member of the committee on Trial Orchards and Trial Stations, of three members, to be appointed for a term of 3 years, and such other committees as may from time to time be necessary.

Sec. 4. It shall be the duty of the Finance Committee to settle with the Secretary and to examine and report upon all bills and claims against the Society which may have been presented and referred to them, provided, however, that no member of the Executive Committee shall be a member of the Finance Committee aforesaid.

Sec. 5. The Trial Orchard Committee shall have general control of the locating, planting and care of all Trial Orchards and Trial Stations, and may visit collectively each orchard and station once each year or oftener if deemed necessary. Meetings of the Committeee may be called at any time by the President of the Society or by the Superintendent of Trial Orchards.

Article VII.—Miscellaneous.

Sec. 1. The foregoing Rules and By-Laws shall take effect and be in force from the date of their adoption.

AN OUTLINE OF THE WORK OF THE WISCONSIN STATE HORTICULTURAL SOCIETY

The Wisconsin State Horticultural Society conducts field work at fourteen different points in the state as follows:

Poplar, Maple, Whitehall, Manitowoc, Baraboo, Holcombe, Pewaukee, Gays Mills, Lake Geneva, Weston, Waupaca, Plover, Wisconsin Rapids and Onalaska.

A "Trial" orchard is located at each of the ten first-named places.

The Trial orchard work was begun in 1897 at Wausau for the purpose of testing the hardiness and adaptability of the different varieties of tree fruits in the northern or "cut-over" regions of the state.

These orchards comprise 48 acres and 3775 trees in addition to one acre of grapes.

The orchards at Poplar, Maple and Holcombe, are "Trial" orchards, being for the purposes above indicated.

The remaining orchards are located in sections where tree fruits are known to thrive and are designed as "Model" or demonstration orchards to show the best methods of culture, best varieties for market, etc.

An account is opened with each of the "Model" orchards with the confident expectation that a decided margin of profit will be shown at the end of 10 or 12 years. The orchards should then yield profitable crops for 20 years longer with but moderate expense for maintenance.

In the spring of 1921 four small fruit stations of one acre each were established in the four last-named places. These are for the purpose of demonstrating best methods of cultivation of raspberries, blackberries, etc. The work is carried on in co-operation with the county agricultural agents.

In these ways the Society hopes to demonstrate the possibilities of fruit growing in Wisconsin.

Additional Aims and Purposes of the Wisconsin State Horticultural Society.

Organized in 1865, being the legitimate successor of the Western Fruit Growers' Association, which was organized in 1853.

Chartered by the State of Wisconsin in 1871.

Purely an educational institution.

Its purpose the advancement of every branch of horticulture throughout the state.

Aims to accomplish this through publications, individual help and conventions (two yearly).

Issues an annual report containing articles by experts on orchard culture, small fruit and vegetable gardening and the decoration of home grounds. Sent free to members.

Issues a monthly magazine, WISCONSIN HORTICULTURE, which is sent free to members.

We Answer Questions

Individual help is furnished through the Secretary who obtains from reliable sources information on any horticultural topic. No charge for such services.

Receives an annual appropriation from the state for the support of the field work and other activities.

Extends an urgent invitation, a promise of help and the hand of fellowship to all who want to learn about the growing of fruit, flowers or vegetables; to all who love the beautiful in nature a hearty welcome is assured.

Cordially invites every person in Wisconsin who wants to know something about fruit, flowers or vegetables, to become a member, as such persons are needed to help along the splendid work in which the Society is engaged.

FREDERIC CRANEFIELD,
Secretary W. S. H. S.,
Madison.

WISCONSIN HORTICULTURE

A WISCONSIN MAGAZINE published by the **WISCONSIN STATE HORTICULTURAL SOCIETY** containing each month articles on fruit, flower and vegetable growing written by **WISCONSIN** growers for **WISCONSIN** conditions.

In this respect it is in a class by itself, as horticultural papers published for profit must cover the whole country.

WISCONSIN HORTICULTURE is not published for the purpose of making money, but exclusively for the benefit of the people of Wisconsin.

It is better—for **WISCONSIN** people—than any other horticultural paper published. It tells the best varieties to plant in **WISCONSIN**, the best methods of cultivation for **WISCONSIN.** It's a paper for the home gardener and fruit grower as well as for the big grower.

"WE ANSWER QUESTIONS" is the slogan of the society. Every question answered, first by personal letter and then in the paper.

Every dollar received for fees (subscriptions) and advertising is put into the paper.

Honest nurserymen advertise in **WISCONSIN HORTICULTURE** and only that kind. The other kind cannot buy space.

The price, one dollar, includes membership in the **STATE HORTICULTURAL SOCIETY.**

No formal application necessary; send fee to secretary.

FREDERIC CRANEFIELD,
Secretary W. S. H. S.,
Madison.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

ANNUAL CONVENTION, JANUARY 11, 12, 13, 1921.

Morning Session, Tuesday, Jan. 11.

THE PRESIDENT: We had with us a year ago a fellow citizen who told us that this was our building and to take it and make the most of it. Now, at the present time, he has been raised to the position of Chief Executive of this State, and he may want to change the specifications. I have the pleasure of introducing to you the Honorable John J. Blaine, Governor of the State.

ADDRESS OF WELCOME

GOVERNOR J. J. BLAINE.

Mr. President, Ladies and Gentlemen of the Horticultural Society:

I did have the pleasure a year ago of delivering to your Society the address of welcome, then as Attorney-General, and also as a member of your Society. I might also state this morning that I am still continuing to be a member of the Society, though I have not the opportunity to work out the practical part of horticulture.

Located in the city of Madison, as we are, between these lakes, we are somewhat crowded for room, so we hardly have the opportunity to grow and raise a cherry, a plum, an apple, or even an ordinary flower of any kind, and I have felt that one of the sacrifices that I have made in assuming official duties has been the sacrifice of my orchard and my garden. I do not believe there is anything that gives such a splendid vision of life and of society as that which you acquire from the calling of horticulture. As I

said a year ago, horticulture involves not merely the growing of those things which we eat, but also those things which give joy at the wedding feast and a tribute at the bier.

Now, fellow-citizens, as Governor of the State of Wisconsin, I appreciate the opportunity to welcome you to our state capital and to the state house, and, as the president has suggested, it is yours. I am very sorry that you have been crowded into this room. You understand the legislature meets tomorrow at noon. I inquired of Mr. Cranefield, why not meet in the senate chamber, or the assembly chamber, but there was some feeling that the legislature might feel the intrusion, and of course I have no control over the legislative assembly halls. But, nevertheless, it is not a matter of room, or building, it is a matter of the spirit in which you conduct your meetings that counts for the welfare of mankind, and it is that spirit in which I welcome you this morning to this capital and to this building, and I know that all your efforts will be put forth toward the development of the higher ideals, and, after all, life is quite worthless unless we can develop the higher ideals in whatever occupation or calling we may be engaged. It has been said that a man who lives in a hut in the woods, if he has something that develops the ideal, then millions will cause a beaten path to his door. And so with you, ladies and gentlemen, the development of the ideals of horticulture here along the line of beauty or utilitarian lines, the development adds so much toward civilization and toward the upbuilding of mankind.

In this spirit I welcome you, and I know that your efforts will be put forth along those lines, the development of this splendid undertaking, that you will continue along those lines which will make Wisconsin foremost in beauty and in utilitarian undertakings. And so, Mr. President, to you and to your Society, my own Society, I extend this welcoming hand, and with the knowledge that all your deliberations will be in the spirit to which I have referred, and assuring you that so far as I can personally or officially co-operate in assisting you, I shall be glad to do so, whether at this convention or in years to come, no matter what position I may occupy.

THE BACK YARD GARDEN

By Mrs. William C. Kroening, Milwaukee.

(From Reporter's Transcript)

I had the pleasure of appearing before this association about four years ago, at Oshkosh I believe, when we made the first report upon the vacant lot and back yard garden in Milwaukee, and of course then it was very much in its infancy. Now, those of you who do not live in a large city can have very little sympathy with our garden in Milwaukee, because in gardening as you see it, you have no big fences to contend with, no houses standing next to you, no garage next to you, nobody dumping their ashes over your fence, and all those things that make our gardens rather a problem in Milwaukee. But after appearing before the common council of Milwaukee and bringing to them the subject of gardening and representing to them of what intense interest it would be to the people in Milwaukee who cannot have a garden in their own back yard and were of necessity required to go somewhere else, they then appropriated $1,000.

This $1,000 is for the purpose of encouraging gardens. The money is used to plow lots free of charge for those people who wish a garden and cannot afford to pay for it; it pays the expenses of the commission, but no member of the commission draws a cent of salary; approximately 25 per cent of it is used for prize money. Then some of the money is used to purchase ribbons and incidentals for use in public schools.

The reason that the commission picked upon gardening as a practical recreation was, that the thing we really had to look for in Milwaukee was this, that within the last twenty years the population in cities had increased 100 per cent, while in the outlying country it only increased 20 per cent, throwing production on the 20 per cent out in the country, and gradually, as production decreased and consumption increased, the cost of living became higher and higher.

We found also that there was a necessity for recreation close at home. That all the recreation provided by the city of Milwau-

kee were those recreations that tended to separate the individual from the home proper; that in order to make the parks available it was necessary to have transportation, and many other elements entered into making it practical to go to the parks. There was no recreation provided for those older people at home who could not go to the parks and who would gladly contribute to the support of the family if they were given a chance. A man seventy years of age, not able to go into the industrial field, if he could work in a garden could contribute to the support of the family without any inconvenience to himself.

Then there were the children with short hours in school, and from three to eight o'clock out in the streets, and it was necessary to find something for them to do.

There were so many vacant lots in the city of Milwaukee which could be used for garden purposes and which were littered up with tin cans and used as playgrounds for boys, which brought about broken windows. Some of them were so covered that we did not know what the soil looked like.

Those were the reasons why the commission decided to go into gardening, and we went into it, and it was not an easy task. First of all the objection was raised that anything you can raise in the back yard you can buy much easier in the grocery than you can raise it. People do not know the joy that there is in seeing things come out of the ground, growing day by day.

We tried the question of education in gardening for several reasons. First of all we felt that gardening was the first practical occupation of man after he left Eden, and just as the snake was present there, so the snake is present in Milwaukee in the shape of smoke, and so on. We have been able to keep snakes out of the garden pretty well, a few knockers, but the boosters are the bigger part of the scheme. We decided that the only reason mankind was out of the animal class was this power of production. He was lifted out of the lower class of animals, because animals may be able to secure food, but I do not know of any animal that can produce food. He may be able to provide shelter for himself, but no food, that leaves you and me out of that class.

In reply to the question, "Why do you have a garden," a woman told me, "Well, if I want to make a bowl of soup, I do not have to go to a grocery store to buy a bunch of carrots, I just go out to

my back garden and pull one carrot, one plant of parsley, one of everything, and I will have a good soup. But if I went to the grocery store, I would have to put on a different dress, change my shoes, waste my time and probably stand and gossip with a friend. So I found that by having that back yard garden we would save time and also money."

Then we found that the garden movement was a great community factor, that with the increase in size of cities you had forgotten who your neighbor was; if he had more than you had you were jealous; if you had a little more than he had, you would feel just a little above him. Very often we found where there was a garden next to a chicken coop, when the chickens got out, that would destroy the spirit of the community but then they would lock up the chickens and harmony would be restored.

It was fortunate that during the war there was an order came from the government that it is unpatriotic to shoot or interfere with pigeons of any kind. Now, they interfere a whole lot with our gardens, so it was necessary for us to interfere with the government order, and, being diplomatic about everything, I went to the city attorney's office and asked, "What does the term 'interfere' mean? Suppose these people have a piece of poultry netting above the garden, does that interfere with the pigeon?" He said, it might. "Well," I said in good American slang, "We should worry, we will let them get tangled up and we will go into the supreme court." And we did get into court and we won out.

When we went into this work we divided our gardens into two kinds, vacant lot gardens for adults and children's gardens. The children's gardens we turned over to the supervision of some one connected with the school board; he receives no salary and we give him the munificent sum of $15 for expenses a month. So there is no graft. We are pleased to report that we have 7,000 children in the city of Milwaukee interested in gardening, and in the fall of the year we had 45 exhibits in the public schools and we awarded three ribbons, first second and third prizes, no cash prizes in the public schools, and the first prize winners then took their exhibits to the city hall, to the Grand Central Exhibit, for which we gave a cash prize of five dollars, in each class, $3, $2 and $1, and there were sixty cash prizes for the children at the

Grand Central Exhibit and you would be surprised at the ingenuity of some of the children exhibitors. One little fellow had a little wagon with a man sitting on it that had been built out of a cabbage head, and he had to use carrots for arms, and if Professor Moore is here he will probably tell you that the little boy received a special prize for that. Two or three of them were about the same way. A citizen donated two beautiful silver loving cups to give to the schools that had the best exhibit, and the Riverside High School took the private school prize, and the Scott Street School took the public school prize.

We are attempting to get a paid supervisor. Of course we have no money, and perhaps it will work out as well without a paid supervisor. And we have registered every vacant lot in the city of Milwaukee, its size, owner, its desirability as a garden, what ward and precinct it is located in, at a moment's notice we can tell you where the lot is located, whom it belongs to and what its condition is. We have a check book system by which the gardeners know how big a place is, and if he is getting the plowing done free or paying for it, and I think we have been a great help to real estate men. Very often they come into our office asking us whom the lot belongs to, which they do not seem to be able to find out elsewhere.

Then we have lectures at the public museum, although they were not as well attended as they should be. Still, we felt that those there were not curiosity seekers, that they were really interested in gardens.

We also furnish the fertilizer free. All the leaves and all the street sweepings go on the lot, provided the lot is not fenced in. Where it is fenced in, we dump it in the alley. There was not a single load of street sweepings taken out of that district, every bit of it went into the back yard gardens.

We sold to the gardeners 20,000 packages of seeds at 3 cents a package, and we could have sold a great many more if we had obtained them a little earlier. We are contemplating next spring selling them on the public market in the city of Milwaukee and these packages are put up in one big bunch of five packages at one time, lettuce, carrots, peas, beans, beets, cabbage. Some people came for miles to get these seeds.

We distributed 10,000 pieces of literature, 2,000 Wisconsin Horticulture and there were 6,000 Colony Garden Guide, a very nice little book, nicely colored. We had a great many calls for that, and I am expecting we can get enough of them this year, and probably Mr. Cranefield will furnish us with Wisconsin Horticulture; we have had a good many calls for that, because it is very simply written and we can give it to the school children to study and it is comprehensive, the language is such that almost any one can read it and understand it that understands the English language. You will understand that most of our gardeners are of German birth.

Now then, to get down to the acreage. The city of Milwaukee has 500,000 inhabitants and I think our gardens cover about 25 acres. We have 25 wards, and taking them ward by ward, such wards as have large gardens, we find that in the 18th ward we have one tract of 17 acres that we have cultivated now for four years, and in that 17 acres there are 225 families and this 17 acres is divided up into plots, 50 by 50, and the gardeners in this plot pay $1 for each plot. For that dollar they receive the plowing and receive the water free of charge. They are provided with such necessary instruction as they want, and of course they get help from the commission in planting anything they desire, free of charge if they want aid. In that plot you would be surprised, the banker is just as democratic as the poor Italian laborer, and I wish some of the people here would come to see our gardens. People come from all situations in life, and it is just as democratic as can be. There are lots through the whole ward that are being cultivated, not by people that want to do it to increase their income, but because we have created in them a love of gardening, and I am very proud of it. We have kept at it, and I am going to keep at it.

EVERYBODY'S GARDEN

SEVEN VARIETIES OF TOMATOES FOR EVERYBODY'S GARDEN AND THE BEST ONE; THREE WAYS OF TRAINING TOMATOES AND THE BEST WAY.

HENRY T. SHELDON, MADISON

When Mr. Cranefield spoke to me about making this talk, I should probably have refused if he had suggested any other subject than tomatoes. I do not feel that I am qualified either by knowledge or experience to discuss any phase of gardening before this body, but he assured me that what was wanted was the experience of the ordinary "dub gardener" rather than the expert, which made me feel a little easier, and then this subject of tomatoes appealed to me at once.

I do not think there is any vegetable raised in the ordinary garden out of which we can get as much fun and satisfaction as we can out of the tomato; when you go out to the garden and gather a fine basket of tomatoes, you really feel that you have something to show and talk about, and you know that a whole lot of the satisfaction you get out of your garden is in talking it over with your neighbor, who also has a garden, and comparing your crop with his and swelling up a little if your tomatoes are earlier or bigger or more abundant than the ones in his plot.

Then the tomato is a vegetable with which it is hardly possible to make a complete failure, it is singularly free from disease or the attacks of parasites, it will withstand too much moisture or too much dryness, and even if you neglect it and do not cultivate it, it will struggle gamely along and produce pretty well even under the most adverse conditions.

However, they should not be left to fight it out alone for there is nothing in the garden which will respond to care and cultivation more willingly; a little thought in selecting the location and a little care in planting and cultivation and they will work their heads off for you the whole summer long.

And the fact that it has such a long season of production is another thing that endears the tomato to the hearts of the amateur gardener. There is no necessity of making successive plantings and they leave no blank spot in the garden after the first crop is picked, like our peas and sweet corn, but from July until frost they go cheerfully ahead, always to be depended on.

I like a medium soil, neither too rich nor too thin, a very rich soil makes the plants run too much to vines and on a very thin soil they will not produce up to their limit. The ordinary back yard soil is about right for them as a general thing, and with a little bone meal or other commercial fertilizer dug in around the plants about the time the first fruit forms, they should do splendidly.

One great advantage of tomatoes over some of the other transplanted vegetables is that they do not seem to be set back by transplanting and so can be developed much further in the hot bed or cold frame before transplanting so that a very early crop may be obtained; plants on which the fruit is already formed are frequently set out without any bad results, as they do not seem to mind the change at all if they receive a little more care for a day or two in regard to shading and watering. In order to get earlier fruit, I think one can do better raising his own plants from seed than by buying them, seed sown in flats and in houses in March and moved to the cold frame when the season is right are usually much better advanced than the plants commonly found in the market.

Now to get down to the subject assigned to me, "The Seven Best Tomatoes." Of course there are a great many good tomatoes I have never tried and my experience is limited to a comparatively small number so that I do not think my opinion is worth much. However, I think we will all agree that we want at least one very early variety in the garden. I can't imagine anything more galling to the ordinary gardener than to have his neighbor lean over the fence and say something like this, "Oh, aren't your tomatoes ripe yet, we have been having them for over a week." So I feel that just to keep one's self-respect and be able to hold his head up he ought to have one of the real early ones. Of these, I know of no better than Earlianna and Chalk's Early Jewel, both of these are as early as the earliest and abundant producers, have

a good color, a smooth skin and run quite even as to size. I always have one or both of these in my garden.

Then for the later varieties, there is an almost unlimited choice and a great chance for a difference of opinion; to some of us. If size is important Ponderosa makes the strongest appeal, others who like a fruit which is smooth and runs more evenly as to size, and then there is the question of color as between the bright red and the pinker shades and with so many good ones to choose from it really narrows down to a question of personal preference.

However, if I were choosing five or more varieties to go with the two earliest already named they would be about as follows: Bonny Best, John Baer, Burpee's Matchless, Burpee's Dwarf Giant and Henderson's Whole Salad. These are all standard well-known tomatoes except possibly the last named. They are all willing workers and heavy producers, the fruit is handsome and good for eating either raw or cooked and also for canning.

I have put Burpee's Whole Salad in the list even if it may not produce quite as many pounds of fruit as some of the others, but there is no other tomato shows up better in the amateur garden. The rather small fruit is borne in clusters, sometimes as many as twenty in one cluster, and looking like a bunch of immense bright red grapes, then it has a fine flavor and as its name implies is just the size to serve whole in a salad, making it a thoroughly satisfactory type.

It may seem strange to make a list of seven best varieties and leave out such a general favorite as Ponderosa, but personally this tomato has never particularly appealed to me; of course, it is great fun to raise such thumping big tomatoes, but these very big ones never seem to ripen as evenly as the medium-sized varieties and being a ribbed variety they are more apt to split than the smooth surface sort, and also their great weight sometimes breaks down the vines unless great care has been used in tying them up.

To pick out the one best variety with so many good ones to choose from is certainly a hard task. I think if I were limited to one sort I would choose Bonny Best, which has a great many points in its favor; it is medium early, coming not long after Earlianna, has a splendid flavor, a bright rich red color and a smooth unribbed surface, altogether a combination that is pretty hard to beat.

Now as to methods of culture, the three most common methods are, first, letting the plants run on the ground unpruned and without support, this is the plan of most of the gardeners who raise tomatoes on a large scale and I must say it seems to work pretty well; however for me this plan has one great drawback and that is that it makes cultivation difficult, and if I find that it is going to be rather hard to hoe among the tangled vines I am very apt to make that an excuse to scrimp on the tomatoes and transfer my attention to the beans or corn which grow in neat hills, and so the tomatoes get the worst of it. I do not know whether there are any others among you who don't care much for hoeing but of course there may be. Another objection to their method is that you lose the ornamental effect furnished by rows of well-supported vines with their handsome red fruit and appearance, which always counts for something with the amateur gardener.

The method of supporting the plants on trellises of lath or wire running the length of the rows is a popular one and works well, the only objection I have to it is that cultivation is not quite so easy as when each plant stands by itself. The making of the trellis involves less labor than the staking of each plant and as the plants show up well it is a very satisfactory way.

My own favorite method and the only one I use is to stake each plant separately, pruning off the laterals to leave three or less, and using a stake at least four feet long. In this way one can get all around each plant with his hoe and keep them perfectly free from weeds, or he can run his wheel hoe across the rows between the plants as well as up and down, the fruit is kept off the ground and so is clean and attractive when picked and the plants show up better than if handled in any other way. Whether it is best to prune off any of the laterals so as to have only one vine or whether to have two or three stems is a question I cannot answer. I know that the one stem method is highly recommended but I have never tried it myself; I have seen it tried however with splendid results.

When the plants have been pruned and staked I pick off the suckers which come at the axils of the leaves on the main stems, this tends to keep the plant from running too much to vines and leaves and preserves its strength for fruit bearing.

For a stake, I like a rough piece of branch or sapling better than a lath or sawed stake, the plant will cling to the rough places and your twine is not so apt to slip, however, the sawed stake does very well if the other cannot be obtained.

DISCUSSION

THE SECRETARY: A question occurred to me when I was reading this paper, how the gentleman distinguished between Bonny Best and John Baer?

MR. TOOLE: I have grown them both and find the Bonny Best is a little sturdier and not more than two days later than the Earlianna.

A MEMBER: I exhibited the two at the county fair. I put the two together, I could not distinguish them after I got them on the plate, got them mixed up. In the frame I can distinguish them, because the John Baer is a little sturdier plant, the Bonny Best in the flat grows a little more spindling with me, but in the field I cannot distinguish them.

MR. CHRISTENSEN: There is a slight difference. The John Baer is inclined to run small and the foliage is a little lighter, a little smaller foliage than the Bonny Best. But I find the John Baer is from five days to a week earlier than the Bonny Best. It is not quite as firm a tomato as the Bonny Best.

FLOWERS FOR EVERYBODY'S GARDEN

MRS. C. E. STRONG, WEST ALLIS

I do not know if Mr. and Mrs. Everybody are here or not—if they are I want to say to them, that I think they gave me a pretty hard task.

I started out asking different people what they liked best—I failed to find two who agreed. So I decided to answer the questions as I could—if Everybody wasn't satisfied, why there are many other flower growers here, who no doubt would be glad to help them. These are the questions I have been asked to answer: The Everybody family own a home; they are very much interested in flowers and would like a list of bulbs, annuals and perennials that are easy to grow. They haven't very much money to spend but they want a lot of flowers the whole season, both for

show in the garden and to cut. They intend to learn about the culture later.

Pretty plain questions, covers the ground. There's just one thing left to my imagination and that's the size of the garden. I decided the only thing I could do, was to give a large enough list so no one could feel slighted. I am quite sure of one thing, the Everybody family is starting out right in asking for a list early, so they can order the seeds and plants. This will save them a great many disappointments. Was also glad to know they intended to find out how to take care of this garden. For no matter how good the list may be, everybody is going to be disappointed, unless the seeds and plants are cared for properly. From my own experience in gardening I have found it is not necessary to spend a large amount of money for flowers as a great many of the best perennials are easily raised from seed.

Any or all of the following list sown early in the spring will grow readily and many will bloom the first year: Arabis Alpina, Saxatile Allysum, Sweet Rocket, Sweet William, Longspurred Columbine, Lychins, Gold Medal Hybrid Delphiniums, Fox Gloves, Gaillardias, Pyrethrums, Shasta Daisies, Oriental Poppies, Myosotis Pallustris Semperflorens. I wouldn't advise Everybody to plant all of these at once. The best way would be to read up the descriptions in the seed catalogues, then pick out five or six they think they would like best. If they are careful about following directions about sowing and caring for them, they will soon be ready for all the rest. There is one perennial not given in this list I wish Everybody would try raising from seed. Perennial Phlox is one of the most satisfactory showy plants grown in a garden and one of the easiest grown from seed. I have a large bed of these plants that in my estimation equals if it does not exceed in beauty any other collection I have ever seen—it was grown from fifty cents worth of seed. I think it's the best advertisement for the nurseries in West Allis, for everybody who sees them proceeds to order some phlox plants. I wish to tell Everybody they can do likewise but it's not done in one year nor without considerable work. They need careful weeding out of some sort or your phlox bed will be ruined. If I should try to tell you at this time how I found out all I have about Phlox nobody would ever hear the rest of this paper. Everybody here knows the reason, fifteen minutes the limit. This much I can tell

you though, get your seed in October and sow it immediately—it needs the freezing for perfect germination.

There are a few things I would advise everybody to buy,—bulbs of course. Tulips, Narcissus, Daffodils are the indispensables in Everybody's garden. I prefer double tulips because they are more lasting—also very fine for cutting. Salvatore Rosa, Courrone Dor, Tournesoll, Ball of Snow, are the best I think. Narcissus Alba Plena Odorata for double and Narcissus Poeticus, single. For Daffodils the old Von Sion is a standby. Right here I want to tell Everybody something I know Somebody will disagree with. Dig up your bulbs only about once in three or four years, and sow the seeds of annuals amongst them early in the spring, such as Nigellas, Clarkia, Godetia, Dianthus, Candytuft, Verbenas, Gypsophila. These give you later a plentiful supply of cut flowers and shade the ground so the hot sun will not hurt your bulbs. Iris—you will want some of the early Pumila, whose buds show early in the spring. Then Iris Siberica, white and violet blue. When you get to the Tall Bearded Iris, you can spend much or little for after this beautiful flower has gotten into your garden, she will make you reckless, you will forget you cannot afford to spend money for flowers. However no matter how much or little you spend, the charm of this flower is the same, each opening blossom gives you a new thrill. These should be planted surely, Florentine Alba, Madam Cherau, Mrs. H. Darwin, Pallida Dalmatia, Plumeri, Sherwin Wright.

Do not be afraid to try a few of the gorgeous Japanese—all they need is a heavy covering of cornstalks as they are not quite hardy everywhere.

Does Everybody want Peonies? If they are anything like myself they do. Here are six, none costing over a dollar, very free blooming—Festiva Maxima, Golden Harvest, Mons Jules Elie, Felix Crousse, Queen Victoria, Delachei. You need not envy the possessors of the more aristocratic members of this family, there may be many just as beautiful but none more satisfactory. To help out in that lots of cut flowers—sow some more annuals in your Peony bed. Tall branching larkspur, calliopsis, bachelor's buttons or centaurea if we give them their proper name, snap dragon. Gladiolus—the only trouble with these are the more you have the more you want. To me they are about the last word in cut flowers. I shall not attempt to give you a list of the best ones,

do not believe I am equal to this. However I know a garden wouldn't seem complete without America, Panama, Chief Oshkosh, Peace and Schwaben.

Almost all catalogues paint alluring pictures of great clumps of lilies—easily grown, perhaps they are by professionals but not by the average amateur. Lilium Elegans and Lilium Tigrinum are easily grown, soon forming good sized clumps, while Lilium Candidum or Madonna Lily is perhaps the most beautiful and yet can be grown by everybody. I am sure Everybody will be glad to know how to secure a large clump of these lilies in a few years at a very small expense. Take one or two bulbs—carefully break off the outer petals, I'm calling them this for want of an easier name, as the bulbs look as though they were composed of numerous fleshy petals. Plant them where you want your clump of lilies to be, cover with about two inches of ground then plant a double row of Chinese Delphinium around them as closely as you can—in three years you will have a fine show of lilies. Don't attempt to grow the lilies without the Delphiniums, there's a charm there, if you break it, you will be disappointed.

Everybody should have at least one plant of Clematis Recta in their garden; it is a wonderfully attractive plant with its masses of creamy white fragrant blossoms. So are the Goat's Beard or Meadow Sweet—properly named Spirea. If you have a damp spot in your garden a clump of the rose and white feathery plumes of the Meadow Sweet will delight you for several weeks.

I wonder if Everybody forgot to mention Roses—am sure they didn't leave them out on purpose—for whoever heard of a garden without Roses. Everybody plant a few anyway—Frau Karl Druschki, General Jack, Mrs. J. H. Laing, Hermosa, with Dorothy Perkins and Flower of Fairfield for climbers. Just to make sure there are flowers for Everybody I hope they will plant a few of the old fashioned June Roses, the kind that only bloom once a year, but the kind that you pick armsful of—pink and white roses to give to somebody who is homesick for a sight of real roses once more—and still have plenty to look at.

By the time Everybody has planted all these flowers Nobody will remember me and this list. Everybody will be busy either working in their own garden or helping Somebody start a new one. Everybody will be happy—and so will I.

PEAS AND BEANS FOR EVERYBODY'S GARDEN

WM. LONGLAND, LAKE GENEVA

Fresh peas in June picked from your own garden are generally acknowledged by all to be one of the best of vegetables. We are all generally hungry for them. Although they are one of the easiest crops to grow, it is sometimes very hard to keep a good succession, where they want and expect fresh peas two and three times a day as long as the season lasts. I have never yet found when I could depend on three varieties to do this as a spell of real hot weather will stop growth on a later planting of a variety and practically bring them to maturity the same day with a half crop of peas.

The ground I use for peas I have fertilized and spaded in the fall, the soil thrown up as rough as possible. This allows one to get in his crop earlier in the spring, the soil drying out quicker. If the ground is dry enough the latter part of March, I put in my first crop, or as soon afterwards as possible. I cultivate the ground, break up the large lumps but do not rake it fine. I plant in a shallow trench, thrown out with a spade about 3 inches deep and loosened at the bottom with a cultivator hoe, thus the seeds are two inches deep when covered.

At this time I plant Gradus for 1st, Marvelous for 2d, and Sutton's Excelsior for 3d. I do not plant again until I see the peas bursting out of the ground. Then I plant Senator and Dwarf Telephone. In about 7 to 10 days I plant Stratagem, Senator, Advancer and Everbearing. It depends on the weather conditions whether or not I plant again as our garden is in the woods and does not get the winds like an open garden. I do not grow the June type of pea such as Alaska, Maud S., etc., because they are only about two days earlier and have not the flavor of the wrinkled varieties or Marrowfat. All the peas are grown on chicken wire built on a trellis made of stakes driven in the ground eight feet apart with a pole fastened at the top. I use binding twine to keep them to the wire as they grow very vigorous in our rich

soil. We cultivate between the rows as often as possible as they like plenty of cultivation. I change the location every year. Peas planted early will generally do well in anybody's garden.

BEANS FOR EVERYBODY'S GARDEN

French Beans or Stringless Beans as they are generally called are I think one of our earliest vegetables to grow and keep in succession. The three best varieties that I know to be prolific and very long bearing are 1st, "Cook's Prolific," long, stringless, round green pod; 2d, "Sutton's Masterpiece," stringless, long flat, green pod; 3d, "Farquahar's White Wax."

The ground is prepared as for peas. I generally plant the first crop of beans the latter part of April or as soon as the weather permits. I draw a wide drill with a hoe and sow all along the row, allowing 20 to 24 inches between rows. I plant these three varieties at the same time. These start to bear as numbered. For succession I plant every ten days till September. While they are bearing I never pick them when they are wet, always picking them in the afternoon as it prevents rust. Then I always pick what is ready to pick as they will bear very much longer that way.

Sometimes in midsummer the bean hopper will do damage just as they make their first leaves by sucking all of the juices out of the leaves. I take white mosquito netting in long strips and lay it over the beans until they get larger. Then take it off and put it over the next succeeding crop, this way they are not hurt as it is in the young stage when the damage is done. Cultivate well but never in the morning when the dew is on the beans, wait till they are dry.

LIMA BEANS

The ground is prepared as for peas and beans. As a rule there are many complaints about lima beans rotting in the ground. Generally the reason for this is a cold wet spell just after the beans are planted. For the past 17 years I have not had any trouble that way. This way takes a little longer but it is sure. Chop out a hole with a hoe every foot, drop in a handful of sand, push three or four beans in the sand edgeways and cover up lightly with soil. This way they will not rot or break their necks in coming up, which the large varieties are apt to do.

BUSH LIMA

I plant bush limas 15 inches in a row 3 feet between varieties. 1st, Henderson's Bush Lima, 2d, any variety you fancy. Follow with Tall Lima. 1st, Early Leviathan, 2d, King of the Garden.

POLE LIMAS

Plant pole limas one foot in a row five feet between varieties. Drive poles in the ground 10 feet apart and staple a wire on the top and about one foot off the ground. Tie binding twine between the two wires at intervals of one foot. They climb this very easily. Cultivate the same as peas and beans.

FRUIT FOR EVERYBODY'S GARDEN

BY MR. N. A. RASMUSSEN, OSHKOSH

(From Reporter's Transcript.)

I take it the Secretary meant small fruit for the back yard garden as this is a session entirely for the home garden, and I am going to confine my talk mostly to the strawberry and raspberry for the back yard garden, and to the varieties as much as to the culture.

I think the back yard and farm garden people have learned some things about strawberry growing and got them definitely fixed in their minds that it would be better to forget. One of these is that you must have two varieties in order to get a crop. That is the thing that we ought to forget. And then I want them to forget that there is anything but Senator Dunlap at all, that there are any other varieties worth planting, and I think that they would have a great deal better success with strawberries. Commercially that could almost be said, but still in some places, for long shipping, we want the Warfield because it is a better shipper. There may be certain places, certain kinds of soils, that other varieties might prove a little better, but I would say, plant the Senator Dunlap and plant that alone. It is not necessary to have two varieties to get a crop if the one variety planted is a perfect flowered variety like the Dunlap. Some varieties, the Warfield is one, that are imperfect flowered must be planted alongside some perfect flowered kind or there will be no fruit.

The Dunlap will not stand crowding as well as the Warfield, and we know in gardens, we get the most berries on the outer edge of the row. Keep the plants thinned out, so no two plants stand closer than six or eight inches apart. Although the finest strawberry patch I have ever seen was in the city of Milwaukee and they were grown in a closely matted row, I doubt if most people would make a success of it.

I would want as many strawberries as I could get, so I would have a row about three feet wide. You can easily pick across that, and then have a path about a foot wide. I am speaking strictly of the back yard garden. When setting plants I would set them 18 inches apart in the row. Then if we keep distributing our runners, we may have no two plants closer than 8 inches —6 might do, but I think 8 would do better. Plant as early in the spring as possible, trim the roots but very little. You have seen pictures in catalogues and garden books where the root is shown severely pruned and it is misleading. I should say, cut very little, if any, just trim the lower edges of the ragged roots. They will reach down to moisture and stand dry weather better than if pruned shorter.

I say, I wanted them planted as early as I could, but do not plant until the leaf of the new year's growth was as large as a clover leaf, and then I would cut off everything except that one new leaf. I think most diseases of strawberries are carried over on the old foliage, and we ought to leave that all at the house and burn it up and not take any with us to the field. I think that this practice controls to a very considerable degree the leaf roller and leaf spot and the different diseases we have on the foliage.

In planting I would never use a stick to make the hole with. I would use a shovel or spade, shoving it down straight, leaving a flat surface to put the plant against and press it in, and in this way every root comes in contact with the ground, and if I did not press down, then when I walked back I would be careful to step on the top of every plant when I was walking, being careful not to break off the heart leaf, but get the ground pressed firmly.

Then, if you do not have any other tool than a garden rake, keep raking the soil before the weeds appear, I think a rake would be far better than a hoe. Land that will grow good potatoes and sweet corn will grow good strawberries. I would like

the foliage to get up to 8 inches high, or 10 inches the first season, and if it did not get up there, I would get chicken manure, or some other manure very high in nitrogen to bring it up that high.

The ever-bearing strawberry has a place in every garden, but we must remember that it requires twice as much work for half as many berries. That is the best we have been able to do, and I do not think we would ever get enough for canning from the ever-bearing varieties in an ordinary back yard garden. They want more petting and a little better care. The ever-bearing strawberry must not be condemned, and I do not think any garden is complete without it, if we have space enough to grow both kinds. I do not want to condemn a great number of other good varieties of strawberries that you may have tried. If I knew someone that had a strawberry patch just across the fence from my garden that was doing fine, I would not care what variety they were if they suited me, I would get the plants there, so as to get them as near home as possible.

The first season we will usually have too many runners, but after the plant is well established, I would leave them all until I had the number I wanted and then clip off all that appeared later in the season. Commercially we cut off some of those runners, until the plant is strong. We can cultivate and keep the soil free from weeds easier. If your garden patch is large in your city garden, it might be well to cut off a few of those runners for the first two or three weeks, keeping the ground thoroughly stirred, and then let all the runners grow.

I know there are some of the professors here from the university, and some of the commercial men that will not agree with me, but I am still of the opinion that some plants have a tendency to produce a large number of runners and less fruit, while others may produce a larger number of berries and fewer runners, but that is only my personal opinion and I have nothing to prove it, and some say that they have carried it far enough to prove the contrary, which may be so.

In raspberries I do not think we can confine ourselves quite as closely to one variety. I think raspberries are a little more particular as to the kind of soil they have. One might do better in your garden and another do better in mine, but I think that the

King Raspberry (red) as I have seen it will do better on a larger variety of soils than will at least most other varieties. The Cuthbert may do well on your soil, but it is a rank grower, it shades the home garden, that is, it is very tall, but the fruit is the finest of all raspberries. The Marlboro is a very bright, attractive berry, does not grow large, is easier to harvest and does not sucker as bad in the garden, which is a big advantage. But in general, we like the King best. That makes three, and those are the only ones that I have seen growing that I would call successes in this state, although I suppose there are more.

Now, we have the everbearing raspberry, and I know in certain cases they have done very well, and the nurserymen all have them to sell and they have their place, but I do not think they are equal to the everbearing strawberry. We will get less returns. They are not successful with me after the first year, where the berries are good-sized and worth while.

I would plant all raspberries as early as possible in the spring and cut back the long canes. Most of the diseases of raspberries are on the canes, and as a rule the borers and most of those insects work on the upper end and if we cut down to one or two buds, leaving the stub end not over six inches long, I think we will eliminate most of the diseases and insects before we get them planted. Look on the roots for crown gall enlargement, a large, hard bunch on the roots which is very easily detected, and destroy such plants. In fact, you should very seldom get them in buying from a nursery that is inspected, as the inspectors will not allow canes thus infected to be sold.

Plant the rows 36 inches apart and a foot apart in the rows. You need more raspberry plants than strawberry plants, for they will produce only three or four shoots the first year. The first year after planting they will produce a few very fine berries, and if we use plants enough we will get enough more fruit to pay for the extra plants and very fine quality the first year after planting, so I would use plenty of plants. I would follow the same rule as I did with the Dunlap strawberry; thin out in the row, no canes nearer than 8 inches apart, a row about 16 inches wide would do in a city garden, then a patch three feet between that, although we have them wider than that commercially. Cut the canes down to three or four buds, the following spring, let them stand about a foot or 18 inches high.

I remember one year telling a man to cut down close, giving him a line on his waist, marked on himself, but he was conscientious and he kept cutting lower and lower and the lower part was down to a foot and I thought he had ruined the plants, but we had the finest raspberries on that row. The buds are stronger down lower, and while you will get less berries they are larger in size, so I think we get more quarts by trimming quite close.

As a rule I doubt if the back yard gardener will want black raspberries unless he has quite a good-sized garden. The blacks need about the same treatment as the reds, although they are grown different in one way, about three feet in the row, because they do not spread, they grow from a tip plant, there never will be any more plants in the row than we set. Cut back severely, not quite as severely, perhaps, as the red. I never do any summer pruning, only cutting back in the spring. Now, different parts of the state and different kinds of soil may require different methods, but with us the spring pruning has been most successful.

DISCUSSION

MR. SMITH: Do you give winter protection?

MR. RASMUSSEN: No, we depend on the snow. It lodges pretty well in a raspberry patch and as a rule it will bury them deep enough so we can hold three or four live buds. I did not say anything about cultivation, but I take it for granted that they get about the right cultivation in a city garden. Keep the weeds out, and if you do that, you will give the ground about stirring enough. The care you take in keeping out the weeds would be about as much cultivation as you need, but I want to mulch strawberries in the city garden. My lawn clippings would all go about the bottom of the raspberries, that would take care of the weeds and even moisture, give them all the fertility that they need if you have a lawn of any size. As to the strawberries, we want to cover them in the fall with any coarse litter that we can get, straw, shavings, anything that will not mat down too tight, and cover enough so that the foliage will not show, and then rake off enough in the spring just so they will break through. The more covering we can leave in the spring the better the strawberry plant will come up through; put the balance between the rows to keep down the weeds and hold the moisture there.

MR. MOYLE: What do you think of forest leaves as a covering?

MR. RASMUSSEN: Forest leaves are good, but I think we have to be careful in using leaves, as they mat down. I should prefer

branches, something that would help to hold those leaves up and keep them from smothering the plant. Leaves will lie as close together as shingles, and so there is danger of smothering with leaves.

MR. MOYLE: Have you tried the Dunlap to see if they do well in hill culture? Why not recommend these back yard gardeners to plant sufficient plants and keep one single plant, good, big, strong plant, cut off all runners, and raise choice berries. I do not knew whether the Dunlap is fitted for that mode of culture, but I know some of them are.

MR. RASMUSSEN: The finest strawberries I ever saw were grown in the city of Milwaukee, and they were Dunlap, I know, for I sold them to him. He took me out to see, and they were grown in hill culture, and I did not think it was possible to get so many fine berries as were growing in that garden.

A WINTER GARDEN FOR EVERYBODY

BY MR. C. N. BROWN, Madison.

(From Reporter's Transcript.)

I am not going to tell you very much about winter gardens. I am going to tell you about three things only, parsley, rhubarb and chicory.

I get a great deal of comfort out of parsley which I raise in the wintertime. You can raise parsley just as easily as you can raise geraniums. If you have a place where you can raise geraniums you can have a bed of parsley for your soup, or garnish, or for any other purpose you wish.

Late in the fall, after hard frosts, dig up your most thrifty parsley plants, dig up two of them, if you have place for them dig up three, but two of them will be quite sufficient. Take up as much dirt with the root as you can. The root is something like a carrot, only with a great many more rootlets. Cut off the tap root about six inches below the ground, get a good ball of earth, put it in a good-sized pot, cut off nine-tenths or more of the foliage, reduce it down so that you have only got a few leaves at the crown of the plant, give the pot a thorough watering, jar it down on the ground so that the earth which is around the roots will be well packed and compacted around the roots. After watering it thoroughly, set it away in the shade for two or three

days, then bring it into a sunny window, keep it well watered and you will have parsley all winter long. You will have parsley until the parsley which you grow from seed the coming season is far enough along to use. The only difficulty that you will have with any insect pest is the aphis, and that you can keep down by giving it a bath of soap suds every two weeks, or whenever the aphis seems to be getting the better of the plants. I have two pots of parsley and leaves enough on it for four families. If any of the neighbors want to borrow, they know where to come.

The next thing that I will tell you about is rhubarb. In the fall, after the frost has killed the foliage, dig up a good, big, thrifty rhubarb plant, put it in a barrel. Dig up a good bit of dirt with it, enough so that the bottom of the barrel will be pretty well filled, compact the earth around the roots, so that there will be no spaces around the roots to dry out. Put that barrel on your back steps, or in some place where it will freeze good and solid, and when it is well frozen, which may be probably not earlier than the middle of December—but be sure it is well frozen—take it into your cellar, put it into a warm place, water it thoroughly and await results. Keep it in the dark; put it in a dark closet or place where the light will not get to it, and in two or three weeks it will commence to make growth, and by the first of March you ought to have stalks a foot to two feet in length. There will be no particular leaves, but the stalks will be of a very delicate pink color and when cooked will give you the taste of fresh rhubarb. There is no difficulty about it. The only thing that you need to do is to be sure that your plant is well frozen before you bring it in, that you keep it in a dark place and that you keep it moist. You can cover it with sawdust or with sand. You do not get any other result from the sand or sawdust than to keep your earth moist, which is desirable.

Now for chicory. You grow the plants in the ordinary way in the garden, plant your seed in rows; thin your plants out to about 8 inches apart, and when the frost has killed the foliage, dig up the plants which will then be like parsnips; cut the roots off to an even length, about 8 to 10 inches, according to their size, but the thicker the roots, the longer they will be and the better the results will be. Put the roots in a barrel, with sand or earth, so that they will not dry out easily; wet the earth, wet the sand that the roots are packed in, cover them with 3 or 4 inches of sand or sawdust,

keep them moist, keep them in a warm place, keep them dark, and presently the tops will begin to grow and they will send out shoots, long big shoots from an inch to an inch and a half in diameter, and when these shoots are six inches or thereabouts high, cut them and use them for salad.

There is another way you can do and that is, instead of putting the roots in vertically, put them sideways, lay them down one above the other, so that the roots will be horizontal and the crown will project, and in that case the foliage, instead of going up in a kind of shoot, turns up towards the light, and you will get another variety of the same thing. Personally, I prefer the former method. All that you need to do is to be sure that your roots are well grown, that they are kept moist and kept in a warm place.

Personally, I do not care for chicory, because it is bitter, but a little of it, with head lettuce, makes a very agreeable salad.

DISCUSSION

MRS. KROENING: Do you use a whole barrel, or a barrel cut in half, for rhubarb?

MR. BROWN: A barrel cut in two is almost too short, because a big root of rhubarb will come well up to the middle of the ordinary barrel.

QUESTION: Does this chicory that you speak of live over the winter?

MR. BROWN: Yes.

QUESTION: It is classed among the noxious weeds by the state, is it not?

MR. BROWN: Yes. It is also classed among the desirable salad vegetables. You get quite a different plant when you have it in the garden, under garden conditions, than the small weeds scattered along roadsides.

INSECTS IN EVERYBODY'S GARDEN

CHARLES L. FLUKE, JR.

With but few exceptions we find the same insects in everybody's garden that we find in everybody's farm and orchard, and to treat all these pests as we would like to in order to make clear all control measures would make a manual altogether too lengthy

for the time at my disposal. The best I can do is to lay down some of the principles and generalizations of insect control.

If I were a gardener and knew little about the pests that might attack the various crops in my garden I should have to ask myself several questions regarding these insects if I would know what remedial measures to use.

One of the first questions I would consider is: Does the insect on my plants have biting and chewing mouth parts or has it a sucking type? For we know that poisons are applied to those that feed on the tissue of the plants and a contact spray must be used against the sucking forms. Again is the pest accessible or inaccessible; is it a leaf feeder, a stalk borer, a root inhabiting form, or does it feed within or on the fruit?

Most leaf feeders and a large part of the fruit infesting forms are accessible and may be killed by the application of a spray. Those forms which attack the roots or bore into the stocks or trunks must be handled in some other manner; and some are termed inaccessible since we know of no method to reach them.

We must also know the stage of the insect that is responsible for the damage to our crops; sometimes it is the larval form and in other cases it is both forms. Some insects can be killed only in the egg stage, large numbers are easily checked in their larval or immature stages, while others cannot be killed except in the adult stage.

Most everybody's garden contains the common vegetables such as cabbage, potatoes, onions, radishes, cucumbers, tomatoes, beans, peas and corn. If fruits are included we find perhaps some apple and cherry trees; small fruits such as raspberries, currants, and strawberries.

Now let me take just a minute or two to discuss only the most important pests of these crops in Wisconsin.

What gardener is not familiar with the cabbage worm, the larva of which comes from the white butterflies which flit over his garden most of the summer. This insect, however, need not be the troublesome pest that it is, since any arsenical spray such as lead arsenate or calcium arsenate used at the rate of 2 rounded teaspoonfuls to a gallon with the addition of soap as a spreader, will check its ravages and also without injury to the consumer. The cabbage maggot is held in check by the use of tarred felt

discs which are placed around the base of the plants when they are set out.

Most everyone has a few hills of potatoes in his garden which must be protected from the potato "bug" and the potato leaf hopper, especially in the southern part of our state. About 2 rounded tablespoonfuls of lead arsenate, or other poison in a gallon of water will easily get the potato beetle. Don't try knocking the bugs into a pan—it is a long and continuous fight with little success—spraying is much easier, cheaper, and more satisfactory.

I should say right here that every successful gardener should have, and to be successful he *does have,* a small sprayer of some type. The compressed air sprayers of about 3 gallon capacity are the best for the small gardener. If he has such a sprayer he can then for about 40 or 50 cents have an extension rod about 2½ feet long made that has a curved end which allows spraying the underside of the potato vines. This undershot spraying is necessary to control the potato leaf hopper. At the same time the spray is applied for the potato bug Bordeaux can be added to the spray and the leaf hopper checked. Don't do the work half way—make a thorough job of it, use plenty of spray. Bordeaux for the gardener is probably best secured by purchasing a small can of Bordeaux or copper of Bordeaux powder, following the directions given on the container.

If a few hills of cucumbers are also in the garden and the Bordeaux is also at hand cover the vines well with a lead arsenate-Bordeaux spray, the same as for the potatoes. Or the young plants can be covered with mosquito netting over a wire frame until the plants are of some size.

The maggots that blast young radishes are rather difficult to control. The best thing to do is to cover the bed with cheese cloth before the plants are up, and remove when the plants are almost ready for use. The sides of the bed of course must be boarded. This is successful only when the bed is in a sunny place and the cheese cloth is not too thick.

When beans are gathered in the fall they should be fumigated with carbon bisulphide by placing a small amount of the liquid in a saucer and putting on top of the beans, which should be in a tight box or jar and then covered over. Allow to remain for 48

hours. Remember carbon bisulphide gas, mixed with air, is highly explosive. Keep away from all lights, fires, and sparks. After fumigation put the beans into a tight container and place in a cold room or attic. This method will keep down to a minimum the weevils that so commonly make holes in the beans.

If you have flowers in your garden, apply the principles stated above, using nicotine sulphate (a tobacco decoction), about 1¼ teaspoonfuls to a gallon of water for plant lice such as the green fellows that so often ruin sweet peas before they have a chance to bloom. Dissolved soap should always be added to nicotine sulphate sprays, about an inch cube to every gallon of spray. This makes the material spread and kills the insects in greater numbers. If worms are chewing the leaves, use a spray of lead arsenate.

If you have currants and gooseberries in your garden, it will be necessary to protect them from the worms by spraying with lead arsenate, one rounded tablespoonful to a gallon of water. This isn't as strong as for potato bugs and cabbage worms since the currant worm is more easily killed.

There are many more insects that we might talk about, but I believe I have touched upon the most important. In conclusion let me summarize: Most chewing insects are killed by spraying with a poison such as lead arsenate. While it is impossible to give accurate measurements of material by volume we have found that if the poisons are used at the rate of 1 or 2 rounded tablespoonfuls to every gallon of water the best results will be secured.

Sucking insects, such as plant lice are killed with a contact spray; the best of which is nicotine sulphate, using 1¼ teaspoonfuls to every gallon of water and then adding enough soap to make the spray soapy. This amount depends upon the hardness or softness of water used; for soft water an inch cube of soap dissolved in hot water is sufficient for every gallon of the spray; for hard water, use more soap.

DISCUSSION

MR. FLUKE: In answer to that question, I rather doubt if it will lose its strength, especially if it is covered. If you doubt the strength of nicotine sulphate, take a spoon, dip it in the solution and then hold the spoon under the faucet, wash off until you cannot see any material on the spoon, and then just touch the tip of the spoon to your tongue, you will be surprised how strong that

material is. I do not believe it will deteriorate, but I cannot be positive.

MR. TOOLE: I should like to call attention to two insects which people find rather hard to combat. In many localities we see on the snow-ball the leaf curled up by insects. People do not know just what to do, and yet if you use this tobacco spray, then when the leaves are just opening, you can destroy the bugs which are causing the trouble. Do not wait until the leaves have been curled by the bugs, because then you can do nothing, but it is an easy matter if you attend to it in time. Then again we see roses looking fuzzy. Last spring I thought I would try tobacco, but it did not seem to do the work, then I used arsenate of lead, and from this time on I will be a little more prompt about using the arsenate. If you watch closely just before the roses begin to bloom, you will see little worms there, slugs, if you are prompt you can very easily overcome them.

MR. FLUKE: The rose slug ought to be checked with the nicotine sulphate spray, provided you add a little soap, but you have got to hit the insect to kill it. The beauty of the arsenical spray is that you can put it on and the worm comes along and eats it and dies. In regard to the snowball, we found that in order to get the lice we must get them in the early stages. Do not wait till the leaves curl. Nicotine sulphate is all right if used at the right time.

Wednesday Morning Session

THE PRESIDENT: I have two committees to announce. First is the committee to revise the list on ornamentals. I have appointed W. J. Moyle, Professor Aust and William Toole, Sr.

Committee to revise premium list at the state fair: N. A. Rasmussen, J. W. Moore and M. B. Goff.

PRESIDENT'S ADDRESS

J. A. HAYS.

As we come together in annual convention for the 54th time, like Lot we cannot help but look back and as we look we see some of the things which our predecessors have had to contend with. Not only the common enemies of horticulture had to be met and overcome, but the founders of this Society were in such a pitiful minority that their main task was to convince their neighbors that fruit could be grown in this far northern state of ours.

By coming together year after year they were able to maintain their faith and make new converts until a few years ago their circle of influence became so large that the great State of Wisconsin became convinced that the industry was worth fostering and came to the aid of the Society with funds to enable them to test the possibilities of the different sections of the state in this line of endeavor. We are all familiar with the success of these experiments. While we are not able to maintain a position in the front ranks of Wisconsin industries like the dairymen and potato growers, we are making some strides and are already producing annually within the borders of our state fruit worth more than seven million dollars for tree fruits alone.

While this is a small amount compared with the revenue from some other industries, when we consider the youth of our industry and the fact that we have only started in a commercial way, it seems like a large sum. Especially when we take into account the small sum it has taken to build up the industry to its present position.

Only a few years ago one of the leading men in the agricultural department of our Wisconsin University scouted the idea of fruit growing in our state. Today this department is our best friend and ally and is working in a scientific way to solve some of our more difficult problems and make ours a safer and more profitable business.

I can think of no influence except that exerted by our Society and its auxiliaries which has brought about this change in sentiment. And today our Society has upon its hands the responsibility of keeping up the propaganda that has wrought this change, but it must use every device at its command to bring together the horticultural interests of our state, not only in our annual convention, but in a spirit of fellowship that will lead to a mutual understanding of the more difficult questions which confront us. While an exhibition of our products is and should be a part of every gathering of our people, there should also be an exhibition of that spirit of helpfulness, which not only renews and inspires faith in our vocation, but also serves to impress the public with our devotion to our chosen work.

These impressions on the public are responsible for many converts to our ranks in the past and must be relied upon for such addition to our ranks in the future as are necessary to bring our industry up to its proper place among agricultural pursuits.

According to the Government Bureau of Crop Estimates, our great state of Wisconsin is credited with about one-half million bushels of commercial apples for the year 1920. This means one bushel for each family of five people, provided none of these apples leave the state. This one example should enable us to realize that some other state or states are getting an immense sum of money from us, for this one item of apples alone. We should

not be content to say, we are trading potatoes or butter and cheese for our apples, but instead should encourage in every way the development of the almost untouched horticultural resources of our state.

We must also pause in our commercialism and consider the interests of the amateur. This is not only a very important division of horticulture, but it is from the ranks of the amateur that we get our recruits for the army of commercial growers.

In common with other industries we have had and are still receiving much valuable support from the state, and our labors in the past have amply justified this support; but we must not rest, we will labor on until the products of our chosen branch of agriculture shall reach a prominent place among the industries of our state. The field of useful endeavor for our Society is now larger than at any former period in its history. The subject of rural planning has had some attention from our Society, but is worthy of much more attention than we have been able to give it. I trust that we may renew our efforts in this direction and continue the work until we can point to a few living examples as a result of our influence.

While there are no available statistics regarding the amount of fruit consumed within our state, we do know that this consumption might be increased many fold at great advantage to our people, if its real value as food was a matter of common knowledge. The dissemination of this knowledge by our Society would serve to benefit not only the producer but the consumer.

ANNUAL REPORT OF SECRETARY

FREDERIC CRANEFIELD

The year just behind us has been a satisfactory one to all concerned with horticulture, whether amateur or professional. So far as the commercial grower is concerned, a good season, good crops and good prices, a combination rarely experienced, should give encouragement and satisfaction.

It is probably true that the period embracing the years 1915-1920 was the most satisfactory ever experienced by Wisconsin gardeners and fruit growers so far as crops and prices were concerned. If, then, it happens that we are to face a period of lower prices and weaker markets we should meet it with fortitude and as near as may be possible without complaint.

The back yard garden movement, which received such a stimulus in 1917 and 1918, has not seriously affected the market gardeners. In fact, I am of the opinion that a close examination of the situation would show that it has helped them.

The city gardner, whether a man of limited means or the man who gardens for fun, has learned valuable lessons, one of which is an increased respect for the man who is compelled to make his living by raising fruits and vegetables. The city gardener is not now so sure as he was before he begun the gardening game, that the commercial gardener is a profiteer, a gouger, a robber. He has seen a "great light". There need be no fear on the part of the market gardener that his business will suffer severely in the long run from city gardens. These gardens are the best possible advertising medium for his products. Our work, then, in the encouragement of city gardens must not be abandoned. We must, by word and deed, encourage those who are now interested and also maintain our recruiting stations.

We find a new field for our endeavors in the home or city garden work in the encouragement of the planting and care of fruit trees. We attacked the vegetable and small fruit problem in these gardens as the line of least resistance and have overlooked the fact that most city back lots afford room for at least two apple trees, one Duchess and one Northwestern. Why not? It will not more seriously interfere with the fruit grower than the back yard garden does to the market gardener; merely create an appetite for more fruit.

Along with this urge must come, from us, some potential plan for the alleviation of apple scab and codling moth on these city bred trees. There is now scarcely a city in the state but has within its limits hundreds of bearing fruit trees (there are in Madison not less than 2000 such trees), not one per cent of which are pruned or sprayed. There is a great opportunity here for someone to practice the gospel of spraying.

The school garden work also deserves our attention. Just now it is too much like the greater part of our school system, machine made. The greatest need in this work is to find teachers who possess imagination, then the youngster who really wants a garden of his own may be able to find it in the school garden plot without referring to the numbered stake. He will be permitted to give expression to his ideas of what a garden ought to be and if it occasionally includes a weed or two no harm will be done. (The average school garden plot offends my sight by its rigid formality and sameness. If it were not a hateful expression I should say it appears like something "Made in Germany".)

A problem of the first magnitude, which was outlined a year ago in the President's address and the report of the Secretary, seems no nearer solution now than then, the almost complete extinction of cane fruit growing in the state. This is a problem affecting everyone in Wisconsin, whether producer or consumer. Preaching apparently has had but little effect, so the Executive Committee of this Society at its session last evening adopted a plan which should give results. This plan, briefly stated, is modeled on our trial orchard work, but a much more comprehensive plan com-

prising thirty and possibly three hundred demonstration stations, this work to be carried on through co-operation with the county agents.

Another problem, not new and one that will be discussed at length during this meeting, is the Farm Orchard. We have had wise counsel on this subject in the past and will have wiser counsel and material aid in the future. The average small farm or home orchard as it exists today is one of the worst drawbacks to successful commercial fruit growing we have in the state. It's worse than a liability, it's a curse. Let's solve this problem without further delay. If we can do it we will have done our share toward keeping our Society and our state in the front rank of progressive institutions.

The marketing of Wisconsin-grown apples has seemed a big problem in the past, but is one that is growing smaller and smaller as the years go by, or rather as the quality of our product improves. When we have entirely eliminated the "barnyard apples" from back of the barnyards of Wisconsin and apples intended for the trade are grown only by well-trained and experienced fruit growers, we will have gone a long way toward the solution of our problem. There will still remain the big factor of marketing. This is too big a subject to discuss in a report of this nature, but it may be said in passing that, "the old order passeth". Wide-awake fruit growers, acting independently and through co-operative shipping associations, have wiped out the commission and consignment corruptions and compelled the wholesale buyers to become merchants in fact rather than gamblers and in many cases petty thieves. A further readjustment is just in sight and it behooves the grower to keep in close touch with events. Co-operation is going to mean more than a mere claptrap word in the future.

The further development of commercial orchards in Wisconsin is work in which this Society should not be "weary of well doing". We have done much, but have really only made a good beginning. Door county could double its acreage of tree fruits and handle the output easily. The scant 800 acres in the Kickapoo region could be increased to 10,000 acres and still only scratch the surface. There is abundant room for thousands of acres more of apple and cherry orchards in Wisconsin and there is every reason why the trees should be planted. In spite of the vast plantings both in the East and West there is little doubt that a careful census of bearing trees in the United States would show a tremendous decrease each year. Somebody must take up the slack, why not progressive Wisconsin horticulturists aided by our Society?

More than twenty years ago I took the stand that Wisconsin orchards should consist almost wholly of fall maturing varieties, Duchess, Dudley, Wealthy, Fameuse and McIntosh the leaders. Each succeeding year's observations since that time has only

served to strengthen my opinion in that respect and the season just passed served to clinch it. Thousands of barrels of winter apples are now lying under the snowbanks in New York and Michigan and those sold brought the grower from 25c to $1.00 a bushel. Long before these apples ripened Wisconsin growers had sold their fall apples for $6, $8 and $10 a barrel.

In this proposed development of fruit growing there are two distinct lines of procedure open to us; first to promote the development of large commercial orchards, urging the extension of these already planted and opening new districts; secondly, encouragement to the smaller grower. There are splendid opportunities near cities of two thousand population or more for enterprising growers to plant orchards of five to ten acres to supply local markets. When we have accomplished the planting and organized the co-operative marketing, not alone in the different communities but a state-wide organization, it still remains for the growers to get in touch with similar organizations in other states. Until recently fruit growing was the only major branch of agriculture that had no national organization. There is now, however, a new light on the horizon. The American Pomological Society, having seventy-five years of honorable history back of it, has been reorganized so as to include commercial fruit growing in its activities. You will I am sure be satisfied if not pleased to know that representatives of this Society authorized by your executive committee have had a prominent part in shaping the policies of this new organization which promises much good for the fruit growing industry.

Rural Planning is not dead, only drowsing, and will wake up soon. This great work, or work that may be made great, is in the hands of the Rural Planning Commission, with whom we have offered to co-operate. Let us join hands with every department in promoting this work.

I have mentioned only a few of the things we ought to do. There are so many others that a mere recital would take many pages. I have enumerated only those which are so near to us that we cannot avoid seeing them. A broader policy, one looking ahead fifty or one hundred years, would fill a volume.

Your Secretary realizes that this report might have been more consistent had it begun with a record of accomplishments during the past year rather than suggestions for the future, but that which has been done is merely history, that which remains to be done concerns us most.

Your officers and executive committee have aimed to execute to the best of their abilities the work before them.

The Trial Orchard work is declining in extent owing to the fact that the contracts under which the orchards were held are maturing and no new ones have been executed. It has been the policy of the committees in charge of this work that it be allowed

to expire by limitation and that the Society expend its efforts in new fields. If in so doing we accomplish one-tenth as much good as we have in promoting fruit growing through the trial orchards we may be well satisfied. A discussion of the orchards will be offered by the Trial Orchard Committee.

The publications of the Society during the year were practically the same as those of the preceding year. Wisconsin Horticulture, including two supplements; January, Proceedings of American Pomological Society; and April, Control of Insects and Diseases; the Annual Report, and several leaflets. It has been the policy of your Secretary as Editor of the Report to include in it only matter of permanent value and to secure such a careful revision of the fruit and flower tree and plant lists that it might serve as a reliable guide to prospective planters as well as an all year reference book.

We have worked in close cooperation with the departments of horticulture, plant pathology and entomology, as well as with the various branches of the State Department of Agriculture. Our connection with the Wisconsin State Beekeepers Association has been strengthened during the year and the pleasant relations established will undoubtedly continue. Beginning with January of this year the Beekeepers Auxiliary will add nearly 800 names to our mailing list, each one of which will some day be converted to horticulture. While there may be many readers of Horticulture who do not read the four pages devoted each month to beekeeping, they must keep in mind that the addition of these pages has not reduced the number of pages of horticultural reading matter. We have aided the State Fair Board in such ways as we could and maintain cordial relations with them.

We have spent all the money allotted us by the state and every other dollar that came into our possession, going on the theory that the money was appropriated to be spent. We hope it has been wisely spent.

But one new local Society has been organized during the year, the La Crosse County Society.

An account of the work of the established local Societies during the year has been placed in file and will be published in connection with this report.

On motion of Mr. Toole, the Secretary's report was adopted.

INSPECTION OF TRIAL ORCHARDS, AUGUST, 1920

W. J. MOYLE, Union Grove.

Report of Committee consisting of President Hays, L. G. Kellogg, N. A. Rasmussen, W. A. Toole and the writer.

The experimental trip overland by auto in the summer of 1919 proved so satisfactory that it was decided to inspect the orchards by the same method again this year.

July 31 found us speeding on our way from Milwaukee to Manitowoc, at which place the Society has seen fit to set out a commercial orchard, varieties consisting mostly of Wealthy, N. W. Greening and Fameuse.

From a climate standpoint this orchard is very favorably located near Lake Michigan and at this time is of producing age. Here the Wealthy and N. W. Greening were showing a fine crop of apples, but on account of the dry season much of the fruit was under size and more or less affected with scab. This disease is quite prevalent in all the orchards along the lake shore and requires constant care and attention in spraying to keep it under control. The management of this orchard is in excellent hands and provisions have been made during the past season whereby an up-to-date power sprayer and other orchard tools will be used in taking care of the trees and fruit and we shall expect to see a 100 per cent perfect crop of apples in this orchard next year. Very little blight was found in this orchard and most of the trees were thrifty and healthy.

August 2 found us in Douglas county on the Lake Superior shore looking over the orchard at Maple. Here a year ago a hail storm had knocked off the apples and terribly mutilated the trees, and much to our surprise we found the trees had entirely recovered from the effects of the storm and were also producing a wonderful crop of apples. In this orchard we found some of the finest Duchess, Hibernal and Patten's of anywhere on our trip. The orchard showed excellent care and cultivation and at the time of our visit was growing a fine cover crop of buckwheat.

The Poplar orchard is situated on lower ground a few miles west of Maple in the same county. This orchard has been planted long enough to thoroughly try out the possibilities of growing apples on the Lake Superior shore. Here we saw as fine a crop of Duchess maturing on the trees as any one could wish for, the writer estimating the crop at a thousand bushels.

Douglas county can grow Duchess commercially and make it pay, was the decision of the committee. The Wealthy trees in this orchard did not seem to be quite hardy enough for this latitude and were slowly succumbing to the rigorous conditions of climate and soil that they have to contend with here.

Many of the native plums were fruiting this season, but this fruit has proven very unsatisfactory and is not recommended for this location.

August 3 found us one hundred miles further south in Chippewa county inspecting the Holcombe orchard. Much improvement was noted here since our last trip. The young trees had made a fine growth but blight had struck them and Wealthy and Windsor were badly affected, while Duchess and Dudley were comparatively free. In this orchard McIntosh, Fameuse and Tolman were just holding their own. The orchard was in an excellent state of cultivation with a cover crop of buckwheat doing nicely.

In an old orchard at this locality we found five or six trees of Duchess and Tetofsky of 25 or more years standing, loaded down with the most delicious and beautiful specimens of fruit we ever saw, practically free from blight, insect, pest or fungus. These trees had had no particular care or attention and were the sole survivors of a settler's orchard of 25 or more trees growing in a big yard.

August 4 we motored over to Weston in Dunn county. Here on our visit the previous summer we had pronounced this young orchard the most promising in the state. A rich soil with an ideal growing season and good cultivation had produced a luxurious growth. Then the fire blight came and the Weston orchard was certainly laid low. All varieties seemed to be doing fine until struck with the blight. Delicious and McIntosh seemed to stand it the best, while Wealthy, McMahon and Fameuse went down together as before the reaper's sickle. Prompt and vigor-

ous methods will have to be applied early next season to prevent a bad stage of canker which will be liable to follow this blight and destroy the trees.

At Whitehall in Trempealeau county, fifty miles further south, is located one of the finest trial orchards that was ever set out by the State Society. This orchard is certainly a wonderful sight as it is beautifully located on an ideal orchard slope. Here long rows of McMahon, Okabena, Hibernal, Wealthy, Duchess and Longfield vie with each other in producing bountiful crops. This orchard has been growing in sod for several years, for which the Society can congratulate itself at this time, as the retarded growth caused by this method of cultivation has been the means of this beautiful orchard escaping the devastating effects of the fire blight that has caused so much ruin all up and down the western side of the state the past summer. Here again the Duchess takes the lead with a wonderful crop and all the other varieties were well loaded, with practically no blight.

From Whitehall we drove to Gays Mills, Crawford county, unquestionably one of the best apple growing counties in the state. However, blight had struck the orchards here also. McIntosh seemed to be particularly adapted to this locality, here they grow perfect, as do the N. W. Greenings when proper care and attention is given to them.

The trial orchard here gets excellent care and is an every day practical demonstration of what can be done in Crawford county.

At Baraboo in Sauk county, the trial orchard is located on the grounds of A. K. Bassett. This is a small orchard set out principally to test a lot of the newer varieties. The trees are just beginning to fruit at this time, no later data of practical value is as yet available. Considerable blight was in evidence here, however another season no doubt will see this under control. This orchard is in good hands and in time will be a valuable object lesson to the state.

From Baraboo we ran down to Lake Geneva in Walworth county, on the southern boundary of the state. This trial orchard is quite an extensive planting of apples and cherries and was set out and intended to be a strictly commercial proposition. So far, however, this orchard has failed to produce the goods.

This is due largely, the committee decided, to malnutrition or soil conditions and insect and fungus enemies.

The orchard committee suggest that the Society take steps at once to have a professional horticultural doctor make a complete diagnosis of the conditions of this orchard and every effort possible be made to put it on a paying basis, as it no doubt can be done.

The Pewaukee orchard, the last stop on our return trip, is located in Waukesha county and is of more recent planting and composed largely of the less known and newer varieties. These trees are just arriving at a bearing age and from now on should prove a very interesting and valuable study as well as a guide to future planting in that locality. Good care has been given this orchard and the trees are thrifty and healthy.

THE POPLAR TRIAL ORCHARD AND MY IMPRESSIONS OF FRUIT GROWING IN DOUGLAS COUNTY

By P. A. PETERSON, Superintendent of Poplar Trial Orchard.

The Poplar Trial Orchard has been, intermittently at least, the subject of much discussion and controversy ever since it was planted until the present time and for the last two or three years a place that the land men "point to with pride" to their prospective buyers of farm lands. This pointing, our Secretary and I have "viewed with alarm," as the very good yields of the past two years might readily mislead anyone not acquainted with all the facts to believe that this region is favorable for commercial fruit growing and invest in land with that in view.

Permit me to give a brief history of the Poplar Orchard: The first block of five acres was planted in 1904 and about the same amount in 1905, but a year or two later it was reduced to eight acres, its present size, and a three-acre trial orchard started at Maple.

About thirty varieties of apples and crabs were set out, five or six of native plums, and three or four of cherries.

The soil is what is known as Superior red clay. Drainage was one of the first problems that had to be dealt with, as in rainy seasons we could not get on the land for weeks at a time.

This was effectively remedied in 1908 by laying over 9,000 feet of tile. Tiling, on our heavy and seemingly impervious clay, was something of an experiment and we had our doubts about the water ever getting down to the tile after the trenches were filled in and the earth settled, but it worked from the start and is still working satisfactorily.

Another great trouble that we had before tiling was that the warm rains in September would start a new wood growth, which did not mature before cold weather set in and, therefore, would freeze back each winter.

The orchard, except a triangular piece of about half an acre that is cut off by a small watercourse, making it rather unhandy to cultivate, has been cultivated every year, so this was seeded down in 1907 and has been in sod ever since. It has proved to be quite an object lesson, as the trees on that plot, although manured several times and the grass left to rot down for many years, the trees are less than half as large as where cultivated and the fruit crop has been very light and of small size.

During the last three or four years we have put some manure on the orchard and the results have been apparent by a more rapid wood growth and healthier looking foliage. I believe that the good yields in 1919 and 1920 were largely a result of this manuring.

I would like to stop here, but if I am to tell the truth and the whole truth, I must continue and tell the rest of the story.

Right from the beginning most of the trees showed a slow growth and commenced to "black heart." In a couple of years after planting we had only six or seven varieties of apples left; most of the plums and only two or three cherry trees. Of the varieties of apples now growing, there is only one that appears entirely hardy and that is Hibernal. The others come in about the following order: Duchess, Dudley, Patten Greening, Longfield, (too small to have any commercial value), Wealthy and McMahan. I would also like to include as being fairly hardy Yellow Transparent. These have not been tried out in the Poplar orchard, but there are some in the Maple orchard and I planted some about twenty years ago. They seem fully as hardy as Duchess and so far have been free from blight. Of the McMahan only a few trees remain, but these seem to do fairly well. The Wealthys commenced to show signs of canker blight and decay

several years ago and those of the original plantings are about "all in."

The Duchess and Patten Greening, of which varieties we have the most trees, are also showing disease and are gradually dying out, so, if this orchard is to be maintained, it will be necessary in the future, as in the past, to replant many trees each year.

The Hyslop and Transcendent crabs are doing well. The Transcendents, especially, have made a remarkable growth, but have only produced two crops of any consequence so far. The Hyslop trees are smaller, but bear more regularly.

The plums have done fairly well and for a time it looked as if they might prove profitable, but late spring frosts or early fall frosts have caught them several times, so only four crops have been marketed in 16 years.

The Surprise, Wyant and DeSoto are the most dependable, in order named, with the taboo on Rockford.

Last August I visited orchards at Oshkosh, Baraboo and Gays Mills and, comparing them with our trial orchard at Poplar, I found that the trees had a healthier and smoother bark and that trees ten to twelve years old were as large as ours at sixteen, and came into bearing at an earlier age.

There are scores of small farm orchards in Douglas county containing from a dozen trees to one acre and probably a dozen orchards of from two to ten acres; not more than one or two of the latter over ten years old, but as these orchards, with possibly one exception, have been indifferently cared for or neglected entirely, they are of little value in determining the possibilities of fruit raising, but based entirely on results obtained in the Poplar and Maple trial orchards, I am fully convinced that fruit growing, except the small fruits, cannot become profitable from a commercial standpoint. First, because trees are late coming into bearing and are short lived—Hibernals excepted. Second, because, being restricted to a few of the early varieties, there is only market for a limited quantity at the head of the lakes, since we come in competition with southern Wisconsin and Iowa Wealthys and our Duchess, and Wealthys come on just about the time that early winter varieties come in from Michigan and elsewhere.

However, I firmly believe that any farmer in our county, except on some of the light sandy soils, can have a nice little home or-

chard of twenty or thirty trees if he will plant the proven hardy kinds and plant them properly, prune, cultivate, fertilize, and, when they come into bearing, spray. This is all necessary for best results, but I want to place special emphasis on cultivation.

Had this been the Dairy instead of Horticultural Convention, I would like to have told you of the wonderful clover crops we raise up there and the great opportunities for dairying, but you have probably heard all about that before and, besides, I have taken up enough of your time.

THE MANITOWOC TRIAL ORCHARD

OTTO DREWS, Superintendent.

(From Reporter's Transcript.)

I was called upon by the Secretary to appear before your Society and give a report on the condition of our orchard, as it appears to me, and upon another question that was in my mind, as to whether it would prove profitable for any young man to go into the business of producing apples in our section of the country at this time.

Personally, I do not feel as though I ought to come before an intelligent audience like this, who are posted in horticulture, because I am only a novice in that line. Although I have taken an interest in horticultural work for years, I have never had an opportunity to practice it until I came to the place where I am now and we happened to have there the trial orchard. When I first saw the orchard, I formed a very poor impression of it, because it is, in the first place, poorly located. The soil is heavy and flat. We get those heavy rains down there in the springtime and the water seems to remain in the soil such length of time that we are often unable to do what we ought to do for the good of the orchard. It is very seldom during the seven years that I have been there that we have been able to give the orchard all the sprayings that it ought to have had. Last year we were fortunate, in a way. We were able to give it three sprays, but we were compelled to omit the first one and the most important one, the pink bud spray. We were absolutely unable to drive a team of horses in that orchard, so we could not do it, but we got the other three sprays on and the apples showed up in pretty fair shape.

The trees have made rapid growth, especially the Macmahons and the Northwestern Greenings. They were planted 24 feet apart, and they are now within 6 feet of each other, and they have grown rather high. The Wealthys have not grown quite as rapidly.

Another thing I should like to say about the orchard, to express my opinion, I do not know how the other members of the committee feel about it, and that is, there are two varieties of apples in that orchard that do not suit me at all. One variety the committee is not to blame for, because they bought the right kind, but did not get it and I do not know what the variety is that we did get and I do not believe they do either, but the kind I do not believe is a proper apple for that section is the MacMahon. I tried very hard last year to see what I could do with the MacMahon up there. I gave them a double dose of spray, and I found that only about 40 per cent of the MacMahons were fit to use, the other 60 per cent were practically worthless and covered with scab.

Now, the other varieties there, the Wealthys, the Northwestern Greenings and Fameuse, do not get that way; we treat them right and they will show up and produce. We have had a wonderful crop in the orchard this year. We have a 5-acre plot there, planted 12 years ago, and we had about 1,500 bushels there this year, and not all the trees bearing. I should judge that about two-thirds of the trees were bearing this last year. We have had some beautiful apples to look at. Persons driving by the orchard could not help but take notice. People from Milwaukee, Chicago, Kewaunee, Door county, drove by there on Route 17, and often inquired of the neighbors who owned that orchard, and they would ask permission to come in and look at it. This orchard has done a great deal to induce many of the more progressive farmers in the community to find out what we did with those trees, in order that they look so healthy, or so well pruned and have so little trouble with the worms. I have all kinds of questions to answer.

In regard to spraying, people come there continually, asking for information. I know that there are four or five who are going into the apple business there that have had large orchards before and have never taken care of them. They are now producing as fine apples in their orchards as you can buy anywhere from Michigan or New York.

Now, I should like to say a few words of what I think about the chances of a young man starting in the apple business in our section of the country. If I were a young man, I would not hesitate to do so. I find, however, that in order to make a success of the business, if we intend to depend upon our local market, we would have to go into the business of raising apples that mature in the latter part of the autumn, and we would have to have storage room to keep those apples until the market calls for what we have for sale. I do not believe that we could make it profitable up there to raise an early variety. You see, our farming communities have many of those varieties, and they dump them on the market, and our market is full of an inferior grade of apples. Our businessmen must take them, they cannot turn them away. There is an inferior apple on the market that spoils the market for the good ones, and I believe if we produce apples that are later and have the room to store them and keep them up to this time of the year (December or January), that we can demand a price greater than they can get them for from the eastern states.

I know there is a demand, because I have stored away about 250 bushels of Greenings and we have them in a refrigerator, and I could sell them any day I would want to sell them now for $2.00 a bushel, without expense of delivery. We did not sell a barrel of apples to any dealer in the town, all the apples that we had for sale were taken right off the place. We graded them into three grades and we sold them for $1.50 or $1.75 a bushel. (1920.)

Now, if any young man wanted to start in that country, he would make just as big a success of the apple industry as they can out in the west or in the east, but I believe one thing he would have to have is a good storage cellar. I am going to try it if I stay long enough in that place. I am going to build a storage cellar, and I intend to make it a real storage cellar, and I do not believe the commissioners will kick on the price. I intend to build a cellar large enough to hold 2,000 to 3,000 bushels of apples, and I am going to ceil the walls of the cellar so that we can run our pipes in there from the ice machine and keep it cold in the early fall, and I believe in that way we can hold our apples until February and March and get a good price.

OFF-YEAR APPLE BEARING

By PROF. R. H. ROBERTS, College of Agriculture.

Ladies and Gentlemen: We will begin with the proposition that off-year bearing is due to nutritional conditions of the trees. Now, many of you, as I know your orchards, doubtless think that we are overstating the matter, for certainly the regularity with which your trees have an off-year, might give you cause to think that an off-year is not due to the lack of feeding, but is due more to hereditary characters. I ask, however, that you bear with me while I present some of the evidence which we have collected that has caused us to arrive at the above conclusion.

We want to consider the question of blossom bud formation and not very much about fruiting, although the latter is the thing that you are certainly interested in from the economic standpoint. As bud formation or fruitfulness has been shown pretty clearly to be dependent upon the composition of the wood of the trees, I want to consider this in considerable detail, in order to make our position in the matter clear. If you are familiar with the work of Kraus and Kraybill, which is given in Oregon Experiment Station Bulletin 149, you will already have in mind much of what we want to say of the relation between growth and fruiting. If you are not familiar with it, and you grow any trees whatsoever, you had better get that bulletin. The idea that these workers present in explanation of fruitfulness in plants, working with the tomato, is a most important matter in helping the grower to understand how his trees are growing, and to help him in deciding upon needed cultural practices.

Stated briefly, the proposition which they put forth is something like this. A plant has two kinds of food. One of these it manufactures by its leaves from materials obtained from the air, and soil moisture. An example of this type of food is the sugar such as we get out of the sugar maple. We call this class of materials carbohydrates. The other type of material obtained by the plant is from the soil, as salts of nitrogen and phosphorus. Kraus and Kraybill found that with tomatoes there are two kinds of unfruitful plants, either the one which is over-vegetative, or

the one which is under-vegetative. They find the former is extremely high in nitrogen, and low in carbohydrates. The other unfruitful plant is very poor in vegetation, is generally high in carbohydrates, and, as a rule, low in nitrogen. In addition to these two conditions, they had plants which were fruitful. These were plants which have conditions balanced, so to speak, between the carbohydrates and nitrogen products.

In explanation of how this situation seems to fit apple trees we can call to mind several conditions with which you are already familiar. For example, the young tree before it comes into fruit is making a very strong vegetative growth and is unfruitful. Analyses show such trees have a high nitrogen content and a low carbohydrate content. We have found from analysis that a rather high carbohydrate content is necessary for blossom bud formation. That is why we are putting so much emphasis on the proposition of wood content. Blossom bud formation depends upon the composition of the plant, and plants that are unfruitful may be either very low in nitrogen or very high in nitrogen. We want to get that clearly in mind, because it has an important bearing upon the treatment and cultural practice which the orchard needs.

The tree which is girdled becomes very fruitful. This is due to a constricting of the transporting tissue of the plants to such an extent that the carbohydrates accumulate above the girdle and conditions for blossom bud formation are created. Even the sick tree does not form blossom buds because it is trying to reproduce its kind; it forms blossom buds because it cannot help it, through the trunk or roots being injured to such an extent that there is a natural accumulation of carbohydrate products in the top, and this condition gives blossom bud formation.

As growers, you are probably not much interested in the internal composition of the plant. There are, however, some very good external measurements by which we can judge the condition of plants, as twig length, spur length, leaf size, leaf color, color of bark, etc. The one which we want to pay special attention to now is growth length, especially spur growth length. We want to discuss in detail some of the things which spurs do. We will begin by saying that some spurs are fruitful, as you know, and some are not. There is nothing new about that, but we have found that some of the unfruitful spurs are unfruitful because

they are very vegetative, while others are unfruitful because they are undervegetative. It is well to know which kind of unfruitful spurs we have in our trees if we are going to make the best decision as to the cultural practice needed.

We find this condition of spurs especially with the Wealthy. If the spur makes a growth of about one-eighth inch or less it forms, typically, a leaf bud; if the growth is somewhat greater than one-eighth inch, up towards a quarter inch, it will form, typically, a blossom bud, but such spurs seldom set fruits. If the growth is somewhat longer, as a half to three-quarters of an inch, such a spur will form a blossom bud. It is such spurs which produce fruit on the trees. If the spur is longer, as an inch or more, very many of this type of spurs have terminal leaf buds. So we say that blossom bud formation is related to the nutritional conditions, as shown by the length of the growth of the spurs.

Now, the question comes, what relation has this to off-year bearing. It occurs in this way: We find that with Wealthy, for example, in the off-year ninety per cent or more of the spurs grow to be of average lengths and they practically all blossom the next year. Now, what happens to these spurs when they blossom? They produce four, five or six blossoms and a secondary wood growth at the same time. That is, the apple blossom bud produces both blossoms and wood growth. We find by measuring this new secondary growth that ninety per cent or more of them are of the undervegetation class, so there is in off-year trees a fluctuation from all spurs forming blossom buds one year to none the next. So we propose that off-year bearing is related to nutritional conditions of the trees.

The reason that only short growths form on the spur the year it is blossoming is doubtless due to the drain upon the reserve food in the tree for the production of blossoms. The early growth is apparently made very largely from the reserves that are in the tree.

Now, what is the situation in trees which are regular in bearing? There are four very distinct differences in the spur growth, spur habits, if you please, between off-year trees and regular bearing trees. There are two that are very important, and there are two that are not so important, as we see the situation now. Probably the most important difference in many

cases between off-year trees and regular bearing trees is the difference in the formation of blossom buds on second-year wood. The off-year tree as we find it about the state makes a short terminal growth, rarely over five or six inches. Generally one or two small spurs form on the second-year wood of the off-year tree. On the other hand, regular bearing trees make a terminal growth of ten, twelve, or fifteen inches. They form a number of spurs along this growth the next season and these spurs are generally more vegetative than those of the off-year trees and many of them are fruiting spurs, so that the regular bearing tree is regular in bearing very largely because blossom buds form on spurs of second-year wood each season. The new spurs of off-year trees do not form blossom buds unless the whole tree is coming into bearing. The spurs of regular bearing trees form blossom buds irrespective of whether the tree is fruiting or not, and that is one of the most important differences between regular bearing and biennially bearing trees.

When you get a vegetative condition in the trees, that gives one of these situations, usually you get all four of them coming together.

The second big difference is, instead of some to many spurs remaining undervegetative and unfruitful year after year, they make enough growth during a fruiting year to form blossom buds while other spurs are fruiting. This gives regular bearing through different spurs fruiting in different years.

The third difference is that some spurs blossom in successive seasons. This does not have a very great bearing, however, on regular fruitfulness, because it is unusual for a spur to produce fruits in successive years. It is generally the spur which drops its blossoms early in the season which produces a blossom bud again that year.

A fourth difference between regular bearing and off-bearing trees is that there is some terminal fruiting on the regular bearing tree, and quite a little bit of lateral blossom bud formation. That is, blossom bud formation on the current season's growth. So we propose that blossom bud formation on off-year bearing and regular bearing trees is related to growth conditions in apple trees.

Now the question comes up, if we attempt to produce regular bearing in the orchard, what to do from the cultural, fertilizer and

pruning end—and I want to emphasize pruning especially. When starting out to modify the growth in the orchards, measure the results by the growth made by the trees. Find out whether or not sufficient terminal growth is made so that the second-year wood forms blossom buds on it. Find out, if there are any great number of spurs about the trees that do not form blossom buds. If so, find out whether they are in the undervegetative class, or in the overvegetative class. Usually the thing that we have to deal with under most situations is to make the trees more vegetative.

So we come to a consideration of fertilizers, and one thing that we are especially interested in is nitrogen fertilizer. This is for two reasons. In the first place, under very few situations are the other elements so limited in the soil that they materially reduce the growth of the trees. Too little nitrogen certainly does limit growth. In the second place, the spur growth on trees is made very early in the season. The spurs that form blossom buds complete their growth in length about the time the tree comes to full blossom. That means, in most parts of the state about the 10th or 15th of May. We find that there is practically no nitrogen measurable in the soil at that time of the year, a thing that we want to get clearly in mind in relation to fertilizer treatment.

In order to enable the trees to make the kind of growth we want, make an application of a readily available nitrogen fertilizer early in the season, three or four weeks before the trees can be expected to blossom in your respective localities.

It seems advisable in many of our locations here in the state to use a clover sod with a quickly available nitrogen fertilizer. This will give growth, good initial size to the fruit, and better colored fruit. There is considerable evidence accumulating, that the difference in growth secured between sod and cultivated orchards is not one of moisture conditions; it is the difference in the nitrogen that is available for the tree in the cultivated soil.

DISCUSSION.

QUESTION: What was that last statement?

PROF. ROBERTS: Apparently the difference between cultivation and sod in the orchard may be its effects on nitrification in the soil, and not upon big differences in the moisture content. There is considerable evidence to show that we can get the

growth conditions that we need in our trees from the use of nitrogen even in our sod orchards. This is the thing that I want to bring to your attention,—base your cultural practices upon the growth that you get and not upon any fixed cultural recommendations.

I should want the terminal growth to be 10 to 15 inches in length. Now, of course, the length of growth is not what determines whether or not it forms blossom buds; it happens that spurs of average lengths have a composition that gives blossom buds, This is probably because of the number and size of leaves that there are along the spur which can manufacture the carbohydrate products which are necessary for blossom bud formation.

All that is needed in the way of blossom buds to get a crop is anywhere from a quarter to one-third of the spurs blossoming. These can produce all the fruit that the tree will carry. The fact of the matter is, if practically all of the spurs on the tree are blossoming as 90 per cent, rarely more than 30 per cent set fruits. If 50 per cent of the spurs blossom half of those that blossom will in general produce fruits; if 20 to 30 per cent blossom, 85 to 90 per cent will set fruits, giving about the same production in bushels in each case.

QUESTION: What do you recommend for supplying nitrogen?

PROF. ROBERTS: Nitrate of soda or sulphate of ammonia. I do not know whether this should all be put on at one time or in several applications. The thing we do at present is to put on all that we use about three weeks before the trees blossom.

QUESTION: Have you made any estimate as to the relative value between nitrate of soda and sulphate of ammonia?

PROF. ROBERTS: Use about four pounds of sulphate instead of five of nitrate.

MR. SMITH: How do you put it on; work it into the soil?

PROF. ROBERTS: If you have a sod orchard, sow it broadcast. With the first rain it dissolves and goes into the soil. As to the amounts to use, that varies. We have said in a publication* that 15 to 20 year old Wealthy trees should have 5 or 6 pounds to begin with to see what it will do. There is evidence to indicate that in many situations increased results are secured from a heavier application.

Q. Do you know whether blight is worse in an orchard where you apply commercial fertilizer?

PROF. ROBERTS: Blight is apt to be worse where a strong vegetative growth is made.

*Wisconsin Agricultural Experiment Station Bulletin 317.

We had better take up the question of pruning now. Pruning has more possibilities in producing regularly, perhaps, than any other single cultural factor. In general old orchards have been consistently underpruned. In doing pruning work, if you have crowding or crossing branches remedy the trouble but *do your pruning by small cuts.* The result is that you get a greater vegetative growth out of the spurs close to which the cut is made. The removing of a large branch has very little effect upon the old spurs about the remainder of the tree. The cuts must be close to the old spurs in order to rejuvenate them. Take a pole pruner; do not take an axe or hand saw. One reason much pruning work is done poorly is because you do not have the right tools to do it with. Go out into the old orchard with a pole pruner. Spend 25 minutes the first year on each tree; after that ten or fifteen minutes every year will keep the tree in condition. Pruning with small cuts gives a greater vegetative growth of old spurs, leaves an evenly distributed fruiting surface and generally benefits fruit production.

Q. Any preference as to when you do that?

PROF. ROBERTS: Regular dormant pruning, but do the pruning by small cuts and do it regularly.

MR. SMITH: Is it not necessary where an orchard has been neglected, an old orchard, to cut off pretty large limbs, two or three inches in diameter?

PROF. ROBERTS: I should say as a general rule, absolutely not. And the reason I say that is this: The thinning out that trees need, unless it is dead limbs you are taking off, can be done with a small cut in practically all varieties, and when you take out one of those three or four inch limbs, what you have done is to make a great big hole in one corner of the top, and you have left the rest of the top just as thick and in just as undesirable condition as when you started in. Many of the trees in the state, old trees, need heading back from the top downwards where they are two or three inches thick, but to remove large limbs about the bottom of the tree is practically always unnecessary under our situations here in the state.

What I want to emphasize this afternoon is this,—your trees seem to respond to the possibilities that you give them. Blossom bud formation and fruitfulness, we are coming to believe, is a pretty constant matter. Your orchards vary because you do different things to them, and they are unproductive because you have not given them a chance to be productive. We have some measures to judge what the tree has done, as spur length and terminal length. We can also tell what the spurs have done from year to year. There is reason to believe if we get into the habit of looking at the trees that we can be pretty sure what we should do in a cultural way.

BUDS

A. L. SCHROEDER, College of Agriculture.

Buds represent the resting stages in tree growth and in fruit production, and from that part of the tree which develops into the fruit and branches. Because of this importance attached to buds it is quite essential for any fruit grower to have an adequate knowledge of where blossom buds are situated on the tree, and also to have some idea of the kinds of buds. Such knowledge will enable him to better judge what treatment is necessary to maintain his trees in a profitable condition.

A few explanations of terms generally used will be attempted before considering the differences in the fruiting habits of trees. Buds are grouped usually in three classes, according to their positions, as, terminal buds, lateral buds and spur buds. Terminal buds are found at the tips of new shoots. Lateral buds are formed at the sides of new shoots, developing during the growing season in the axils of the leaf stems, hence they are also called axillary buds. Spur buds are found on spurs. Spurs are generally defined as short branches, usually developing from lateral leaf buds. Spurs may occur on one-year, two year, or older wood. One-year wood represents wood of the past season's growth as distinguished from new shoots of the growing season.

Buds are also classified according to the kind of growth produced, as leaf buds, and blossom buds. Leaf buds produce leaves and vegetative growth. Generally the term "blossom buds" is used synonymously with the term "fruit buds." In this discussion, the term "blossom buds" will be used, which will include two types: 1. A simple blossom bud which produces only blossoms, such as we have in the case of plums and cherries. 2. A compound blossom bud which produces both blossoms and vegetative growth such as is found in apples and pears. It is important to remember that the fruit produced on a tree may not represent more than about one-fourth of the blossom buds which the tree bore, since the larger percentage of blossoms usually set no fruit. Either leaf buds or blossom buds may occur later-

ally, terminally, or on spurs. With some fruits, it is comparatively easy to distinguish a leaf bud from a blossom bud merely by the different size, shape and color of the blossom bud. Such a situation exists with the plum buds. The surer way of identification is to cut the bud lengthwise and note the structure. A leaf bud consists of only scales and rudimentary leaves, whereas a blossom bud possesses the beginning of flower parts. In this connection it is well to note that flower parts usually become evident in the new buds during July and August. In the following spring when the buds swell, these differences become very well marked.

FRUITING HABIT OF APPLE

The fruiting habit is fairly definite since most of the blossom buds of the apple are borne on spurs. A spur is usually a short growth at the end of its first year and increases yearly in length from a fraction of an inch to several inches. When a fruit is borne, a "secondary growth" is made at a sharp angle to the previous growth, and a large scar is left when the fruit is removed. When a blossom only is borne, the secondary growth makes less of an angle with the previous growth and a smaller scar results when the blossom drops off. When either a blossom or fruit is borne on a spur, the cluster base becomes much thicker than the adjoining growth of the spur, and it usually is found that a cluster base on which a fruit was borne is larger and thicker than one on which a blossom was borne. Usually a bearing spur fruits every other year although sometimes bearing successively, but often bearing only once in several years. A bearing spur, therefore, becomes angular and crooked with occasional thickened portions. After a number of years, the spurs become weak and fail to bear.

While generally apples bear on spurs, some varieties produce most of their fruit by terminal buds. Such varieties as Jonathan, Peerless and others have this terminal fruiting habit.

FRUITING HABIT OF CHERRY

The cherry produces its fruit buds laterally on one-year wood, and on relatively short-lived spurs. The buds on the spurs are quite plump, and arranged in a group of several buds. The terminal bud of the cluster may be a leaf bud which forms a new

vegetative growth. It has been found by Roberts[1] that the fruiting habit of cherry trees is directly related to the amount of annual growth made the previous season. If the annual growth is short, that is, under 6 inches, the lateral buds will be mostly blossom buds, and a lateral fruiting system results since there are few leaf buds to make spurs. On the other hand, if the annual growth is long, that is, over 12-14 inches, the lateral buds will be mostly leaf buds with a consequent spur fruiting system. The variety modifies the above figures slightly, since the Montmorency is found to have more leaf buds per given length of growth than the Early Richmond variety. The season, age of tree and part of tree are also considered as factors affecting the ratio between length of growth and blossom bud formation.

The spur fruiting system is recommended by Roberts as the better fruiting system, because of the greater hardiness of spur buds, and the possibility of production for more than one season on the same spur.

FRUITING HABIT OF PLUMS

European and American plums produce blossom buds laterally on one-year wood, and on spurs borne on two-year wood. The lateral blossom buds occur either singly with a leaf bud or in a group with one leaf bud between two or more blossom buds. The spur blossom buds are formed laterally along a short spur. The spur has no true terminal bud, but sometimes the "end bud" of the spur continues in vegetative growth. If no vegetative growth is made the spur dies after fruiting and becomes a short stiff spine.

Japanese varieties of plums produce blossom buds largely as lateral buds.

MARKETING OF WISCONSIN APPLES

M. B. GOFF, Sturgeon Bay.

I have no idea of discussing this question entirely as related to the technique of marketing methods. The past reports of the Society show able discussion of many of the factors of handling

[1]Roberts, R. H.—"Prune the Cherry Tree." Wis. Agr. Exp. Sta. Bulletin 298, 1918.

our Wisconsin apples, and those do not need to be repeated in detail now. I shall deliberately propose some ideas which will run just as counter to the opinion of many of you here as they do to the ideas of many of our fruit men at Sturgeon Bay. I want you to bring out your viewpoint in the discussion that I hope will follow. The function of this Society as an assistant to the successful marketing efforts of the fruit growers of the state is a vital part of thoughts on this question. What I want to say on this matter is largely my own viewpoint, and does not necessarily represent such opinion as has been crystalized on the subject in my own community.

The market for Wisconsin apples is not yet developed. Alternate years of shortage and surplus are reflected in the returns received by the growers. Either our fall and early winter apples meet a good demand in Milwaukee, Chicago, Minneapolis, and the few larger cities of the state, or they do not. We have, as growers, largely accepted the result, pocketed our winnings, or paid our losses, as the case may have been, and waited hopefully for another season. *It takes a jolt* sometimes to produce results, other than those to which we have been accustomed. We received just such a sudden shakeup at Sturgeon Bay the past year in the form of a disastrous hail storm just as we were ready to market our Wealthies. When we sat down in conference the afternoon following this disaster, not one of our growers who was badly affected by the storm had any hope that the crop would find any outlet but the cider mill. That the commission trade could not use what we had we knew all too well. *What we did* was what anyone else would have done under the circumstances —*looked for new markets.*

We used the *bulk car,* the *bushel basket,* the utmost care with our sorting machine, and marketed nearly twenty cars of fruit, that for the most part was not fit for barreling, to absolutely new trade, the farmers and country towns of Wisconsin. We used the cities on about a dozen cars more, but of high grade offerings, of better average than we have ever sold before, but the rural communities saved our lives. Two-thirds of the population of this state, in round numbers, lives in cities under *25,000* and rural districts. So far most of our commercial Wisconsin crop has gone to the centers of population where it has come in contact with the surplus of every other growing territory in the country.

The commission trade has not appreciably developed the consuming powers of our country districts for fruit, because it has been able to make a living without doing so. *If Wisconsin people* are to eat Wisconsin apples, *you and I as fruit growers will have to bring them to it.* Not only are the rural communities good customers, but they are scarcely as critical of the goods they receive, as are the city merchants. The rural trade wants a good honest pack, whether it be bushel baskets, barrels, or bulk cars, but *it is not willing to pay the added price* for the highest grades we produce. Exclusive of the fancy grades, country people will pay more for our apples than anyone else on earth. Even the past year when every man who owned an apple tree had a harvest, northern and western Wisconsin would have consumed infinitely more apples than were produced commercially all told in Wisconsin. Outside of the state, northern Minnesota, and northern Michigan are within reach of us on the basis of freight rates, and offer wonderful opportunities.

The advantage of this territory should be plain enough. Freight rates, high as they are at present, makes it suicide to ship farther than necessary to find a market. The difficulty of dealing with firms at a distance makes it necessary to use only the highest rated houses. Otherwise any contest over the acceptance of a car, or an arrival in bad order, is costly. From the selling standpoint, many of the best paying customers, and those which are most energetic in pushing goods, are among those firms whose financial standing is modest, or whose experience in business has not been long enough to entitle them to a high credit standing. Selling in such a limited territory as our own state, it is possible to accept many orders which would be absolutely out of the question in distant territory. Even though a controversy does come, an efficient traffic service will locate the cars promptly enough to allow diversion without loss or spoilage, and whenever necessary any of these places can be reached in a dozen hours by train or automobile. Moreover, through such a restricted territory it is possible for a salesman to so develop his personal acquaintance with the trade that he is able to work with the highest efficiency. In handling this kind of trade, the delivered sale becomes a necessity due to the unfamiliarity of the average consignee with railroad matters, and due to his unwillingness to accept the risk. But on a delivered basis more money can be

asked by the seller, and when the cost of carrying the risk of delivery is concerned, the seller if equipped with any sort of traffic assistance, is well paid for his extra hazard. If a hail storm had to come to Sturgeon Bay, we are glad that it came this year, not only because apples were cheap, but because in seasons of scarcity we would probably not have dug up the business that developed. As a result, "Wisconsin Apples for Wisconsin" is no unworked slogan for us; we believe in it because it means money in our pockets.

Another problem of marketing that has received little attention in Wisconsin is the provision for cold storage. We have said, as one of the talking points for our varieties, that we did not require storage, and that on this account these expensive additions to our equipment were unnecessary. I am consequently aware that my advocacy of reasonable cold storage facilities at the point of origin of our Wisconsin apples will meet with considerable objection. I am not proposing the methods by which such storages can be built, nor am I saying that they should be owned by growers or be public warehouses. I think they should be located close to the shipping point, and wherever possible in connection with a growers' packing station. To be commercially profitable they must of course be supplied with cheese or other products in sufficient volume to make the charge on apples reasonable. They cannot be erected at a profit in this state primarily for apples. But why cold storage for fall varieties? you may ask. It is a good question indeed. The answer is not found at the shipping point, but in the consumer's cellar, or in the retailer's store. Our Wisconsin apples I believe it is conceded are juicier and softer than those of the Pacific coast. They are on that account poorer keepers, and less adaptable to long hauls, and long holding. Weather conditions at picking time frequently induce the maxim of shrinkage and decay before shipment occurs. Delays in packing, sometimes inevitable in the hauling of a large crop, are serious interferences with keeping quality. Often the market conditions make a delay of a few days before shipment almost a necessity. Shortage of cars, inability to get refrigerators for special orders, temporary market slumps all act to prevent prompt shipment. I know it is said that apples should not stand at all before packing. With this sentiment I thoroughly agree. Neither should fruit remain in barrels any appreciable

time before loading on cars. Of this I am thoroughly aware. Likewise the best market at the moment is supposed to be better with our varieties, than a better market later which entails delay. It is just because I admit all of these contentions, and because I realize the human impossibility of doing the work as it should be done, that I am an advocate of cold storage. Naturally what I am saying relates to the carlot shipper. But if anyone here who depends on a distant market is not a carlot shipper, he had better become one quickly. If the spirit of co-operation is not strongly enough developed in his region to bring carlots together in his territory, he had better call on this Society and on his own initiative, to bring that about.

With cold storage comes the use of refrigerator cars. It is precisely because I feel that refrigerators are used far too little in the shipment of our fall apples, that I am more than ever an advocate of local storage. A dollar a barrel added to the price of Wealthies, and later varieties, through the use of cold storage and refrigerator cars would be a good investment. The amount of heat developed in a box car of apples, even during the latter part of the fall when the nights are below the freezing point, is far greater than one would imagine. The direct rays of the sun on the sides of the cars all day long heat up the interior to such an extent that a cold night can scarcely lower the temperature of the apples before morning. I am satisfied that delays of handling soon after picking have comparatively greater effect on the keeping and merchantable qualities of apples than delays later on. Every bruise developed during picking and packing is made doubly worse by a warm temperature. To use storage in the ideal way on our apples I would proceed in the following manner. I would devote all of the energy possible to handling the apples rapidly until they were packed in barrels. Then I would ship them immediately in refrigerators if the market were right, or would put them into the cold storage without delay. Once in cold storage I would handle them at my convenience, aiming to play the market, in the best possible manner. But in shipping out I would use iced cars long after this precaution would ordinarily be thought unnecessary. On such varieties as Wealthy, McIntosh, Snow, Northwestern Greening, and our other varieties of the same period, this method of handling would not only reduce the hurry at packing time and allow most effort to be put on

the packing where it belongs, but it would go far to stabilize the market through the reduction of spoilage and the consequent risks involved to the trade. As a means of winning our place irrevocably with the city markets nearby, nothing better could be devised. As a means of broadening our shipping radius to St. Louis, Cincinnati, and the far Dakotas this method is almost necessary, unless an ample supply of refrigerators is available. Even with early varieties like Duchess, cold storage facilities would sometimes save severe losses. The answer to the objector on this score is that the commission man frequently uses the cooler on these very varieties to save himself from loss. I am going to leave the balance of this cold storage discussion for you.

I do not wish to say much about packages in this discussion. I am not one of the men who believes that the day of the barrel is past, nor have I become an enthusiast for the bushel basket. The trouble with the bushel basket as it is at present used, is that it is a receptacle for fruit that never ought to go into bushels at all. I believe that if the bushel is to be used in the future with anything like the frequency with which it was used this year, it must be surrounded by the same set of legal requirements with which the barrel is guarded. Then an adequate inspection must be maintained. I trust that we may have a resolution passed at this meeting for this very thing. If the Wisconsin Apple Grading Law is to amount to anything for the commercial growers of the state it must be adequately enforced. Otherwise the confidence of the public in Wisconsin apples will remain at low ebb. The public does not discriminate between the quality of apples that are allowed to go into baskets, and those which are supposed to go into barrels. A bad basket leads the consumer to expect a bad barrel. But the packing that is done by the growers themeslves in bushels is scarcely as damaging to the public confidence as that done by the carlot distributors who buy in bulk, and sell in baskets. I am heartily in favor of the bulk car as a carrier of a certain class of apples, which are not of the average grade that it pays to barrel, but are far above the grade of culls and cider stock. But if we as commercial men are to arrive in the consumer's esteem within the next generation, we must prevent the middle man from doing what we ourselves do not dare to do with our packages.

Much attention has been given to the box for years in this Society. Many of you remember the joint debate that we had on the subject between Mr. Kern and Mr. Palmer. The question is still under debate, and will continue to be as long as these packages exist. The Colorado face and fill pack has some advocates in Wisconsin. Our good friend Mr. Jones of the Marketing Division feels that a consumer's size package, which can be sold at a price that will induce consumption, ought to be increasingly popular in this state. A face and fill box pack meets this requirement. My own feeling is that we have not yet exhausted the possibilities of the barrel. But I do feel that we ought to give the sized and wrapped box a thorough trial on McIntosh, wherever good color is secured, and even the early fall Dudley offers box possibilities. There is a time during seasons, just before the Jonathans make their appearance from southern Illinois, when the market is bare of good eating apples. This year about the only thing in evidence during this time was the California Gravenstein, and this variety brought as high prices as four dollars and a half to five dollars on commission men's sales to retailers. Our Dudley handled in iced cars would arrive in better condition than the Gravensteins, and if packed with equal skill, could without question bring similar prices. The Dudley has a texture and appearance, coupled with good size that should lend itself to this method of marketing. I can see our Secretary shaking his head at this suggestion, but he can have his turn later.

It is on the rigidity with which we should insist on grading standards that some of the bitterest fights are waged. We have in our own central packing house association just such battles. The good men of both opinions find more difficulty in getting together on this point than on any other. In western New York it is the rock upon which almost hopeless disagreement is breaking. Whether we shall pack at a minimum of cost, and thereby ship a grade which will compete on a par with the potato grading methods used in many other places; or whether we shall set out to make a name for ourselves which will be a foundation for good selling methods, is the point at issue. Little salesmanship can be applied to an ordinary mediocre quality article. No premium over the general markets can be obtained for it. No consumer's demand can be built up about it, and in years of bountiful

crops it must go for the figures which an overstocked market will pay. The commission man who buys that grade of goods is not deceived by it. He pays what he thinks it is worth. The only man who is fooled by such a pack is the grower who thinks that he is taking the short road to success. I do not deny that at times it may be possible to get as much or more money, when the cost of the packing and selling is concerned, for the medium value goods, than can be netted from the high quality product, but that will not often occur after a brand has made its own high reputation. There is only one field in the apple business of today in which the competition is not so strong as to wipe out most of the profits. That is the field of the high quality product. The consumers of this country will begin to consume apples freely when they can get good ones all of the time. If the housewife is charged an exorbitant price for poor apples, she is willing to forego the pleasure of getting good ones at about the same figure. For some reason the retailer differentiates very little between the prices he charges for good and fair grades. The only way to bring apples into consumption is to bring both the consumer and the retailer to a realization of the possibilities of well packed apples. This requires a selling system that will include the retailer in its educational program, and such a system cannot be built up about a poor product. Whether the apples are to be used for cooking or desert purposes, the same rule applies. A rigid standard of grading as regards blemishes and bruises and a standard for color proper for the purpose for which the product is intended, is the only road to progress in the apple business.

After all, the apple problems we have been meeting have been largely local. Until the fruit is in the package and on its way to market the broader relations of marketing do not begin to operate. In Wisconsin we have allowed the handling of our apples to be entirely local, and while the volume of commercial shipments from the different commercial sections has been small at best, the time is fast approaching when our products will meet each other in the same commission streets. The acreage of bearing orchards is rapidly increasing, and the next few years will see the yield quadrupled. Wise forethought would have us prepare now for the time when we shall need to know each other better. If there are any problems of general importance to the apple men of the state, we had better look to their solution. I

believe that the time is upon us now for concerted action. A certain amount of inter-county activity is warranted. We in the Sturgeon Bay area have held to a policy of proud self-sufficient isolation, and have, if the truth were known, pursued the methods of the conceited school boy. Perhaps you in other regions have been similarly guilty. Good judgment, however, would bring us into counsel on some of the related commercial phases of our business.

One of these questions is the package cost. Probably all of you except the Sturgeon Bay men cheerfully paid your dollar and a half for barrels last fall. Doubtless some of you buy your spray materials at retail prices, feeling as you do, so that you owe some poor dealer a living. While I will not deny that you do, I do deny that you owe it to the average dealer on such wholesale items as spray materials and packages. It would not be much of a trick to set up a Wisconsin Fruit Growers' Cooperage Company. Its details could be worked out very easily. Coopers are plentiful enough, and the Lord knows they are talkative enough, to make it possible to run a shop of our own. Ten thousand barrels or multiples thereof are most convenient sized units to manufacture. The freight rates on slack cooperage are so infinitely cheaper than those on madeup barrels, that a shop properly located should pay us good dividends, and should relieve us of the necessity of depending on others for barrels. Likewise the bushel basket is one of the most easily made containers from the manufacturing standpoint. Quantity contracts on these containers can not fail to give us advantages. The L. C. L. purchase prices for baskets add a real tax upon our business. In the matter of spray materials large volume purchasing has a very distinct advantage. The various companies are working hard to get association business, and care very little for small orders upon which they levy sufficient profits to pay all of the selling expense attendant to small volumes. I am not necessarily suggesting that we establish a Fruit Growers' Supply Company at the present time. But I am suggesting that something may be accomplished through agreements between us. Probably in the Sturgeon Bay region our larger volume of some of these articles makes us less dependent on this kind of co-operation. If so we welcome you to work with us for our mutual advantage.

Many other inter-sectional problems loom up. Almost no work has been done in Wisconsin on railroad rates. If the rates on apples from New York into this territory are fair, then our rates to our primary markets are hopelessly discriminatory. No localized effort is of much avail in the changing of railroad tariffs. It is possible by our combined effort to make the quantity of fruits shipped in Wisconsin look like a regular migration. We can have any reasonable thing that we ask for if we will ask for it unitedly. This whole question of railroad transportation needs careful study from our fruit growing interests. Such action in Michigan is relieving the situation which has allowed Georgia peaches to be shipped to Grand Rapids, Michigan, about as cheaply as Michigan fruits themselves can be shipped there. That many such inequalities can be found in our own state, I do not in the least doubt.

Market information is one of the things that is difficult for all of us to get promptly enough to be of the greatest value during the shipping season. Much market data is available now from many government and private sources. But much remains to be gathered which no one but ourselves can provide. Formerly the action of this Society in co-operation with other agencies outside of the state has attempted to relieve this condition, but this service should be widely extended. We need to know a day or two in advance of our strawberry movements just what is going on in southern Michigan. Year after year we have watched the high southern markets waver and break when an avalanche of Michigan consignments crossed the lake to be dumped on Milwaukee and Chicago. A few days afterward this glut always cleans up, but in the interval we in Wisconsin have our own troubles. To counteract this we ought to have advance information about the supplies of home grown berries, not only in our own state, but in Iowa, and Minnesota. You strawberry men have seen the whole strawberry market fall to the bottom all of the way from Rock County to Lake Superior within one day. Unusual weather conditions have brought on home grown berries through this whole territory at the same moment. But these questions are far broader than the strawberry crop. The interference of the small fruit crops of Iowa and Minnesota is sometimes very great with our cherries, and later with our early apples. To be intelligent shippers we should know about these things

sufficiently far in advance to plan our policy. In some years the knowledge of these factors in Sturgeon Bay would have given us a dime or more per crate in addition to our cherry price. Undoubtedly we can afford to gather this information in Door County for our own personal advantage, but the matter really affects the policy of us all, and should be treated as an intersectional problem.

It is perfectly logical for those of us in the fruit business to look to this Society as an aid in a constructive program for the betterment of the commercial fruit growing interests. I would not have you think that I do not appreciate the really great work which the Society has already done, in countless ways, for the advertisement and enhancement of our interests, but I do believe that if we among the commercial men will formulate our demands that the Society can meet them in a perfectly adequate way. I am not blind to the questions of public policy involved in having a state aided organization function as a private trade body, nor do I think that we as fruit men have any right to ask the state to finance our trade activities any more than the manufacturers of Milwaukee have to ask the legislature to maintain their organization. I do feel, however, that many of the questions which this organization should handle for the fruit growers are broadly enough in the public interest to justify the expenditure of state appropriations. Our trial orchard work is gradually relieving the necessity for the larger expenditure of past years, and a wise use of our funds would compel us to perform additional constructive work if we are increasingly to justify the confidence that the state has imposed in us. It is in the peculiarly horticultural phases of crop data, facts regarding materials used in fruit growing, legislation affecting fruit growing progress, and many kindred subjects that the society can be useful, and make a justifiable use of state appropriations. None of these activities needs to overlap with the work of existing state departments, but should on the contrary reinforce and assist their activities. The peculiarly horticultural phases of our industry which do not fall within the field of the College of Agriculture, or the Department of Markets, belong to us. In due respect to the other problems which these other agencies must face, they cannot give consideration to many of the questions to which we want a solution.

As a concrete suggestion, I believe that there should be a commercial fruit growing section organized within this Society. It should undertake to act as a trade association for Wisconsin fruit growing interests. It should under the guidance of the Society and its Secretary work out questions of market data in complete co-operation with the existing statistical bureaus of the state. It should stimulate co-operative business activity of fruit growers, but should not itself enter this field. It should not request an undue share of the Society's funds, and should remember that there are other horticultural interests within the state that are not primarily related to commercial fruit growing. Whenever the activities of this commercial section pass beyond the borders of those which are legitimately supported by state appropriations, the private resources of the industry should provide the support. In this way, I believe, the fruit growing interests of this state can best work in harmony and in this way the Horticultural Society can best continue its long record of helpful support of the commercial horticultural development of Wisconsin. Without this sort of activity, the problems of marketing our Wisconsin apples must continue to be solved by each locality in its own selfish interests, and when they are thus handled, the advancement of Wisconsin's apple and other fruit crops will fall far short of our ideal. If we are to succeed in these difficult times we must work together for our common good; and in our own field, no better means of stimulation exists than to back up our program through this organization which is ready for the purpose.

SPRAYING APPLES

PAUL E. GRANT, Menomonie.

When I attend a meeting of this kind the thing that I want to find out is, what the other fellow does,—why he does it and the results obtained. I don't care if his conditions are a little different from mine—if I can get these facts I can apply them or adopt them to my own problems.

Assuming that you feel as I do, I will state briefly our spraying plan for this year.

The trees in our bearing orchard previous to 1919 had not been sprayed. There consequently was some roughened bark to be cleaned up—no scab. This would have been worked off gradually in the course of the regular management, but this last summer we had a very bad blight infection, which was brought in by bees from neighboring farm orchards.

The farm orchards are typical throughout the state,—planted by people who know nothing of raising fruit, and who are too busy with their general farm work to give them the needed and timely attention they must have. They are a menace, and a serious one, and something should be done promptly, to provide for their care or removal. Blight of apple trees is as insidious as cancer in the human being, and calls for drastic and prompt action.

Along with the roughened bark condition and blight, we have a visitation of grain aphis. We want to catch as many of them as possible. We therefore shall put in a delayed dormant spray when the buds are swelling and aphis beginning to hatch.

This delayed dormant spray will be followed by the pre-pink when the clusters show color, but before the pedicels have sprouted, adding nicotine sulphate, if presence of aphis justify.

This is followed by the regular pink spray,—when the blossom buds are well separated in the cluster, just before opening. I believe this is the fruit spray recommended for this state aside from a dormant.

This past season, with us, development from pre-pink to full bloom took place practically over night. Owing to weather conditions, clusters held in the pre-pink stage longer than usual, and then, with a warm wave, burst into full bloom.

This may not occur again for some time,—again it may. If you are raising apples on any scale, you can hardly afford to take the chances. With a small acreage to get over,—one that you can cover in a day, it probably would not be necessary or advisable to apply this pre-pink spray unless you wish to grow top-notch apples—but, with a larger acreage, we do not feel safe in omitting this spray.

Following the "pink" comes the "caylx"—just as the last petals are falling and before the caylx closes on the main bud of each cluster.

In about ten days make another application.

This will probably carry you through until the spray for late brood of coddling moth and scab, somewhere around August 1 in our locality, unless you have conditions favorable for scab development.

We make a practice of putting on a spray between the 10-day and later coddling spray.

It goes without saying that you must first use the proper material, properly diluted and agitated, and *most thoroughly applied,* but even if you do this, it must go on at *just the right time.* It cannot wait until you finish planting or cultivating the corn or garden, or any if the hundred and one things you are hurrying to get out of the way. The spraying must be done *on time,* no matter what the weather, condition of ground or anything else. This means close watching of your trees from the time the buds swell in the spring and fast, thorough work at the proper stages of development. If your spraying has been disappointing, either you have not used the right materials, failed to do a thorough job or you have been too early or too tardy with your application. Our use of nicotine sulphate will depend entirely on the aphis situation. So much for our particular problem.

Personally, we have had the best success with good old lime sulphur, 32 or 33 Baume test, for fungicide. Dry lime sulphur may be good—we hope it is—but until the other fellow has experimented for some years with it, would hesitate to depend upon it.

Too much russetting with Bordeaux. Dusting we have found very expensive and unsatisfactory. We spray with 275 to 300 pounds pressure—with the wind, when we can. Use spray guns, because of speed.

With slight modifications to apply to purely local conditions, I know that a *careful* and *timely* application along the lines outlined will result in a crop of as fine, clean and attractive fruit as can be given anywhere in this country, providing, of course, you do the other needful things.

DUSTING TO CONTROL FRUIT INSECTS

BY S. B. FRACKER.

This paper and the next consist of a report of the symposium on dusting held at Chicago in December. So much interest has been expressed in this method of applying insecticides that it seems best to discuss the subject briefly at this time and outline the results of experiments in other parts of the United States rather than wait until the Wisconsin experiment station tests have been completed.

A special study of the control of sucking insects was the subject of the first report by Prof. P. J. Parrott of the Geneva, New York, station. Dusts containing one-half, one and two per cent of nicotine, respectively, were used.

Apple aphids were found unequally susceptible to the dust. From 91 to 98 per cent of the common apple leaf species were killed during a rainy period when the check trees lost 27 to 60 per cent from natural causes. The results were also satisfactory against the currant aphis, apple leaf hoppers, and nymphs of the four-lined leaf bug, but less so against the woolly aphis and potato aphis.

Air currents, denseness of tree growth, cold and wet weather and the presence of honey dew or waxy secretions of insects were found unfavorable for effective work. The high cost of nicotine preparations at present, according to Professor Parrott, makes the expense of dusting against sucking insects "almost prohibitive for large operations."

The results outlined by Dr. T. J. Headlee of New Jersey included work on codling moth, curculio, apple scab, and plant lice. His first table, which is given herewith, indicates unsatisfactory results against curculio, but successful applications against scab.

Year	Location	Curculio Per Cent			Scab Per Cent		
		Check	Dust	Liquid	Check	Dust	Liquid
1913	Glassboro	29.1	4.4	5.5	22.2	0.0	0.0
1913	Vineland	70.3	43.3	31.6	51.9	14.8	6.4
1914	Vineland	-------	3.68	3.88	-------	3.86	19.69
1917	Haddonfield	no record			57.83	5.05	2.52
Average		49.7	17.12	13.66	43.97	7.90	9.53

Further study showed conflicting data in the codling moth work. A study of the weather records proved that the applications made for the second brood, in which the dust was only half as effective as the spray, were soon followed by heavy rains and that the latter were a limiting factor.

The New Jersey results against leaf hoppers show that "the 90-10 dust impregnated with one per cent nicotine is as effective as that charged with three per cent, and only a little more than one-half as effective as the liquid treatment." Against recently hatched aphids also, the liquid materials gave better results, though the dust of one per cent strength or higher was decidedly effective.

Dr. A. L. Quaintance presented a summary of the dusting and spraying results of the U. S. Bureau of Entomology from 1915-1920. At Benton Harbor, Michigan, liquid applications in 1915, 1916, and 1917 resulted in from 87 to 97 per cent freedom from codling moth, and dust applications in from 80 to 98 per cent of fruit free from worms. With curculio the liquid spraying yielded 83 to 94 per cent clean fruit and dusting practically the same figures except in the case of one experiment, where only 5 per cent of arsenate of lead was used, the results being unsatisfactory. Against apple scab the dusting efficiency was only 15 to 87 per cent as compared with spraying, which yielded 83 to 95 per cent. In all cases several different dust mixtures were tried, but the results did not conclusively favor any one formula.

In Virginia, Arkansas, and Connecticut, codling moth and plum curculio were controlled by dusting to the extent of at least 84 per cent, except when the insects were extraordinarily abundant. The per cent of *scab*-free fruit, however, went as low as 30 per cent among the dusted trees. In Grand Junction, Colorado, dusting is nearly a total failure against codling moth, as this insect is unusually severe in the semi-arid region.

While cost was not discussed at Chicago, Bulletin 171 of the Oregon station publishes an analysis of the expense in the Hood River valley. The average cost per acre in 1920 for the entire program, including labor and materials, was $28.00 using spray guns, $33.00 in the case of spraying rods and nozzles, and $31.77 in the case of dust.

The conclusion reached by every speaker was that while dusting yielded some favorable results, it was less efficient, less suc-

cessful and more expensive than spraying, and could not be relied upon in the case of severe infestations.

REPORT ON THE EFFECTIVENESS OF DUSTING

By PROF. G. W. KEITT.

I have been requested to report to you on those discussions at the recent scientific meetings in Chicago which related to the effectiveness of dusting for the control of plant diseases. There was less work reported on this phase of the subject than on insect control by dusting, the chief paper being that of Dr. N. J. Giddings, of the West Virginia Agricultural Experiment Station on "Orchard Dusting versus Spraying."

The recent revival of interest in dusting has led to comparative spraying and dusting experiments at a number of state experiment stations. An effort has been made to correlate this work, and Doctor Giddings has acted as leader of the project. Accordingly, reports on the work in various states have been forwarded to him and were treated in his paper.

The dusting work that Doctor Giddings reports related to the apple, and was almost exclusively concerned with apple scab. He stated that in West Virginia the results thus far obtained have indicated that sulphur dust is not so effective as either lime-sulphur or Bordeaux spray for the control of apple scab in those orchards of that state where the disease is severe.

The evidence from Michigan and Virginia in 1920, he said, was much more favorable to dust. In Virginia, however, seven applications were made.

Pennsylvania reported good results from dust in two orchards in 1920 and just a fair control in a third. In these cases five applications were made.

In Connecticut in 1920 dust controlled scab well on Greening, which was but slightly attacked, but showed almost no beneficial effect on Fall Pippin, on which scab was more severe. Four treatments were made in each case. It was also pointed out that in Pennsylvania in 1919, when scab was severe, dust failed to control the disease, whereas it gave more satisfactory results in 1920, when scab was less severe.

In Nova Scotia in 1920 four applications of sulphur dust gave unsatisfactory results.

Doctor Giddings called attention to the fact that while certain commercial growers who had taken up dusting in West Virginia reported favorable results, certain others reported disastrous failures in scab control. He called attention to the dangers which might attend too rapid adoption of the dusting method in sections where scab is likely to be very severe. He expressed hopefulness that dusting would fill a useful place in orchard practice, but urged the necessity of further experimental work for determining the limits of this usefulness.

I fully agree with Doctor Giddings that the possibilities of the dusting method should be tested experimentally as thoroughly and as rapidly as feasible, and that due attention should be given to perfecting the dusting materials, machinery and practices. However, in view of the conflicting nature of the evidence from other sections and the great variations in results which may be expected from different seasonal and climatic conditions, I would recommend that Wisconsin apple growers approach the dusting problem from the experimental viewpoint, and delay any general change in practice until its merits have been proven under their conditions.

Thursday Morning Session

BASKETS

MR. J. T. GLASS.

(From Reporter's Transcript)

While the basket has been used for many years by shippers, its value as container for the shipment of apples has not been recognized by fruit growers. Market conditions have not always been favorable to the basket. These conditions have changed in the last two or three years, and are opening a better field for the basket.

Nowadays the consumer, especially the occupant of city apartment building, of all buildings steam heated or furnace heated, cannot buy many apples at one time, and a basket of apples is

just about the limit of the amount that he can purchase at one time, and in addition to that, the fact that the basket makes a handy package after it is empty helps in this,—the consumer knows the capacity of it, that it is uniform in size and he can compare prices of different dealers. But the principal reason has been that it provides just the right amount of fruit for him to purchase at one time and get the benefit of lower prices for quantity buying.

Now, since the use of the basket has been increasing rapidly, and since a larger number of growers have been coming to the use of the basket, it may be that some of the points in packing and loading which have been developed by the successful use of the basket might be of interest to you.

To begin with, a great many growers in some sections take their baskets right into the orchard and pack the fruit as it is picked from the trees. No attempt is made to grade this fruit, except the pickers are instructed to throw out any decayed or seriously wormy fruit and this pack is sold as orchard run. That pack sells especially in small towns and direct to the consumer, because the average family would just as soon have some large apples and some small apples in the basket. They can use the large apples when they have company and they can give the small ones to the children.

Where growers are depending on the larger city markets for the disposal of their fruit, they may be graded by hand or grading machine. Baskets are placed alongside the graders and different sized apples run into the baskets and the grader chute. The top is usually smoothed off, but they are still arranged in ring fashion over the surface of the basket, usually packed cheeks together. In addition to that it has the outside ring packed in paper. That paper on the outside ring serves two purposes, first, it advertises the pack, and, second, it prevents bruising or outside ring cutting.

I happened to be in New York city this summer and fall, and I could scarcely believe my eyes when I saw the amount of produce that was packed in baskets on that market. All kinds of apples, peaches, pears, plums and vegetables, such as carrots, parsnips, things of that kind, on the New York market, one of the most conservative markets in the country, where the commission men said they would never receive baskets.

There are a few essentials that should be observed in packing apples in the basket, no matter what sort of pack you are putting up. To begin with, unless you are ring packing from the bottom, and very few growers would do that because of the amount of labor involved, and I do not think it necessary, a basket should be shaken a couple of times when the apples are poured in. That may seem like unnecessary advice to most of you, but my experience has been, in observing packing in packing houses and orchards all over the country, that that point is neglected very much by packers, especially in the rush season. You can be very sure that your baskets are going to be well shaken during transfer, and if they are loosely packed at the orchard or packing house, they will be slack filled when reaching destination, and slack fill is always poorly regarded and has to be sold at a considerable reduction.

The face of the basket should be arranged in ring fashion. Whether you should wrap the outside ring in paper is a point which each one should have to decide for himself. It probably pays, especially if you want to advertise your product.

The degree to which the basket is filled is another important point. Probably about level or a half inch above the rim at the outside of the basket, rising to an inch and a half above the basket in the center, is about the proper degree. That will give you a little bulge to your cover as it is placed on, providing proper pressure to hold your apples in place and providing for settling in transfer. The use of a corrugated cap under the cover will pay very greatly, I believe. The corrugated cap costs but a trifle and it protects against bruising. Buyers usually show a preference for that. I have seen baskets packed with corrugated caps sell for as much as 25 cents more than baskets packed without, and the cap costs but 3 cents, possibly 2 this year, or less.

After the cover is in place, the wire handle should be bent inward and down to hold the cover in position. That is another point that is often neglected in the rush season, but it pays. When your cars are unloaded, the men handling those baskets are usually careless, a basket may be upset; if the cover comes off the contents will be spilled and wasted, and it takes very little time to bend those handles in while you are putting the cover on. If you are shipping by express in less than carload lots, parcel post or any other way aside from car lots, it is well to fasten

the cover at two additional points, at each side, half way between the handles. There is a special cover hook manufactured for that purpose, that hooks under the rim and bends over the cover, holds it in position and prevents pilfering or waste in transfer.

When you are stacking your filled baskets in orchard or packing house, or loading them on wagons or trucks, avoid as much as possible placing one basket directly on top of the other; instead of that, set them in such manner that you break joints, so that each basket is resting on the rims of two other baskets. That will prevent bruising.

DISCUSSION

MR. HARRIS: I have seen those baskets with center posts, is that an advantage?

MR. GLASS: There is a great deal of difference of opinion regarding a center post. The center post is good, there is no doubt about it, and it should always be used where you are stacking apples very high, as in storage, or going over four high in the car, you should always use it. In ordinary shipments, where we are only going three or four high, if you use a corrugated cap, I hardly think it is necessary. That has been the opinion of most of the shippers. One thing you should not do, and that is to invert your baskets when they are packed with fruit.

The proposition of storing apples in baskets is a new one, and the basket that has been manufactured the last couple of years has not been particularly adapted to the use of storing. However, some people have stored apples in baskets in spite of the fact that they were not well adapted, and are bringing manufacturers to realizing that they must make a basket with flatter bottom, heavier staves and especially adapted to the use of apple storage. The reason why some people are storing apples in baskets is largely because of the results of different investigations on the cause of apple scald, which have proved that scald is caused by lack of ventilation, by toxic gas which is given off by the apple itself, and it seems reasonable to suppose that by the use of baskets, which allows of better circulation of air through the stacks in storage, that the amount of scald will be considerably reduced. Doctor Lambert, of the Illinois Experiment Station, states that he made some comparative tests of the Grimes Golden apple, which scalds very easily; he did not do it intentionally, he had some Grimes Golden stored in barrels and he also stored some in baskets under the same conditions, same storage, and those in the baskets came out in excellent condition, while those in barrels scalded pretty badly. Mr. Hawkins, of the Bureau of Plant Industry, speaking before the Arkansas Horti-

cultural Society, made the statement that apples did not scald as badly in baskets as in other containers, and that he believed the basket was the coming pack for storage use. Now, that is a matter of opinion, and I would not recommend to anybody that we discard present methods of storing and take up the use of the basket, but I believe that you, as growers, owe it to yourselves to experiment with some, to see how well some of your apples may keep in storage in baskets. I believe that that will enable you, if you can store them in baskets and feed them to the markets gradually, to secure a better price for them.

SOME ROSES WORTH GROWING AND HOW TO GROW THEM

JAMES LIVINGSTONE, Milwaukee

"A rose by any other name would smell as sweet." These are the immortal words of Shakespere and he might have added that a rose by any other name would be just as popular. There is no question of the popularity of roses. There are rarer flowers and perhaps some are more aristocratic, but the rose is the bower of the masses. They are just as much at home in the garden of the lowly cottager, and just as sweet, as they are in the garden of the millionaire. From time immemorial the rose has held its place in the heart of mankind. To quote an old authority on roses: Many ages ago Anacreon sung the praises of the rose, he called it "The most beautiful of flowers," "The delight of the gods," "The favorite of the Muses," and since that time it has not inaptly been called "The Queen of flowers." Two thousand years ago Sappho wrote, "If Jupiter wished to give the flowers a Queen, the rose would be that Queen." It is frequently spoken of in Holy Writ, and Homer uses the rose figuratively in the "Illiad" and "Odyssey."

"While the rose was the most popular of all flowers amongst the ancient Greeks and Romans, the time and the means employed to install it an inhabitant of the garden remains perfectly unknown. In regard to its natural geographical distribution, it may be said to be confined to the northern hemisphere, none having yet been found wild very near to, or south of the equator. The vast continent of Australia, rich as it is in botanical treasures, has not yet revealed to us a single species. Siberia, Iceland

and Greenland have their roses, and one of those indigenous to Britain (Rosa Spinosissima) is the type from which two or three hundred varieties, under the name of Scotch roses, have sprung."

Warmer climates, however, have given us a much finer class, as China, Persia, India, etc., and from such material as the above have been created by hybridists the innumerable varieties now in cultivation. Some thirty species are noted by one rosarian and the varieties of these species, or families, are innumerable.

The study of the history and origin of these species, and their introduction to cultivation is intensely interesting, but it is obviously impossible in a paper limited to fifteen or twenty minutes, to even attempt to give an insight into this fascinating study. If we are to accomplish the objective of this paper, it will be necessary for us to confine our remarks to such varieties as are known to be hardy in Wisconsin. There are so many varieties on the market, most of them good, and nearly all of them suitable for growing in some locality of this vast country, that it is a matter of consideration for residents of each section of the country to consider which varieties are suitable for their locality and choose those which have been proven hardy. I must confess right here that I am not a specialist in roses, and there are hundreds of varieties catalogued that I have had no experience with. I have usually confined myself to varieties that I knew were hardy in the locality where I was located, and could be relied on to give a fair return for the time and money expended on them.

Growing roses is a good deal like growing apples, we all know that certain varieties of apples do better in some localities than in others and the commercial grower must choose those varieties which he knows will prove profitable in his locality. Of course, there is always a fascination in trying something new, and as variety is the spice of life, it is also the spice of gardening, and if we are to keep up our interest we must look for new varieties to conquer, or be conquered by them. My advice then to the common or garden variety of gardener, is to go in for the varieties the merits of which have been proven, and go lightly on those the merits of which are problematical.

For outdoor culture in this part of Wisconsin we have a great many varieties, some old and some new, that are well worthy of a place in any garden. Chief of those are the hybrid perpetuals. This invaluable and popular class has been produced by crossing

the hybrid China roses with different varieties of Chinas and Bourbons, the progeny producing abundance of flowers in the summer and occasionally a few throughout the autumn, thus being termed hybrid perpetuals. Some of our hardiest and best varieties of roses belong to this class, their ease of culture, hardiness, beautiful colors and fragrance combine in making them our most popular garden roses. Baroness Rothschild, Glorie Lyonnaise, J. B. Clark, Marshall P. Wilder, Magna Charta, Mrs. John Laing, Mable Morrison, John Hopper and Paul Meyron are considered amongst our finest varieties in this class.

To be successful in growing roses a sheltered location should be chosen, far enough away from trees, shrubs or buildings so that the roots of the trees or shrubs will not rob them of food and moisture, or the buildings shade them continuously. Roses require a fairly stiff soil and an abundance of food and moisture, and it is useless to attempt to grow them unless attention is given to these details. It is much better to plant them in groups or beds, where the soil has been specially prepared for them, rather than plant them promiscuously over the lawn or garden. If the subsoil is heavy clay it should be dug out to a depth of eighteen inches or two feet and the beds filled in with good rich top soil. Spring is the best time to plant, and in hybrid perpetuals, two or three year old dormant plants should be planted. Care should be taken when planting, to place the graft three or four inches below the surface of the soil and the small shoots should be cut out and the stronger ones cut back to three or four eyes. When the plants have become well established it is important to watch for shoots that may come from below the graft and cut them out or they will rob the plant of nourishment and ultimately kill it. These shoots can be distinguished from the true variety by the great abundance of small thorns which literally cover them. During the first season's growth it is better to pinch off most of the flower buds. This may seem heroic treatment to some growers, but it will greatly increase the strength of the plant, and insure a larger yield of flowers the following year. Roses are gross feeders and a well established plant ought to have frequent applications of fertilizer in some form during the growing season. Liquid fertilizer, bone meal or a good covering of well-rotted manure will keep them in good growing condition. The tips of the young growths are often infested with green or black

aphis. Frequent spraying with nicotine will keep them in check. For slugs and other chewing animals spray with arsenate of lead, or dust with slug shot. For mildew dust with flowers of sulphur.

No pruning should be done in the fall except to cut back any long shoots that tend to make the appearance of the bed untidy. Before severe freezing weather the plants should be gently bent over and pegged down and left in that way until there is danger of the ground being frozen. Before severe frost sets in, cover the plants with soil in the same way as you would cover raspberry canes, and then when the ground has been frozen hard a covering of stable manure can be put over the whole bed. This method is a good winter protection and also lessens the danger of the plants being stripped of bark by mice.

As soon as possible in the spring the manure should be taken off and as the frost comes out of the ground the soil can gradually be taken off, and the stakes that hold the plant down pulled out, allowing them to get back to their normal position.

Pruning should be done as soon as possible in the spring. All weak growths should be cut out and the strong growths cut back severely. Apply and dig in at this time a liberal dressing of well-rotted manure, or bone meal, and the plants are then ready for their growing season.

Hybrid Tea roses are becoming of more importance each year in the garden, and where the climate is not too rigorous, or if well protected in winter, they give wonderful results. Their culture is much the same as for the hybrid perpetuals, except that they do not need to be pruned so severely. Killarney, White Killarney, La France and Richmond are some of the older varieties that do well. Kaiserine Augusta Victoria is also a superb rose of this class, sometimes classed as a hybrid perpetual.

Tea roses or tea scented are a beautiful class of roses and where one can afford to plant a bed of them for summer display only, they give great satisfaction. However, they are only half hardy and will not stand our severe climate in winter.

Climbing roses have their place in every garden, no home grounds are complete without them and a place should always be provided for them. Their requirements as to soil and treatment are much the same as for the varieties already mentioned. Some of the old fashioned varieties like Baltimore Belle, Prairie

Queen and Seven Sisters do not need to be pruned so severely as the newer varieties, such as Dorothy Perkins, Lady Gay, Farquhar and Excelsa, a much better red than the old crimson rambler. These last mentioned varieties should have all the old flowering wood cut out as soon as the flowering season is over. The young growths should be spread out and tied to the trellis and given every encouragement to make all the growth that is possible. Keep them securely tied as the growth lengthens and if too many shoots start from the bottom select only enough of the strongest to cover the arch or trellis as the case may be and cut out all others. It is better to have half a dozen strong growths than two dozen weak ones.

Rugosa roses are splendid subjects for planting for effect, in beds on the lawn or in front of shrubberies. They are extremely hardy and floriferous and some of the newer semi-double hybrids make a wonderful showing when massed for effect. They are of easy culture and if planted in good rich soil and given room to develop they will make strong bushes and flower profusely for many years. The newer varieties should be given preference over the old single white and red. Blanche Double de Coubert. Colvin Tree, New Centuary, Madam Geo. Bruant, Sir Thomas Lipton and Alice Aldrich are all very desirable.

The seed pods should be left on Rugosa roses as they turn bright red when ripe and make a fine winter effect. Rugosas do not require pruning as severely as hybrid perpetuals. Cut out all weak growths and shorten the strong ones, so as to give the bed a uniform effect.

The old favorite Moss rose should have a place in every garden. There is no rosebud so elegant as the bud of a Moss rose, and the fragrance of foliage and flower is delightful. Elizabeth Rowe, Henri Martin, Mousseline and Princess Adelaide are all beautiful varieties and perfectly hardy. Their culture is simple and when once established they last for many years.

The Persian Yellow and Rosa Harrisonii are two of our hardiest and best yellow roses and are a fine combination with the Moss roses.

Another fine class of roses with miniature flowers borne in clusters is the Dwarf Polyanthas roses. Baby Doll, Cecile Brunner, Echo, Clothilde Soupert and George Elger are all fine sorts. These are all very dwarf growers and make a fine edging for a rose bed and are especially effective when planted in masses.

Rose Polyantha nana or multiflora can be grown from seed and if sown in early spring will be in blossom in June or July. They are perfectly hardy and when they get to be two or three years old they make good sized bushes a foot high and are literally covered with tiny single and semi-double blooms.

There are many other roses that, would time and space permit, are as worthy as those that have been mentioned, but if the efforts expended on this paper induce anyone to seek for more knowledge on this interesting subject, this paper will have attained its object.

THE MODERN PEONY

A. M. BRAND, Faribault, Minnesota.

The modern peony, such as we have it today, in all of its beauty of form, color combination, and fragrance, is the result of the patient labors of a small band of some twenty or thirty enthusiastic men and women, mainly of France, America, and England, through the course of the last 125 years.

Peony Albiflora, or peony Chinensis as it is sometimes called, is a native of Siberia and is found growing where the temperature often drops 60 below zero in the winter. In its wild state it is single and semi-double and, as its name would imply, is generally white. But Professor Hanson tells us that in his travels along the upper courses of the Amoor River he found it also in the different shades of pink and red.

The flower found its way into China in very early times, probably as early as the time of Christ, for by the fifth century A. D. we find it spread over that great empire and over Japan. Both the Chinese and Japanese are flower loving people. Their nurserymen are ingenius and painstaking to a marked degree. They found the peony with its different colors, its abundance of seed, and its tendency to throw sprouts an easy plant to work with and by the year 600 they are said to have had hundreds of varieties in singles, semi-doubles, and doubles. And the interest in the flower even at that remote period was such that they had peony societies and kept records of their varieties.

About the year 1800, English traders brought roots of different varieties from China to England and not long afterwards roots were taken from England to France. And it is in France that the history of the modern peony really begins.

Although China and Japan must have had thousands of varieties at the time the original importations took place from there to Europe, I do not find any variety of value that ever came from those countries with the exceptions of a very few Japs that have come to us of late years.

The French people are a wonderful people in their love for the beautiful. They were immediately taken with the beauty of the peony. The French nurseryman is second to none in the world. He is past master of his art. He took advantage at once of the great natural possibilities which the peony held out for improvement. Patronized in his labors and urged on by royalty and the rich, it was not many years before a score or more of flower breeders had brought about such a wonderful improvement in the peony that the craze spread to Belgium, Holland, England, and America.

Now, during a century and a quarter of time, a flower so alluring as the peony is and so easily improved as it is by cross fertilization, in the hands of so many people, is bound to produce a multitude of varieties. For, you must remember, the peony does not come true from seed. It does not reproduce itself in this way. Every seed produces a different kind of flower. Many originators have either not possessed the power of good selection, or if they did have the power, they did not employ it in choosing their varieties to name and place on the market for sale. The result is that we now have from a thousand to two thousand varieties, some good, some bad, and some of indifferent quality. You can easily see the confusion such a vast number of varieties would lead to and the position the person is in who takes up the catalogue of some of the great growers who list from four to eight hundred varieties for sale. I had before me when I wrote this article a catalogue of one of our great houses and, on looking through its pages, I came to LeCygne and Kelway's Glorious. Then I passed on to the descriptions of Duc de Wellington and Whitleyii and, to save me, I could not form any opinion at all from the descriptions as to which two of the four were the better flowers, and still the facts are that LeCygne and

Kelway's Glorious are the world's two greatest white, selling at $25 and $40 each, while the other two are just good peonies and may be had at 50 cents each.

So I thought when your Secretary's kind invitation to be present with you here today reached me I could not do better than confine this article to an attempt to give for the benefit of those who are just venturing into the field a list of choice peonies as I see them. I will have passed the half century mark next month. When I was born my father was in the general nursery business. You might say that I was born in the nursery and with the exception of a very few years I have been there ever since. The first thing that I can remember is my father's field of an acre of peonies. That was 44 years ago and from that day to this my interest in this greatest of all flowers has never waned. I worked with my father among the peonies up to ten years ago, when he retired. From that time on I have worked alone. During the course of all these years I think I have studied about every named peony that has come out and it is upon the opinions formed through these years of study of the flower that I base the list which I wish to submit to you.

We will start in France. France has had four great originators —Calot, Crousse, Dessert, and Lemoine. These men have produced in the neighborhood of from twenty to thirty good varieties each. But before taking up the work of these men I will cover the field of the work of several different European growers who produced just a few good flowers each. None of us would like to do without *Whitleyii,* that old sweet cream colored white, with its beautiful shadings. It was introduced by Whitley in 1808 and is still one of our very best commercial whites.

L'Indispensible is a magnificent flower of unknown origin. It came to us years ago under the name of Eugene Verdier and I have admired it ever since. I have had as high as ten thousand blooms open at one time and should I live a thousand years I would never forget the sight. It is a beautiful great even-colored hydrangea pink. Some years it waterlogs badly, which is its only defect.

Delicatissima is another splendid delicate pink whose origin is unknown. This flower has been sold under many different names, but it is always the same beautiful pink, a pink that has graced more June weddings than any other peony.

In 1824 Lemon sent out two good flowers in Edulis Superba and Grandiflora Nivea Plena. The first of the two is the best real early deep pink and the other the best real early white. We could not manage without these two flowers as there are no others to take their place.

Alexander Dumas, Canari and *Modeste Guerin* by Guerin are all good flowers, as are the two fine reds, Delachei and Purpurea Superba by Delache. For those wanting a good, bright, clean red on a very tall growing plant to use as a background for their varieties, Purpurea Superba is the variety.

Madam Ducel by Mechin is a first class pink. Marie Jacquin and Dr. Brettonneau by Verdier are both splendid. Marie Jacquin is of the water lily type and very fine. It is the best water lily type peony grown.

Festiva by Donkalier is a wonderful flower. It is a perfectly formed white with great broad petals as white as the driven snow, of great substance and most perfectly arranged. Some of the center petals are deeply blotched red. I like Festiva better than Festiva Maxima and were its plant habit as good it would be a greater flower.

Miellez gave us two great flowers of exceptional beauty, Festiva Maxima, with which everybody is familiar, and Mme. Calot, a beautiful flower with great broad flesh colored guard petals, surrounding a beautiful flesh salmon white center. It is one of the very best flowers for general planting.

This brings us to Calot, the first of France's really great peony breeders. Calot inherited the collection of the Compte de Cussey and, using this as a foundation for his work, produced and named many meritorious varieties. He continued sending out seedlings up to the year 1872. Of the Calot peonies I have selected 19 very fine sorts, all of which I consider well worth growing and many of which are strictly first class.

Constant Devred, Couronne d 'Or, Boule de Neige, Duchess de Nemours, Eugene Verdier, Eugenie Verdier, Mlle. Leonie Calot, Marie Lemoine, Mons. Dupont, Octavie DeMay, Reine Hortense, Triumph de Ex de Lille, Alba Sulphurea, Louis Van Houttii, L'Ecletante, LaTulipe, Mme. Crousse, Mme. Lemonier, and Gigantea. The first twelve varieties named are strictly first class in every way.

Eugene Verdier is a wonderful show flower. It is especially good when developed from the bud inside away from the sun.

Eugenie I like better by far than Eugene. It is one of those strong, robust varieties of wonderful constitution that always produces a world of bloom of the largest size. Its color is a delicate hydrangea pink.

Marie Lemoine, when grown in the proper soil so that its defective root system can produce at its best, gives a great creamy white flower, the most wonderfully fragrant of any peony in the world. Marie Lemoine, when well grown, is an absolutely perfect flower and stands with the very best in the show room.

Mons. Dupont is another great white washed with cream, and with occasional crimson splashes. It is splendid in plant and in form and beauty of flower.

Reine Hortense is a marvelous pink of beautiful form with its central petals prominently flecked crimson. It is an old flower, being introduced in 1857, and yet its merits are such that there is never stock enough to supply the demand.

Calot gave the world a long list of good varieties, of which Eugene and Eugenie Verdier, Marie Lemoine, Mons. Dupont, and Reine Hortense are his best. These are five great flowers that rank among the world's best.

Calot's work as an originator ceased with the year 1872 and during that year his collection passed into the hands of Crousse. It was a fortunate transfer. Calot was a great florist, but Crousse seems even greater. He was a tireless worker, very painstaking and during the years this great collection was in his hands he produced more good sorts than any other one man. He had a genius for selection and the flowers he named and sent out are, as a rule, of a very high standard. From 1872 to 1879 he continued to send out from the Calot seedlings, but from 1879 on the flowers were his own. The first good flower accredited to him in order of time is Livingstone, a magnificent deep pink and a flower hard to excel. Livingstone was introduced in 1879 and was followed during the next 17 years by such uniformly high class flowers as Asa Gray, Avalanche, Claire Dubois, LaPerle, LaTendresse, Madam de Galhau, Madam de Verneville, Madam Emile Galle, Marguerite Gerard, Pierre Ducharte, and Mons. Jules Elie.

Asa Gray is a striking perfectly formed pink with lovely pale lilac petals, sprinkled with minute specks of deeper lilac. A row of Asa Gray in good soil in full bloom is a sight never to be forgotten.

Avalanche is absolutely a peony without defect. It is a pure white with large guard petals encircling a cone shaped center of indescribable beauty, with just a faint tracing of red on an occasional inner petal.

Claire Dubois is one of the best commercial pinks. La Perle is a deep violet white with center flecked crimson. It is one of the most beautiful of all pinks, both in form and color. It is one of the choice flowers generally seen at the great shows.

LaTendresse, I believe Crousse's last good flower, is a beautiful tall growing milk white of exquisite form.

Madam de Galhau is wonderful for its remarkable coloring, color shades seen in no other peony.

Madam de Verneville is a beautiful bomb shaped white. Madam Emile Galle is a dainty pink of indescribable beauty. Marguerite Gerard, beautiful in the bud, is still more beautiful when the great uniform pink petals have opened out.

Pierre Ducharte is an immense ball of the palest lilac pink. Mons. Jules Elie is the wonder flower. This variety should always be sold to the person making his first venture in peonies. I had rather sell a beginner a Mons. Elie than any other peony. There is no escape from the lure of the peony after once seeing this great flower in bloom. Then there are the three Crousse's, Albert Crousse, Felix Crousse, and Marie Crousse, all wonderful flowers.

To this list I would add Auguste Villaume, Berloiz, Edmund About, Gismonde, LaRosiere, Mme. Boulanger, Mme. Forel, Mme. Geisller, Mlle. Rousseau, Mathilde de Roseneck, Meissonier, Mierelle, and Charlemagne, making 28 varieties in all. Some of you will be surprised that I include Charlemagne. Charlemagne is one of those late varieties where the buds often refuse to open. Oftentimes a plant will stand several years without a perfect bloom, but when conditions are right and the blooms do come good, Charlemagne is one of the finest peonies grown.

If you are looking for a clean bright pink without tracings of purple, take Marie Crousse. A thousand different pinks might

be mixed in a field and one Marie Crousse among them and you could pick out the Marie Crousse from the rest clear across the field. I would say that Albert Crousse, Asa Gray, Avalanche, Claire Dubois, Felix Crousse, LaPerle, LaTendresse, Livingstone, Mme. de Verneville, Mme. Emile Galle, Mlle. Rousseau, Marguerite Gerard, Marie Crousse, Mons. Jules Elie, and Pierre Du Chartre are the best Crousse varieties.

At Chenonceaux, in Southern France, lives a genial gentleman, styled A. Dessert, originator of Therese, which is generally considered the most beautiful of all peonies. Dessert, the greatest living authority on the peony, has produced many varieties and, as a rule, they are of the very highest order. While Calot and Crousse seem to have worked for beauty of form, for constitutional vigor of plant and profusion of bloom, Dessert seems to have worked also for beautiful color combinations and to have succeeded to a marked degree.

Two of his good varieties, Adolphe Rousseau and Pierre Dessert, came out in 1890. Adolphe Rousseau is undoubtedly the best early dark red. Pierre Dessert is also a very fine early dark red.

Eugene Bigot is a splendid late very bright dark red. Mme. Bucquet is another brilliant red, very attractive and midseason in blooming. Dessert has been very fortunate in his reds.

Laura Dessert is a beautiful large flower with cream white guards, with a bright canary yellow center. Primivere, heretofore considered the best yellow peony, I believe, will have to give first place to Laura Dessert.

Mme. D Treyeran, a fine rose white, with minute sprinkles of crimson and flecks of crimson on the central petals, is superb.

Mme. Jules Dessert, Mme. Manchet, and Raoul Dessert are all wonderful in their beauty.

Mons. Martin Cahuzac, almost a black peony, is the best of all dark red peonies.

Rosa Bonheur, a beautiful large violet rose, with carmine flecks on the guards, is a superb variety. I always like to sell this variety, as it gives such satisfaction, but I should also like to keep them all, as they are so perfect one hates to part with them.

Therese, one of the greatest of all show flowers, and generally conceded to be the world's most beautiful peony, is a magnificent light violet rose, changing to lilac white in the center.

Tourangelle, a delicate flesh tinted rose and salmon, is another magnificent variety. I think as much of it as of Therese. Flowers such as these will live forever.

Now we journey back to Nancy, directly east of Paris, I should judge a hundred and fifty miles. Here, where the great guns of the world war thundered for so long, we see a little garden where Crousse produced those wonderful flowers whose beauty will make his name immortal. Here we find Lemoine, the greatest flower hybridizer of all time. The uniform high quality of the Lemoine varieties is very noticeable. I cannot think of but one or two sorts that are not first class, and this is remarkable.

Enchantress, a chaste flower, is an exquisite late white.

La Fee is an immense bloom and a great show flower, with marvelous colorings. La Lorraine is a great cream white.

La France is a free blooming flower of great size, with large broad stiff petals well arranged. It is a beautiful apple blossom pink. This flower for years was the most sought after of all peonies with the possible exception of the elusive Lady Alexandra Duff.

Of Alsace Lorraine, Bayadere, Lamartine, Mme. Emile Lemoine, Mignon, Mont Blanc, Primevere, Solange, Sarah Bernhardt, and LeCygne it is not necessary to say which are the good ones. They are all good ones. Every variety is a masterpiece.

Alsace Lorraine was named for the then "Lost Provinces," and of Mt. Blanc it has been said "no more beautiful flower was ever created." Primevere, the yellow peony, has great white creamy guards splashed crimson enclosing an immense ball of the most delicate sulphur yellow. Solange is a flower so beautiful and of a color so difficult to describe that I have never yet read the description that would convey to my mind in even the remotest degree the beauty that this flower actually possesses.

Sarah Bernhardt is an incomparable flower named for the incomparable actress. It is immense in size, profuse in bloom, beautiful beyond all description.

LeCygne, The Swan, is an immaculate white, of great size, beautiful form, and considered the greatest peony ever produced. It is the last word in peonies.

Kelway and Son of England have sent out some very fine sorts. Their first great variety to be generally distributed in this country was Baroness Schroeder. This is a most attractively built flower, opening a delicate flesh white gradually fading to milk white. It is one of our very best whites.

James Kelway is another splendid white, being a free bloomer and very attractive.

Kelway's Queen is a uniform mauve rose. It is a very large flower with broad petals of great size and substance. It is a very distinct and noticeable variety.

Kelway's Glorious is a truly wonderful flower. I believe this flower to be all that Kelways claim for it. The call for it at $40.00 per plant is so great that I have been compelled by insistent purchasers to sell even the yearlings in my show bed. It is an immense white of indescribable beauty.

The controversy about Lady Alexandra Duff has at last been straightened out and there is now no question as to the purity of the stocks offered for sale by reliable growers. This flower is an immense light pale rose with extremely wide imbricated petals. When the plants of this variety become established it produces some of the most sensational flowers I have ever seen. It is one of the world's very best sorts.

Phyllis Kelway is a beautiful lavender flesh colored flower fading to white in the center. It is noted for its beautiful blending of delicate soft shades of color. The Kelways have sent out many varieties of not very high quality, but these varieties which I have named are of exceptional merit and all rank among our best.

Coming home to America, John Richardson, of Dorchester, Mass., was a plant breeder of the very highest order. He worked on a very limited scale growing seedlings in a small plot, but he loved his work and was painstaking. He was a plant genius, otherwise he could not have left us as he did four of the best varieties ever produced. His Milton Hill and Walter Faxon are wonderful for their good size, their pure and distinct colors, and their fragrance. Milton Hill must be cut in the bud and developed in-

side as its colors are so delicate as to be unable to stand the sun. His Grandiflora comes to us when everything else has dropped its petals and gone. It is a gem of the first water. It is a beautiful pink, beautiful both in form of flower and in color.

His Rubra Superba is also a splendid flower and is as late as Grandiflora. It is a fine crimson. It is surprising that the same man should have developed both the best very late dark red and the best very late pink and that both flowers should be of such superb quality.

I am inclined to believe that Mr. Hollis, also of Massachusetts, produced but three first class peonies. But these three will rank with the very best. Standard Bearer is a splendid variety. The habit of this plant is excellent. The stems are very stout and rigidly erect. They are strong enough to carry well their immense loads of beauty. Standard Bearer is a Madam Ducel on a very large scale. Loveliness is all the name implies. It is an immense flat flower of a uniform hydrangea pink.

Maud L. Richardson is another splendid Hollis variety.

Mr. Rosenfield has given us in Karl Rosenfield a flower of the first order. It is an immense bright red, a good bloomer, a fine cut flower, and a splendid show flower. Considering its shade of red it is one of the best reds ever produced.

Mr. Terry sent out a long list of varieties but I am afraid but few of them will stand the test when compared with those of the more discriminating growers. But his Rachel is a splendid flower.

Etta is very good. It is a late pink of good form and color.

Mrs. Pleas worked long and diligently with her seedlings and has been rewarded by seeing two of her varieties take the very highest rank. Jubilee is a wonderful white of great beauty, while in Elwood Pleas she has given us a very fine pink of a very pure attractive shade. Both varieties show up splendidly in the show room.

In regard to the new seedlings being brought out by the Thurlow's, I have never seen them but I have grown their Cherry Hill for some years and I am very much impressed with it. It is an immense flower of a peculiar and pleasing shade of red. Nor am I familiar with the new flowers of Mr. Franklin or of Mr. Shaylor only as I have seen them in the show rooms. Shaylor's Mrs.

Edward Harding as displayed at the Cleveland National Show where it received the $100.00 prize was a magnificent thing. There were three great blooms in the vase and every bloom was as perfect as any LeCygne I have ever seen. These were carried on stems as straight as arrows and nearly as large as my little finger.

Professor Saunders has shown some very fine new things. His Grace Loomis is a large fine white, and Sylvia a semi-double pink resembling very much a large semi-double wild rose.

This brings us down to our own seedlings. We have been growing seedlings at Faribault for 22 years on a large scale. Oftentimes we are carrying as many as fifty thousand seedlings at a time. During the last few years we have had the pleasure of seeing many of our varieties very well received by the peony-loving public. I do not believe it would be out of place for me to say that we have produced several sorts that take rank with the very best. We have introduced two fine whites, E. B. Browning and Frances Willard. Browning is an immense flower and very distinct. It is very late and needs good soil and good cultivation to bring it to perfection. The buds of this variety, as they arrive at the stage where the petals are just about to open, are as large as the old average sized peony in full bloom. The petals are of such substance that when touched with the finger and pressure exerted the entire flower gives. It is pronounced by some "the finest of all whites."

Frances Willard is a very fine flower of splendid form and a profuse bloomer. It is a large creamy white, with an occasional splash of crimson.

In pinks we have sent out several very fine sorts. Chestine Gowdy is a fine large profuse bloomer. It is a beautiful combination of bright pink, cream, and carmine. It is a cone-shaped blossom.

Henry Avery is a large pinkish white, rather loosely arranged flower, with a pronounced collar of golden yellow petals. It is very fragrant.

Luetta Pfeiffer, Mrs. A. G. Ruggles, and Judge Berry are very fine pinks. Our two greatest pinks are Phoebe Cary and Martha Bulloch.

Phoebe Cary is an exceptionally fine cup-shaped flower, with great broad imbricated petals, like those of a rose. Its color

is delicate and even, a pale lilac rose. The plant is tall, the foliage clean and it is a profuse and regular bloomer. The form of the flower is very beautiful and chaste.

Martha Bulloch, our greatest flower, is a sensation. I have never seen Martha Bulloch beaten in the show room when exhibited in show form. Of late years some of you attending the shows possibly have seen small specimens of Martha Bulloch. These probably came from plants set the previous September. Martha Bulloch does not come to perfection until on a three-year-old. Being a late flower, it calls for good cultivation. Then, coming in perfection, it has added to its immense size a beauty of form, arrangement, and color that cannot be surpassed.

It is a great pink that is one-half again as large as the average standard peony and it is so tall that it stands eight inches to a foot above the average other variety.

But it is in our reds that we excel. I believe it cannot be contradicted that we have a collection of seven different reds, all differing from the other, that are unexcelled, with the possible exception of Karl Rosenfield, and it may be Phillipe Rivoire.

These reds have the color desired and, in addition, have the form and size that so many other good reds lack.

They are Brand's Magnificent, a very dark red, with great broad petals arranged like those of a rose; Charles McKellip, a bright red of great size, also having broad petals; Mary Brand, an immense very bright red and an excellent cut and show flower; Richard Carvel, a strictly first class extra early red, in bloom with Edulis Superba at a season when there is no other good red. Red peonies, as a rule, are either offensive in odor or have no odor at all. Richard Carvel is a fragrant red, something unusual and very desirable. Winnifred Domme is a dwarf growing plant. It is a beautiful flower and, I think, the brightest of them all.

Lora Dexheimer is a bright red, very large and of a flat type seldom seen in reds. It is of beautiful color and very attractive form.

Longfellow is our greatest and finest red. It is a tall, straight-growing plant that produces a flower of perfect form, with broad petals, beautifully formed and placed like the petals of a rose. The color is exceptionally clear of any hue of purple. Long-

fellow is pronounced by the president of the American Peony Society, "The greatest red peony in the world."

This list of good peonies, long though it is, is incomplete, as it does not cover, as I have said before, the late productions of some of our American breeders. Nor does it cover the latest things from Dessert and all those fine varieties now coming to us from Millet, Rivers, Paillet, Savreau, and others, but it does cover a good list of choice varieties, such as will satisfy the wants of all but the very largest buyers. It is a list based upon my own taste and upon what I have noticed through the course of the many years I have made a specialty of the peony to be the taste of the average customer looking for good sorts.

Passing now from the subject of varieties, there are a few other things relating to the peony I wish to mention. It is generally said that the peony is free from all disease. As a rule this is true. The peony is the most free from disease and the attacks of insect enemies of any good flower that I could name. Its cultivation is of the simplest and the degree of satisfaction derived from the growing of it the greatest to be had from any flower, especially for those living in this latitude or one similar. But there is one disease to which the plant is subject, which, I believe, is a serious menace to the future of the peony. That is the disease commonly known among growers as the French root disease. It comes to you in the root you buy. It is easily detected, manifesting itself in the alternate more or less rough enlargements and contractions of the roots. It is a disease that no one seemingly need be afraid of, unless their grounds are small and they are compelled to grow peonies for years in the same soil. Little is understood of the disease, but it seems to be contracted by the living plant from the soil where diseased plants have been previously grown. To the person growing peonies on a small city lot, I would advise never to plant varieties having this disease, no matter how beautiful they may be. The disease is found mostly on some of the Lemoine varieties, some of which are so badly infected as to be almost worthless. Varieties badly infected with the disease throw up but a short feeble growth and seldom give any bloom. Fortunately La France, LeCygne, and Primevere, three of his best sorts, are free from the disease, while Lamartine, Mme. Emil Lemoine, La Fee, Mont Blanc, Solange, and Sarah Bernhardt in some stocks are infected,

while other stocks are free from the disease or practically so. This disease is really the only peony disease that is at all serious.

Another matter I wish to touch on hastily is the use of fertilizers. Most people have an idea that the peony is a heavy feeder and, knowing that decomposed barnyard manure is a splendid fertilizer, use great quantities of it about their peony roots every year. Manure is all right, in its way, and to get a continuation of good bloom year after year from the same plants more or less of it must be used. But people in their enthusiastic search after the beautiful blooms, as a rule, overdo the thing. Instead of not using enough fertilizer, they use too much. Too much manure causes an overgrowth of foliage, a weakening of the stems, and causes decay in the crowns of established plants and, I believe, is one of the factors that tends to bring about conditions favorable for the development of the disease, botritis, in the plants. Any good ordinary soil will produce good peonies with a good application of manure about once in three years.

Finally, I wish to say a few words on the making of collections of peonies. Now we have all kinds of collectors in this world. We have the collector of cancelled postage stamps, the collector of old coins, the collector of beautiful pieces of china, etc., etc., and so on without end. And we also have the collector of peonies. Now, the making of a collection of peonies is a fine thing, so long as it is carried out along the right lines. The collector of cancelled postage stamps adds to his collection every different stamp he can possibly beg, buy, or steal. It doesn't make any difference whether it is a pretty stamp or not. The question of looks has nothing to do with it. But it is different with peonies. What the collector of peonies should be after is beauty, and beauty only. We have in the world at the present time about 250 very fine varieties of peonies. When the collector, if his means will allow of buying them all, has exhausted this list of good ones, he should stop, carefully adding to his list the good new ones as they come out.

Why, some people have what is called the "Peony Bug" so badly that they lose sight of the idea of beauty entirely in making their collections and make their lists up by purchasing every variety they can buy of a certain originator's, whether the flower is good or not.

Others make up their collection laying stress on pretty names, the element of beauty not entering into the transaction at all.

This fall we were sending out a few roots of a new variety of ours that we were just introducing. It is an exceptionally beautiful flower that we feel assured will compare with anything we have heretofore given the public. We had named it for a very fine old lady, Mrs. Jennie R. Gowdy, who is a great friend of ours. I am getting so I like to give to my best flowers the names of intimate personal friends. To dispose of the 25 roots we had to spare we mailed 25 personal letters to as many of our old customers. From one we received the unique reply that he was undecided whether to take a root or not. He thought he would like the root, but he did not like the sound of the name. He went on further to state that when he had started to make his collection he allowed the beauty of the "sound of the name" to influence him very much in making his initial purchases. He stated further that another gentleman, giving his name, a man whose name is now familiar to every informed peony lover in America, in making his first purchase was guided entirely by the fact of whether names of the varieties had a pleasant sound to his ear or not.

Of all things, don't let such considerations determine the varieties you buy. Buy the good peonies—and the good peonies only. Even when buying Brand varieties, buy the good ones and then stop. For what we all should want, as far as peonies are concerned, is good peonies, good peonies only, and more of them.

DISCUSSION

QUESTION: What is it that affects a peony if it grows up apparently hardy, and has started to blossom, yet they wilt and droop down?

MR. BRAND: That is either caused by your plant being near big trees, so that the roots extend out and take all the moisture out of the soil, or all the substance out of the soil, so that the peony just has strength enough to come to the stage where it is going to open its bud and then has to fail, or else it is caused by the fact that your peony is planted too deep. It is one of those two things that causes that. It is either lack of moisture or substance in the soil which you cannot supply near big trees, or it is a fact that the plant is planted too deep.

QUESTION: What is the proper depth to plant a peony?

MR. BRAND: I would not plant the peony deeper than 2 inches, that is, the tip of the buds deeper than two inches below the surface of the soil.

MR. MOYLE: Have you ever noticed any injury from late spring frosts on your blossoms?

MR. BRAND: Oh yes, that is very often the case. If your plants are up 6 or 8 inches high, then you have a hard frost that even though it does not seem to affect the plants at the time, you do not get a good blossom that season. It is more true of the early varieties than the late.

THE GLADIOLUS

ELMORE T. ELVER, Madison.

The subject, "Gladioli," assigned to me, is so comprehensive that the short time allotted for discussion can little more than introduce the speaker. A proper discussion should cover the history, cultivation, propagation, origination of new varieties, the value of the gladiolus in commerce and as a cut flower, its use as a decorative plant and in landscape gardening and a discussion of individual varieties with reference to desirability and non-desirability, and kindred subjects which must readily suggest thousands to the listeners. In consequence of lack of time, I will endeavor merely to touch a few of the salient features connected with my subject.

Our forefathers at the time of the adoption of the United States constitution ordained that "no title of nobility shall be granted by the United States." Notwithstanding, we have by common consent proclaimed the rose as the queen of flowers, and I am satisfied that the modern gladiolius with its stately, majestic and regal beauty must be hailed as the king of all flowers.

Its advantages over all other flowers is so manifest that I dare say no other can compare with it. It is easily cultivated, is free from disease, incomparable in beauty, both as to form and variety, easily propagated, and gives itself to creation of new varieties in a simple and satisfactory manner. Its long period of bloom, from early July until frost, at a time when few satisfactory flowers are blooming, makes it indispensable as a decorative flower for the home, and as a flower for commercial use it has no equal.

The gladiolus, or sword lily, derives its name from the Latin *gladius* (a sword) and is a diminutive thereof, meaning little

sword. It may be correctly and interchangeably pronounced gla-dí-o-lus or gla-di-ó-lus. The plural is properly glad-í-o-li, altho it is sometimes written gladioluses.

Botanically, gladioli are cormaceous plants belonging to the family *Iridaceae,* to which family also belong the crocus, ixia, freesia and iris.

The corms of the different species vary in size, shape and color. Usually they are white, yellowish or red, covered with a brown skin. The size of the plants vary from a few inches to three or four feet. The leaves, which contribute so much to the beauty of the plant, vary in length, breadth, and color, some of the species having only two leaves and others four or six. The leaves are slender and graceful, often recurved, so as to give the flower spike, which arises at the summit of this plant, more prominence. The flowers in some species are arranged on only one side of the stems, on others on both sides.

The gladiolus does not enjoy the historical prestige, nor has it been revered in poetry and song to the extent of many of our garden beauties. The homage paid the rose fills volumes; the peony was a great favorite before the birth of Christ; the hyacinth is named after Hyacinthus, the beautiful boy, beloved of Apollo, and the narcissus after narcissus, the handsome youth, for whom Echo, the nymph, pined away in unrequitted love, until she became a mere voice.

Notwithstanding the distinction accorded to these favorites, we are willing to agree with Sir Francis Bacon that God created flowers before He created man, and while our favorite was created at the same time as other flowers, its virtues were discovered later, but when once found and developed, sought and found its place at the top.

Considering the gladiolus historically, it is, however, not improbable that the Greeks and Romans both made use of the native species, and mention is made thereof in the writings of Dioscorides, and Atheneus tells us that gladioli were planted on the graves of the virgins.

The botanists and herbalists of the sixteenth and seventeenth centuries, dealing with the plants of Europe, gave little attention to the gladiolus and it is not until the middle of the eighteenth century that we can discover any considerable classification or addition of species.

Geravde, in 1597, mentions four forms of gladioli; Bradley, in 1728, six forms, and in 1739 additions are made by Breyne. The real classification of the gladiolus commences with Linnaeus, in his first edition of Species of Plants, in 1753. This was followed by Ker, who was the most prominent investigator working on the order of Iridaceae during the first thirty to forty years of the nineteenth century. In his work, published in 1805, he provides a list of 225 species, to which he added for a considerable number of years. After Ker the development is carried on by Dean Herbert of Manchester, who died in 1847, and Dr. F. W. Klatt of Hamburg, whose publications between the years 1863 and 1875 added considerable to the work.

John Gilbert Baker, in his system of Irideae (1878), classified about seven hundred species, and in his Handbook of Irideae (1892) fully described 926 species. Later additions were made by Mr. Baker (1896-97), dealing with the species originating in the Cape of Good Hope region.

The G. commuius, found in central Europe, and G. segetum, from the Mediterranean region, were taken to England in the sixteenth century and at that time were important garden plants. The G. byzantinus, or Constantinople, was introduced prior to 1629.

G. Blandus was introduced in 1774, and G. cardinalis and G. Floribundus in 1789, all from Cape Colony.

Up to the time of the introduction of the last mentioned species, little or nothing had been done in the way of the improvement of gladiolus. However, with the introduction of these improvements commenced, which have steadily advanced until we have the beautiful and varied glads of today.

The species mentioned were well adapted for the garden, flowered early and seeded freely. Cross fertilization being very easily accomplished in the gladiolus new forms soon appeared.

The first efforts at hybridization were made by William Herbert, who, in 1818, reported his results to the Horticultural Society of London. For more than forty years thereafter he was an active gladioli enthusiast and hybridizer, although he gave his name to no variety.

In the development of the modern gladiolus, the first important hybrid was provided at Colville's Nursery, Chelsea, Eng-

land, in 1823, and is known as the G. Colvillei. This hybrid is still grown today.

The second important is known as G. ramosus, appearing about 1835. It was obtained from seed of the G. blandus of "Fairest Gladilios."

Up to this time and until 1840, hybridization and cultivation of glads has been primarily that of the amateur. It had no serious standing in the flower world and was given no attention by seedsmen or nurserymen. Now, however, *the* important thing occurred in the gladiolus world. A new type was produced. This type was the real start of the gladiolus of today.

M. Bedinghaus, gardener to the Duc o' Aremberg, in about 1839, produced a seedling known to nearly all present as the G. gandevensis. This was purchased and introduced in 1841 by the famous Frenchman, Louis Van Houtte.

The second type, with which you are all familiar, was produced in 1848 by Mr. Hooker of Brenchley and took its name as G. Brenchleyensis.

About this time the master mind appeared upon the scene. M. Eugene Sauchet, the gardener for Napoleon III, at Fontainebleau, was the greatest of all breeders. During the time he occupied the stage, from 1850 until his death in 1880, his hybrids outranked all others.

The impetus given to the gladiolus by the work of Van Houtte and Sauchet and others was further stimulated by a visit on the part of Queen Victoria to Fontainebleau in 1855, who there saw and greatly admired Sauchet's hybrids and conveyed her enthusiasm therefor to England and imparted it to her subjects.

In 1875, Victor Lemoine produced the G. Lemoinei; simultaneously Herr Seichllin produced the G. Luchllinii. This stock was later sold to the great American nurseryman, John L. Childs, and, after further cultivation and improvement, has become known as the G. Childsii; G. nauceianius was produced by Lemoine in 1889.

The foregoing practically was the work up to the present century. The present century has given us a distinctly new phase in the primulinus hybrids. The offspring from the G. Primulinus introduced into England by Baker in 1890. The hybrid was first produced by Coyeaux and introduced in this country by Thorburn.

The ruffled gladiolus is a new and distinct American type created by H. C. Kundred of Goshen, Indiana.

OUR WISCONSIN NATIVE TREES

By WILLIAM TOOLE, SR., Baraboo, Wisconsin.

At the recent annual meeting of the Sauk County Country Life Association, we were told of the thousands of people who visited our state last summer to enjoy the goods roads and beautiful scenery of "Wisconsin Beautiful." And, it is said, that the people from other states left thousands of dollars in return for their appreciation of sojourning within our borders.

These beauties of scenery, of lakes and streams, of hills and valleys embellished with trees and shrubs, belong to all of us, for the seeing of beautiful landscapes is free for the enjoyment of all who are capable of appreciating the grand pictures which the Creator has designed for us.

We view the pictures on every side and occasionally see an eminence which has been denuded of trees and shrubs, and, as we gaze on the bareness, we realize how drear would be the picture if there were no trees or shrubs to beautify the landscape.

Now that our state legislature has provided for rural planning committees to direct our attention to the need of saving the surroundings of natural places of scenic beauty, and perhaps to educate us to a better appreciation of the decorative uses of the sylva of our state, it seems that we should become better acquainted with the different species of our native trees.

All through the year we have the beauty of the changing colors and graceful outline of trees and shrubs on our wooded hills and by shaded watercourses. While not so distinct in contrast the changing and various shades of green of the forests in the spring are fully as charming as the more brilliant splashes of color given by the ripening of the leaves in autumn. In spring or fall the practiced eye can tell at a distance the contrasting shades of oak, maple, hickory and poplar. What an interest is given to the landscape view by the pines and birches at many prominent eminences! In the winter what a relief to the eyes is given by the blending of the dark browns and grays of the

woods with the snow view, which would be so monotonous if not thus relieved.

There is much to be seen in the woods in winter that is interesting. Then, more than at any other time, we realize how much the woodlands shelter and maintain the wild life, which is the joy of the hunter, and a pest to the farmer.

We find in the snow tracks of the tiny mouse, also the rabbit, squirrel, and fox, to deer, while about the trees we find evidences of raccoons and porcupines. Then the woodman makes the acquaintance of the friendly chickadee, and the daring nuthatch among birds. Indeed, we would sadly miss our native trees and shrubs if they were removed from our landscape, even if we retained them about our homes.

In the past we have thought of the planting of trees mainly for street and roadside decoration, with some trees about the house for shade, and we have given less thought than we should to the value of some kinds for ornamental use aside from shading purposes.

This paper is written with a desire to draw attention to the usefulness of the various species of trees, hoping that some may be led to seek a closer acquaintance with the distinctive qualities of the various genera and species of Wisconsin native trees.

A paper of this kind must necessarily be brief, but anyone interested in the subject can find closer descriptions to identify kinds in Gray's Manual of Botany.

Taking up the consideration of kinds of trees in botanical sequence, the evergreens are first in order and pines should head the list. Evergreens on private grounds are not planted as much as they should be and I think not so freely as they have been, probably because so many mistakes of placing have been made in the past.

It has been necessary to cut out many beautiful evergreens on home grounds because they have been put where there was not room for them to develop. Considered from an economic standpoint the White pine—*Pinus strobus*—is the most important of our evergreens, and, when rightly placed, there is no kind more valuable for decorative purposes.

We should bear in mind that the time will come, with age, when the conical or pyramidal form which is adopted as a stereo-

typed shape for evergreens will be outgrown, and the trees will assume a dignity of proportions making it seem out of place as a front yard ornament. Where there is room for an additional kind of pine the Red pine, sometimes called Norway pine—*Pinus resinosa*—is a good companion to our White pine. The beauty of effect of evergreens is possible and, in many places, exists through planting or sparing, entirely independent of home surroundings.

The Gray pine—*Pinus Banksiana*—is not of much importance, either in an economic or decorative way, although it is sometimes planted. When we consider the poor soil where this species is most abundant, as we see it in natural groves, we should feel thankful that the Gray pine has been created for such places.

Among the evergreens we have a deciduous conifer—the Tamarack or American larch—*Larix laricina*. The wood is useful in many ways. For ornamental planting it is more graceful in form than the European species and thrives well in ordinarily good soil, although found growing wild, mostly in swamps.

Our native White spruce—*Picea canadensis*—ranks with the best of the evergreens for ornamental plantings. It will fit into more restricted surroundings than will the White pine, but should have room and a suitable aspect.

The White spruce is so very good for planting we do not need to plant the Bog or Black spruce—*Picea Mariana*. Formerly people planted the Balsam fir—*Abies balsamea*—for ornament. It has an attractive appearance when young and small, but looks old and disappointing as soon as it fairly becomes a tree. Don't plant it for permanence.

To me the handsomest of our native evergreens is the Hemlock—*Tsuga canadensis*—also called Hemlock spruce. In the days when the soles of our shoes were all leather, lots of Hemlock bark was used for tanning. The wood is coarse grained, but is a useful substitute for pine for rough work. While of slow growth in cultivation, there is graceful beauty of the tree, which is well worth striving to secure.

The Arbor Vitae or White cedar—*Thuja occidentalis*—is so useful for posts and poles it is difficult to conceive how we can get along for need of them when they become as scarce as White pine lumber now is. We, in the southern part of the state, who usually see the White cedar only in cultivation, marvel at the

size of the poles shipped from the north part of the state for electric and telephone lines. For a clipped screen or hedge the Arbor Vitae is useful; in cultivation a number of interesting forms have been developed which have proved valuable in the nursery trade. Where there is room the Arbor Vitae is useful for variety, but cannot be our first choice among evergreens.

Our Red cedar—*Juniperus Communis*—is in disgrace, like the Barberry, and perhaps we will be ordered to banish the species. It is said that it harbors and disseminates a fungus which injures the leaves and fruit of the apple. In exposed situations the leaves sometimes in the spring become so brown as to be scarcely attractive. The natural habitat of this cedar is rocky hillsides, but it spreads to adjacent woodland pastures, and probably the eastern species—*Juniperus virginiana*—may have escaped from cultivation and seem to be a native.

Next in order comes our willows in great variety, but many kinds are more nearly shrubs than tree-like. Dr. J. J. Davis of the Botany department of the University informs me that we may safely count on the Black willow—*Salix nigra*—and the peach-leaved willow—*Salix amydaloides*—as growing into real trees. The latter makes a graceful appearing tree and deserves a place in ornamental planting.

The poplars fit well in the forests for landscape effect, and some use could be made of the Quaking poplar—*Populus tremuloides*—in ornamental planting. The species ordinarily called Yellow poplar—*Populus grandidentate*—is useful in the woods as a filler, and adds to the landscape effect. The wood is useful for box material and in cheap cabinet work. There seems to be no special place for it in ornamental planting.

The Balsam poplar or Tacamahac—*Populus balsamifera*—might be used for ornamental purposes in some situations. The fragrant resinous buds in the spring are interesting. It makes a better appearing tree than the foreign Balm of Gilead, which is often planted.

The Cotton Wood—*Populus deltoides*—is a useful, quickly growing tree, but the habit of shedding a copious supply of "cotton" in the spring, discourages planting it near to dwellings.

The walnuts—White walnut or Butternut—*Juglans cinerea*—and the Black walnut—*Juglans nigra*—are useful for nuts and

the wood, which is so valuable in cabinet work. The Black walnut makes a better appearing tree than the Butternut, which is more open in growth, while the nuts of the latter are more general favorites. They should be more generally planted for their nuts.

The hickories are an important section of our native trees. Chief among our Wisconsin natives is the Shell Bark or Shag Bark hickory—*Carya ovata.* The nuts are general favorites and the wood is so useful in the furnishing of farm implements. The mature trees have a fine appearance and are often spared on the farms, and it would be planted more than it is if transplanting was not so difficult. The distinguishing feature of the Shag Bark hickory is the loose hanging strips of bark, which can be readily stripped from the tree and are useful to the camper for kindling out-of-doors fires. The White Heart hickory or Mocker nut—*Carya alba*—is a tree having the general appearance of the Shag Bark, except in the bark and nuts. When cut into the wood shows much more white, making it useful for ax helves. The bark does not loosen and strip off and the nuts have very thick shells. The Bitternut hickory—*Carya cordiformis*—is a smaller tree than the preceding with smoother bark and more slender branches. The nuts are thin shelled, but too bitter for use. The name Pig Nut hickory is sometimes used here, but I cannot learn that this species—*Caray glabra*—is native to Wisconsin.

The Hop Hornbeam—Leatherwood, or Ironwood—*Ostrya virginiana*—is among the smallest of our native trees. The curious seed vessels, like clusters of hops, always attract attention. For ornament, but not for shade, it is worthy of a place in any fair sized collection.

The Beech—*Fagus grandifolia*—is plentiful in the eastern part of the state, but rare otherwise. The nuts would be good, if not so disappointingly small. The wood has value in many ways, but I do not know if the tree has value for ornamental planting.

The birches are an interesting class of trees and deserve to be more generally planted for ornament. I do not think we have the Black birch—*Betula lenta*—a native of this state. Some claim it, but I think they confuse it with the botanical name of the Red or River birch—*Betula nigra.* The best known and most common of our birches is the White birch, also called Paper and Canoe birch. We associate it in our minds with the

White pine, because it often grows in like situations and forms a notable contrast with it. At many a prominent height the White birches form a distinct addition to the landscape. As an adjunct to the lawn, our native White birch is superior in usefulness to the European cut-leaved variety. I cannot learn for certain that the other White, or Canoe birch—*Beula pendula*—is a native of this state. Doctor Davis says he thinks it is found near Racine.

I have never seen the Yellow birch—*Betula lutea*—as a planted tree, but it makes so fine an appearance in the woods, I think it should be freely made use of if it will bear transplanting. The filmy loosening layers of yellow gray bark are noticeable, but not so showy as that from the White birch. The stems and young buds are slightly aromatic.

The Red or River birch—*Betula nigra*—is quite plentiful along the Wisconsin river, especially on the right side above Portage, and, I suppose, in other parts of the state. As may be seen on grounds near Madison, the Red birch is very attractive as an ornamental tree.

The oaks form a very important section of our native trees. For economic value of wood, with usefulness for shade and ornament, probably the White oak—*Quercus alba*—takes the lead. We always think of sturdiness and endurance in connection with the oaks. In the early days the acorns gave valuable food for our hogs. In implements, furniture or buildings the wood is valuable. One needs a chapter or a book to tell of the usefulness of the oaks.

The Bur, or Over Cup oak—*Quercus macrocarpa*—grows to a noble tree in favorable situations, but when starved on poor soils, the trees have a decrepit old-age appearance. We see some grand specimens of this species of oak as we ride through many parts of the south half of Wisconsin. The Swamp White oak—*Quercus bicolor*—is found growing in the rich lands bordering creeks or rivers and is of more slender growth, but, otherwise, is very much like the White oak. The wood has the same valuable qualities where strength is needed. We have in southern Wisconsin the Chestnut oak—*Quercus Muhlenbergia*—I am told. The leaves, resembling the chestnut, are a distinguishing feature of this tree. Gray's Manual of Botany locates the Shingle or Laurel oak—*Quercus imbricaria*—to southern Wisconsin. The leaves are described as smooth-edged and lanceolate in form.

The following oaks, Red oak, Yellow oak, and *Quercitron* or Yellow Barked oak, also called Black oak, might be placed in a class by themselves, because, through a general resemblance, people often confuse them. The Red oak—*Quercus rubra*—is the most distinct of the three. It forms a tall tree in heavy woods, where the other two are seldom found, but it is seldom found with the Yellow oak. The wood is coarse grained and is not as good for firewood as the others. Leaves and acorns are large.

The Yellow oak, sometimes called Black oak—*Quercus elipsoidalis*—sometimes colonizes on loamy soil, but often mingles with real Black or *Quercitron* oak on light and poorer soils, and but rarely in rich woods where the maples and basswoods grow. The leaves are deeply cleft and the trees are often mistaken for the Pin oak of farther south. The Black or *Quercitron* oak—*Quercus velutina*—is most commonly found growing in poor sandy soil. The bark on mature trees is dark brown and rough. The inner bark is orange yellow and is of especial value for tanning. These latter species of trees are valuable for shade or ornamental purposes. *Q. elipsoidalis,* when in groves, is subject to injury by a fungus which infests the roots, killing young thrifty trees. I have found trees which I think were hybrids of the White and the Over Cup oaks, and it is probable that the other species make natural crosses.

We have several trees belonging to the Nettle family—the elms and the Hackberry. There is probably no species of distinctly American tree more generally planted for shade and ornamental purposes than is the American White elm—*Ulmus americana.* In mature trees, its distinguishing features are unmistakable, but in planting the mistake is often made in substituting the Red elm. There is so much diversity of form in full grown trees of the White elm it seems as if it would be worth while for nurserymen to propagate forms of special attractiveness. The wood is useful in secondary ways.

The Rock elm—*Ulmus racemosa*—has much the same general appearance as the White elm. The principal difference is in the form of the flower clusters and the bark of branches on young trees. The wood is valuable for lasting qualities, resisting decay, and is also valuable for good wearing qualities. The Red or Slippery elm—*Ulmus fulva*—grows tall, but not to so nearly a large tree as the White elm. It has no particular value as a

shade tree and is but secondary for ornament. The mucilaginous inner bark has some value in medicine and children like to chew it. The wood is light, strong and durable. In the old days we liked the Red elm for ox yokes and in sled construction. If the wood was more plentiful, it would be still more often used in boat building.

The Hackberry or Sugar Berry—*Celtis occidentalis*—belongs to the same natural order as the elm. This tree has much value for ornamental and shade planting. It is valuable for street planting where a tree less spreading than the White elm is desired. It is variable in size and some trees in the forests furnish fine saw logs, yielding lumber valuable for hard wood flooring. The leaves are peculiar in form, having slanting bases. The berry-like fruit is sweet and eatable, but the pulpy covering is too thin to be useful. The birds appreciate the berries.

A few species in the Rose family may be included in our list of trees. Our native Crab apple—*Pyrus ioensis*—is deservedly popular for the beautiful and fragrant clusters of flowers. There is much variation in fruit and flowers. The best of the fragrant fruit is valuable for jelly and sauce. Scions of the native crab unite readily in grafting with common apple roots and it would be well worth while to propagate some of the most showy varieties. The Mountain ash—*Pyrus americana*—when fruiting is a very showy small tree, and there are many places where it might be planted with advantage. The showy fruit is not agreeable enough in taste to be edible. The Wild Black cherry—*Prunus serotina*—or Rum cherry, we used to call it in Rhode Island, is a finely appearing tree when in mature form. In furniture the finished wood shows a beautiful grain and color. The birds appreciate the fruit, to which they are welcome. The Wild Red or Pin cherry—*Prunus pennsylvanica*—makes a small tree, which might be useful as ornamental but for its persistent sprouting from the roots. It is notable because the cultivated kinds of cherries will unite with it in budding.

Our native plums are in great variety in the wild state and crossing in cultivation has produced an increase in kinds. We have native the types of the Canada plum—*Prunus nigra*—and our more common Wild plum—*Prunus americana*. Our native plums are beautiful when in bloom, yet their planting is recommended mostly for utility of the fruit.

We might say much in praise of the maple genus, because of symmetrical and graceful trees, refreshing green or red-tinted leaves—in spring giving some of the earliest spring flowers, and painting with such brilliant colored foliage in autumn. The wood is useful in so many ways, while maple syrup and maple sugar have distinctive qualities which we all enjoy. The Sugar maple—*Acer saccharum*—heads the list for economic value, and is a leader among ornamental shade trees. The leaves are among the brightest showing autumn coloring. The Silver maple—*Acer saccharinum*—one of the soft maples, is found native generally near river banks. It makes a fine tree, more openly spreading than the Sugar maple. In some places it is badly infested with the cottony maple scale, but where free from this enemy it is well worth planting. The Red or Swamp maple—*Acer rubrum*—is found in our high ridges of clay soil even more plentiful than in swamps. It does not make so large a tree as either of the two species mentioned. The trees are attractive in the spring because of the abundance of red flowers and in the fall the ripening leaves vie with those of the Sugar maple for brightness of color.

The Box Elder—*Acer negundo*—makes fairly good fire wood.

The Basswood—*Tillia americana*—called Linn in the south and Linden in Europe, gives a dense shade. The tree is symmetrical when grown in the open and is a useful street tree. The light, strong wood is useful in manufacture. Formerly the inner bark was used for the same purposes to which Raffia is now made use of. The flowers are valuable as abundant sources of honey.

The wood of the White ash—*Fraxinus americana*—is so useful it is a cause for regret that so much has in the past gone for firewood. It forms a shapely tree and gives good shade. The specimens which have been left about farm homes in the timber lands make a fine appearance. I am informed that we have also the Red ash—*Fraxinus pennsylvanica*—and the Green ash, which in Gray's Manual is given as *F. Canceolata*—a variety of the Red ash. We are also credited with the Blue ash—*Fraxinus quadrangulata*. White ash certainly deserves to be more often planted. Perhaps the three other kinds are desirable. The Black ash—*Fraxinus nigra*—with tall trunk, not heavily branched, and with gray, flaky bark, is distinct in appearance, but not specially attractive. The wood furnishes good basket material and barrel hoops. It will flourish in any good soil, although found wild mostly in low ground.

In Gray's Manual Wisconsin is credited with the Tulip tree—*Liriodendron tulipifera*—and the Kentucky Coffee tree—*Gymnocladus dioica.* For identification of species, a botanical description is necessary. Those who are interested are referred to Gray's Manual of Botany.

The following list of our native trees is given:

COMMON NAME	BOTANICAL	COMMON NAME	BOTANICAL
White pine	*Pinus strobus*	Swamp oak	*Quercus bicolor*
Red pine	*Pinus resinosa*	Chestnut oak	*Quercus Muhlenbergia*
Gray pine	*Pinus Banksiana*	Red oak	*Quercus rubra*
Tamarack	*Larix laricina*	Yellow oak	*Quercus elipsoidalis*
White spruce	*Picea canadensis*	Black oak	*Quercus velutina*
Black spruce	*Picea mariana*	Laurel oak	*Quercus imbricaria*
Balsam fir	*Abies balsamea*	White elm	*Ulmus americana*
Hemlock	*Tsuga canadensis*	Rock elm	*Ulmus racemosa*
Red cedar	*Juniperus communis*	Red or Slippery elm	*Ulmus fulva*
Black willow	*Salix nigra*	Hackberry	*Celtis occidentalis*
Peach Leaved willow	*Salix armygdaloides*	Wild Crab Apple	*Pyrus ioensis*
Quaking poplar	*Populus tremuloides*	Mountain ash	*Pyrus americana*
Yellow poplar	*Populus grandidentata*	Wild Black cherry	*Prunus serotina*
Balsam poplar	*Populus balsamifera*	Pin cherry	*Prunus pennsylvanica*
Cotton Wood	*Populus deltoides*	Canada Wild plum	*Prunus nigra*
Butternut	*Juglans cinerea*	Wild plum	*Prunus americana*
Black walnut	*Juglans nigra*	Sugar maple	*Acer saccharum*
Shellbark hickory	*Carya ovata*	White maple	*Acer saccharinum*
Mocker Nut	*Carya alba*	Red maple	*Acer rubrum*
Bitter Nut	*Carya cordiformis*	Box Elder	*Acer negundo*
Hop Hornbeam	*Ostrya virginiana*	Basswood	*Tillia americana*
Yellow birch	*Betula lutea*	White ash	*Fraxinus americana*
Red or River birch	*Betula nigra*	Red ash	*Fraxinus pennsylvanica*
White birch	*Betula alba*	Blue ash	*Fraxinus quadrangulata*
Beech	*Fagus grandifolia*	Black ash	*Fraxinus nigra*
White oak	*Quercus alba*	Tulip tree	*Liriodendron tulipifera*
Bur oak	*Quercus macrocarpa*	Coffee tree	*Gymnocladus dioica*

EVERGREENS FOR THE HOME

MR. A. HILL, of Dundee, Illinois.

(Read at Annual Convention, January, 1921.)

I want to apologize, I am not Mr. D. Hill, I am merely his son; it was impossible for father to come, and I just represent him.

It would seem almost like carrying coals to Newcastle for me to come to a state that was originally covered with evergreens to talk about evergreens, but as my subject is evergreens, every kind, I want to offer a word in behalf of the Forest Tree Association of the State of Wisconsin. If it is a good forest tree association, it needs your support; if it is not a good organization, it certainly needs your support. Perhaps few of you know of the part that your own despised Jack pine plays in the development

of the forest of Europe, but before the war it was no uncommon thing for the D. Hill Nursery Company, who are small exporters of conifer seeds, to extract seeds from 15 carloads of Jack pine cones for export to Europe, to be planted by the commercial nurseries in Germany, France and England and other districts in western Europe to produce forests on the poor sandy lands where the Jack pine is at home.

I am merely a nurseryman, I am not a horticulturist, I do not raise fine apples. Our nursery ships out in the course of a year ten million plants and we think that is some job in the spring of the year to get men to dig carefully and grade properly and pack securely ten million plants for distribution over the United States. There is one nursery in Germany whose annual shipments total 250,000,000 plants, a large portion of those plants being made up of young Jack pines grown from seeds of the Jack pines from the forests of Wisconsin.

With the President's permission, I will take a few minutes to speak of Federal Quarantine No. 37. Perhaps, as horticulturists, few of you have followed the development of this law, which is a quarantine act to prohibit the importation into this country of plants, nursery and horticultural products originating in any foreign land. It has been said that it was selfish nursery interests who fostered this movement. This isn't so. It was not the nursery interests, which were given small consideration, because the total amount of products imported into this country for distribution by nurserymen would perhaps total yearly $2,000,000, hardly equal to what the state of Massachusetts spends in one year in controlling the brown tail and gypsy moth, so they were given small consideration. It is the large horticultural interests, the forestry and the agricultural interests whom they are protecting. They have brought into this country, as the speaker last night mentioned, the brown tail and gypsy moth, the citrus canker, the chestnut blight disease, which has up to date wiped out all the chestnut forests in the east, and the White pine blister rust. Now, the White pine is a native of Wisconsin. We sent it over to Germany, they inoculated it there, not intentionally, I would not say that, but they sent the inoculated, the diseased plant back into this country, and now our entire country is threatened with this White pine blister rust, which works on the five-leaf, or soft pine. While it does not cause any great amount

of worry in Illinois, because we do not grow White pine, but the timber owners on the Pacific coast, where they have the first cousin of your native White pine of Wisconsin, the White pine of the Pacific coast, and the wonderful Sugar pine of the Pacific coast, it is of a great deal of importance that that disease does not become established in their forests.

Another branch of industry closely allied to the horticultural interests of the country is the Bureau of Plant Industry at Washington. It needs your support. They have a hard time to get money to carry on the work, the necessary research work to finance the traveler's work who goes into China and Japan and cold parts of Siberia to bring back fruits and vegetables and other horticultural products that will succeed in our country. They issue a very interesting little bulletin called "Plant Enemies." The Bureau of Plant Industry has been established about ten years and during those ten years brought into the country 45,000 different varieties of plants and agricultural products to be planted in five growing stations and distributed throughout the country for trial. They brought in the Smyrna fig, brought in new rice that they grow in the adobe lands of California, and of course numerous other plants and fruits of a great deal of value to the United States, and, as I said before, it is hard to get their appropriation to carry on this work, and we who are interested in allied branches of horticulture should support it to the limit.

EVERGREENS FOR PROTECTING AND BEAUTIFYING THE HOME

The purpose of this paper is to suggest the importance of improving our surroundings and to show how unattractive conditions may be made appealing through the planting of evergreens as windbreaks, hedges and ornamental groups.

The need of beautifying the home appeals to us more strongly every day. The home is the foundation of the nation. In clean and attractive surroundings the children become strong, upright, honorable citizens. Anything that will make the home better will tend to improve citizenship.

The essentials of a good home are a man and woman resolved by their mutual efforts to make this world a better place in

which to live and a structure that will protect life and health from undue exposure to the elements. If the dwelling is to be really a home, it must be more than a place in which to eat and sleep. Inspiration to better living must be there, *incentive* to strive diligently for the highest ideals and to attain these ends. Not only must the physical needs of the family be supplied moderately well, but the home must be attractive.

The evergreen is something nature has given man to typify eternal promise, the promise that spring shall always come again. In snowy winter, it gives the only note of comforting color to the bleak landscape. In summer it adds serenity to the riot of colors that the smiling sun coaxes forth from nature.

An evergreen is like an old friend, the storms of years, the strife of a lifetime only make richer his noble character. So is a home surrounded by evergreens like a man with many true friends.

In the storehouse of nature are many things beyond your power to possess, but any lover of nature can surround his home with evergreens. In their manner is grace, in their color is rest, in their presence is inspiration, their influence is perpetual. An evergreen is truly a tree with a great and noble character.

For purposes of discussion, I will divide the planting of evergreens into two divisions:

Evergreens for the Farm.

Evergreens for the City and Town Home.

It is a source of great satisfaction to know that my father was a pioneer in preaching the gospel of evergreen planting for our prairie farmers. His life work has been devoted to the development and growth of hardy evergreens, to give the needed protection to wind-swept prairie homes. What could be a finer reward than the letters he receives each day, from the honest farmers who are enjoying to the fullest extent the beauty and protection of his friendly old evergreen trees.

Evergreens planted by farmers are usually arranged in the form of a windbreak, screen or shelter-belt around buildings, orchards and fields, whereas evergreens planted by the city or town dweller are selected and arranged for the artistic improvement of the landscape.

I will discuss fully the planting of evergreen windbreaks on the farm and confine my remarks on the use of evergreens for town and city planting merely to a list of varieties, such as can be recommended for ornamental use, under the soil and climatic conditions existing in Wisconsin.

The home owner who lives in town can take advantage of assistance from a landscape gardener or practical plantsman, in the selection of good varieties, and their proper arrangement to produce the right effect, while such service is not always available for the farmer.

In the discussion of windbreak planting for the farmer, my argument will be entirely from the practical point of view. Do not, however, get the impression that a fine well-grown evergreen windbreak is not a "thing of beauty and a joy forever," nothing could be more beautiful than the snow-laden pines on a frosty winter's morning. When you know evergreens, you feel in their presence the hush of the vast forest, you see the silent sentinels, evergreens, typifying permanency, defying time and the elements.

WHAT IS A WINDBREAK?

What is a windbreak? For the benefit of those who may not be familiar with the term "Windbreak," I will explain that any body of trees which gives protection to buildings or crops may be called a windbreak. This paper, however, will deal only with evergreen trees. Deciduous or leaf-bearing trees, are also used for windbreak purposes, but they are less effective in checking the force of the wind than a row of Evergreens.

HOW A WINDBREAK PROTECTS.

The influence of a windbreak upon air currents is purely mechanical. Its effectiveness depends therefore, upon how nearly impenetrable it is. The ordinary windbreak of willow, cottonwood or ash, does not provide much protection from the cold winter winds. A good evergreen windbreak will provide almost an absolute barrier to the wind, some air may force its way between the branches and foliage of the evergreen trees, but the movement of air on the leeward side is stopped completely or nearly so.

An evergreen windbreak is any row or belt or body of trees which checks the force of winds passing over an area in the lee

of it. By reducing the force of hot or cold winds, a windbreak may help to make the home more comfortable for man and stock within the zone of its influence. Less feed is required in winter to provide bodily warmth and nourishment to farm animals protected by it and they will be more comfortable in summer in its shade. Less fuel is needed to properly heat a home in the lee of a windbreak and the buildings themselves will deteriorate more slowly if not exposed to the full force of the elements.

WHAT A WINDBREAK WILL DO

A good evergreen windbreak will shield an orchard from winds which might strike the trees when they are heavily laden with fruit, or protect the trees from cold winds which cause the winter killing of branches.

REDUCES EVAPORATION

There is no part of the United States, except small areas in the Appalachian and Cascade Mountains, which normally obtain more rain or snow than is needed for growing the best crops. The farmer usually plows, cultivates and mulches with the object of conserving every drop of water that may reach the soil during the year.

Anything which helps to conserve the moisture of the soil is of direct benefit to the farmer. An evergreen windbreak has this effect in a marked degree. The drying power of the wind is reduced by the windbreak very nearly in the same proportion as its velocity. In the immediate lee of the most effective windbreaks, evaporation is reduced as much as 65 per cent. The amount of reduction depends a great deal upon the density of the windbreak.

Windbreaks are especially valuable, therefore, in the middle west, where the cold freezing winds of winter and the hot dry winds of summer are of frequent occurrence throughout the year.

EFFECT ON TEMPERATURE

The farmer who has cultivated crops on a hot summer day, need hardly be told that the warmest part of his field is the portion which is sheltered from the wind. In the lee of the wind-

break, there is not only no breeze to cool the body, but the actual temperature of the air is raised. Tests with a thermometer have shown that the area which is protected by a windbreak may be several degrees warmer during the day and several degrees cooler during the night, than adjacent areas not protected.

EVERGREEN WINDBREAKS FOR ORCHARD PROTECTION

Orchards may be affected both favorably and unfavorably by the increased temperatures due to windbreaks. The rapid ripening of the fruit and of the wood of the trees in late summer, is just about offset by the danger of accelerating the growth of buds and the blossoms in spring; on the other hand, where warm spring winds, like the Chinook, are involved, the effect of the windbreak will be beneficial in spring by preventing this warm air from striking the trees.

Most fruit trees, especially at time of blossoming, are very susceptible to the least frost. A lowering of 4 or 5 degrees in the minimum temperature might mean the difference between a mere chilling of the tender fruit blossoms and actual freezing. Damage however, from slight, dry freezing, is not apt to lead to a complete loss of the fruit crop, such as occurs when blossoming trees are subjected to a storm of rain, sleet, or snow accompanied by wind.

TEMPERATURES

It is a well-known fact that the same temperatures as registered by thermometers may very differently affect human comfort owing to differences in the quality of the air, its humidity, or most of all its rate of circulation. Low temperatures which cause no discomfort when the air is calm, becomes unbearable when a wind springs up. This is so widely appreciated that windbreaks are, perhaps, chiefly valued for the protection they give against strong winter winds. That there is a considerable saving in fuel in heating a well protected house, requires no proof. A good windbreak may reduce wind velocity as much as 80 or 90 per cent immediately to the leeward. Evergreens are of course, much superior to deciduous trees where winter protection is desired, and even a narrow strip of spruce or pines, consisting of only a double row planted close together and 20 feet high, reduce the wind velocity at 100 feet to the leeward by four-fifths. In other words, if a 25 mile wind was blowing, the force in the shelter of such a wind-

break would be only about 5 miles per hour. This reduction in wind velocity is equivalent to a reduction of 19 degrees F. in the cooling effect of the wind upon the skin. A French Experimenter, Vincent, has calculated that the cooling effect of a wind upon the skin is about 1 degree F. for each mile per hour increase in the wind.

ONE, TWO OR THREE ROW WINDBREAK

The space to be devoted to the windbreak need not be large. One row of the right kind of evergreens will give effective results. Two rows are better and three or four rows will make a windbreak which will be up to the standard which should be maintained on land that is worth from three to five hundred dollars per acre. Instead of considering the land occupied by a few rows of good evergreens as waste, the farmer must realize that the space thus occupied, probably brings higher returns in money, comfort and attractiveness than any other equal area on the farm. For this reason the land which is occupied by the windbreak should not be given over too grudgingly for this purpose. The windbreak is a business proposition and is a financial asset.

CORRECT LOCATION

The exact location of the windbreak with respect to the permanent improvement on the farm should be worked out with extreme care. Usually the windbreak is confined to the north and west sides of the farmstead, since in the central prairie states the severe winds are from the north and west.

BEST EVERGREENS TO PLANT

After the location has been decided upon, the next important thing is the choice of the best variety of evergreen to use. A fast growing conifer is always given a wide margin of preference. Hardiness also must be given attention. Only varieties that have proven their ability to withstand the extreme cold of the winter and the heat and drought of the summer, should be selected. There is also a question of beauty which should be given attention, since it usually is possible, from the list of hardy evergreens, to select a pleasing tree, which also has the other necessary requisites. Since the windbreak trees are for the purpose of breaking the force of the wind, a tree of heavy foliage is to be desired, one which branches to the ground and retains its

branches even though the trees are crowded and shaded somewhat.

THE BEST TIME TO PLANT

The best time to plant an evergreen windbreak is in the spring. After the spring rain and sunshine have removed the frost, the soil is usually warm and mellow, which is just the condition required for the planting of young evergreen trees. There is nothing delicate about any of the hardy evergreens, as they come from the nursery ready for planting in windbreaks, shelter-belts and hedges. If they get reasonable care in the planting, they are sure to live and thrive from the beginning. In spite of their natural toughness, it is important that every care is given in the planting and after care of the young evergreen windbreak.

The very name "Evergreen," suggests moisture. It is only at the moist points on the earth that green things grow. Such evergreens as I would recommend for planting in the northern states do not require an excessive amount of moisture, nor special cultivation, but the attention they do require should be given them without fail.

Do not use green stable manure for mulching, you may damage your evergreens if you do. They do not ask for much plant food, merely for an opportunity to send their roots down and about in a soil that is moist and not packed too solid.

If the ground is very dry, it is best to water the trees. As the trees grow older, they will shade the surface more and more and so will cover it with needles and foliage. The shade and needles make the natural mulch. However, as most windbreaks are only two or three rows wide, the conditions of shade and litter are not nearly so good as in the thick natural forest, and you had better apply more leaves, straw or decayed litter every two or three years, under the trees. Pine needles or forest leaves, are the very best mulch and should be used if you can get them easily. Be careful about fire while the trees are small, the burning of the mulch will surely kill them.

VARIETIES FOR WINDBREAKS

We are here today to consider chiefly the best evergreens to use for various purposes.

Of the many European species, we may discard a number that are not of any particular value. Generally speaking, I believe it is best to confine our prairie state plantings to as few varieties as possible, selecting only those which are suited to our conditions.

Evergreens are not particular as to soil. They prefer a light, sandy land, but will do well in any well drained soil.

FOR WINDBREAK PLANTING

Norway Spruce,
White Spruce,
Black Hills Spruce.
White Pine,
Scotch Pine,
Ponderosa Pine.

All of these pines and spruces are entirely hardy, rapid in growth and long lived, maturing into tall well-formed specimens.

HEDGES AND ORNAMENTAL EVERGREENS

Evergreens for ornamental purpose must be selected with reference to the position they are to occupy, the purpose they are to serve and their relation to the place where they are to grow.

For hedges and medium growing windbreaks, the American Arbor Vitae is recommended as the best. As a hedge plant it can be sheared into any desired form and is always green and attractive. As a screen or windbreak for the flower garden, vegetable or lawn, it has many points to recommend its use, mainly the fact, that it may be clipped along the sides and made to occupy as small a space as is necessary.

For grouping at entrances, near dwelling houses, and for massing in formal plantings, *dwarf evergreens are favorites*. They are always cheerful, in evidence and wide awake the year round. Among the best for this purpose are:

DWARF VARIETIES

Juniperus Canadensis.
Juniperus Procumbens.
Globe Arbor Vitae.
Japanese Yews.

The list of *Medium Large Growing Sorts* is more extensive, some of the most valuable being:

Hemlocks.
Silver Cedar.
Pyramidal Arbor Vitae.
Pfitzer's Juniper.
Concolor Fir.
Golden Arbor Vitae.

SOME TALL GROWING SORTS

White Pine.
White Spruce.
Douglas Fir.
Austrian Pine.
Black Hills Spruce.
Red Cedar.
Colorado Blue Spruce.

DISEASES OF EVERGREENS

The diseases of evergreens are comparatively few, and as a general rule, mostly confined to a few species, and restricted probably to certain conditions of atmosphere and soil.

TRIMMING AND SHEARING OF EVERGREENS

Many evergreens are spoiled through a mistaken idea of beauty, by having their lower limbs cut off, and thus forming a long naked stem, considered very distasteful to the intelligent evergreen planter.

The entire system of pruning an evergreen depends very much upon the same principles that govern the trees of other classes.

Most of the upright junipers, arbor vitae, hemlock and cedars are benefited by an annual pruning, either in early spring or late summer. Shorten the ends of all over luxuriant branchlets, thereby causing them to thicken and otherwise vastly improve in appearance.

When the leader or main stem of an evergreen becomes broken or destroyed by accident or otherwise, a new one can be readily formed by tying up a side branch in as nearly an upright position as possible.

Two leaders should never be allowed to remain. The stronger should be selected and the other cut away as soon as noticed.

As a general thing, don't be afraid to trim and prune your evergreens. Keep the knife on them constantly, proper and careful trimming will keep them to a well formed outline for years.

SUMMARY

In closing, I wish to say to you and to many other home owners, the economical and permanent improving of your property is a big problem. No matter how you look at it, evergreens will give your property an air of coziness and hospitality all the year round, which can be gained in no other way.

DISCUSSION

Q. Would you recommend the mulching of the windbreak when the trees are young?

MR. HILL: Yes, I would, if you do not intend to cultivate the windbreak. Young evergreens require about the same amount of cultivation as a corn crop, and unless you want to cultivate them and keep a dust mulch under the new windbreak for at least three years until the roots become established, you had better mulch it, and mulch it as quickly as you can after the trees are planted and do not be afraid you may put on too much mulch.

MR. ROE: What about trimming evergreens when they are planted when you get them from the nursery?

MR. HILL: Well, it is not advisable to trim the tree the same year that you plant it because of the double shock. The roots have already been disturbed, and the double shock of cutting the top is not good, as a general thing. The tree as it comes from the nursery will not require a great deal of pruning the first year, if it has been properly grown in the nursery. I would wait until they become well established.

MR. MOYLE: In these years that you have been growing evergreens, have you come across any new varieties in any line of dwarf trees, ornamental lines that you think have been of great value?

MR. HILL: Of course, the profits in the nursery business come from the love of the business, and the mission in life of the nurseryman is to try to bring out new varieties worthy of production, and the foreign nurseryman are always on the lookout. In fact, most of the good varieties that they grew in Europe were merely our native plants that we sent there and they were a little bit keener on selection than we were, and they would select out dwarfs and weeping and creeping things and forms. You perhaps have all heard of the Arnold Arboretum in Boston, Mass.,

the monument to horticulture in the United States, established by Professor Sargent, and where all plants are given a trial. The foreign travelers and the foreign arboretums and botanical gardens send all their plants to the Arboretum for trial. Professor Sargent wrote me some years ago and said, "I had a letter some years ago from Robert Douglas, of the old Douglas nursery at Waukegan, saying that in payment of a bad account a nurseryman of Omro, Wisconsin, had sent him a consignment of hemlock trees, and among those hemlocks was a variety that developed at the end into a large cone and retained its branches at the base of the tree at old age." This is not characteristic of the balsam fir, and he said, "Would you undertake to go up to Omro and see if you can find the original trees?" So I went up to Omro—this was in the '80s that this transpired, and I finally found a fellow who knew this nurseryman and said that he did not get his trees around Omro, he got them from around Sturgeon Bay, and I got a woodsman up there and we went out and we found the tree that he had in mind. It was in the group of plants that developed (it was just in the coning time of the year) long cones, and the long foliage. I merely relate that as an incident that is of interest, but of no particular value, because the balsam fir is not a high class ornamental tree. In Europe they have always made use of the Douglas fir of the Pacific coast. It is a rapid growing plant and develops into a timber tree in a surprisingly short space of time, but it grew so late in the fall that the early winter frosts got them. Then they followed the growing range of the Douglas fir up into British Columbia, up at the sources of the Fraser river, and they collected a lot of seed and took it back to Germany, gave it to the commercial nurseryman to plant it and distribute it to the growing stations, and I saw it over there and got its history and when I got back I sent to the government for government trading post addresses. I wrote to every government trading post station and I found the exact man I wanted and he was able to give me a few pounds of the seed. The foresters of Europe know more about the technical development of the American trees than we do in our own country.

MR. LIVINGSTONE: Can you give me any reason why windbreaks of Norway spruce die at the bottom?

MR. HILL: Of course, any evergreen when it is taken away from its natural forest conditions will naturally shed off its bottom limb, a process of elimination due to the shaded condition which that same evergreen had; if you put it on hard, dry ground and do not give it cultivation, do not give it a heavy mulch which reproduces the carpet of the woods, in its weakened condition it has to sacrifice some of the branches, and the first branches to be eliminated are those nearer the bottom of the tree; and that condition can be overcome to a certain extent by thorough cultivation, mulching and watering.

WHAT SHALL THE FARMERS DO WITH THEIR ORCHARDS?

A Symposium on the Farm Orchard, led by Prof. J. G. Moore, followed by Mr. Ernest Kreul, Mr. F. A. Brown and Mr. Stanley De Smidt.

There has been more or less discussion as to what our attitude should be regarding the farm orchard. There are two radically different positions which may be taken. One is that we should eliminate as rapidly as possible the farm orchard. The other is that we should bend every effort toward the redemption of the farm orchard.

In reply to the first position I have just one statement to make, and that is, that you can turn all the energies of the Horticultural Society toward the elimination of the farm orchard, and in ten years you will be just as far as you are now in eliminating it and no further, because you cannot dictate to the farmers of Wisconsin whether they shall plant trees or whether they shall not plant trees, and if I am rightly informed, they are going to plant trees. Now, that leaves just one other position for the horticulturist to take, and that is, that he should turn his energies into saving the farm orchard.

I have been interested in this subject for a number of years; I never attempted to make an analysis of the subject until very recently, in fact, I have not attempted to make any very thorough analysis of the subject at the present time, because unfortunately, we do not have sufficient data to make a general analysis, but I was able, a short time ago, through a conference that took place, and through the courtesy of Mr. Cranefield to get hold of the names of some 500 orchardists in the state of Wisconsin who have orchards of 200 trees or over. I cannot state just how full a list that is; I know that it is not complete, but it is fair to assume that all the larger orchards of this group of 200 trees or over have been reached.

Now, what does an analysis of that group of 500 orchards show? It shows that there are 27 orchards in the state of Wisconsin that have 750 trees or over, and I think it is fair to conclude that we have all of them. We have 63 orchards out of

this list of 500 that have 500 to 750 trees; we have 43 that have 400 to 500 trees; 37 that have 350 to 400; 82 that have 300 to 350; 59 that have 250 to 300; and 193 that have 200 to 250. That does not make quite 500, it makes a little more than 500, about 4 over, I think.

Now, this is a question I want to propound to you; How many orchards are there in the state of Wisconsin under 200 trees, and what percentage of the total orchards then are these few orchards, comparatively, which we have which may be called orchards? I am not able to say, but I think it would be a fair assumption, on the basis of the figures we have here, to say that at the very least we have 2,000 to 3,000 orchards in the state that go on down the list, probably between the 200 mark, we will say, to 50, it does not make so much difference how many.

My next point is this. If we are to advance Wisconsin as a horticultural state, as a fruit growing state commercially, where lies our best point of attack? To go out and try to convert the man who has started in orcharding into starting a commercial orchard? How far would you get, or where is the point of attack? To take this man who has a 200 tree orchard, or 100 tree orchard and convince him that fruit growing in Wisconsin pays, and it will pay him under proper methods.

Now, I have got the evidence, I am going to have it presented a little later, but I am going to cite two or three cases before I get through. A man up here in what we might call Northern Wisconsin, north of Green Bay, has a farm orchard in all respects as far as management was concerned, writes in asking for advice regarding his orchard. He has somewhere from 150 to 200 trees. Shall we write, "Cut your orchard down?" Or shall we tell that man, "Spray, prune, cultivate, take care of that orchard and it will make you more dollars per acre than any other two acres on your farm?" Well, we believed the second proposition was the better one, and we have a commercial orchardist in that town.

In Waukesha County, a man with two old run-down orchards from which, although he had lived there almost since he was a boy, he had never got an apple from some of the trees. Needs help; give him some advice, some encouragement, some help. Result, profitable farm orchard, commercial in almost every respect, even to the number of trees. Result, next year that man planting 40 acres of orchard, and he is a cattle man.

Now, that is all I am going to say on "What Shall We Do with the Farm Orchard." The point I want to leave with you is this, and then the evidence is going to be presented,—that it is high time, recognizing that it is commercial orcharding that we want, also recognizing that we have the farm orchard and we will always have the farm orchard, it is high time that we were getting back of the movement and helping these men and helping to spread the gospel of better orchard management among the farm orchards, so that we have the foundation on which to build a commercial orchard industry, and I believe confidently that that is the principal means by which we may become what we hope we will become and what we sometimes like to boast that we are becoming, a great commercial horticultural state from the standpoint of the fruit industry.

THE EVIDENCE

MR. ERNEST KREUL: I am only an amateur at the spraying business. Last winter at our community meetings the county agent brought up the subject of the home orchard; also brought a photograph of some apples that had been sprayed and not sprayed, so there were some that decided that we ought to start a home community spraying outfit. Well, it dragged along, we did not get started spraying until rather late; finally the agent sent a university sprayer, and we missed our pink bud spray, but we got in the sprays for the calyx, two sprays, the last spray in July. Then our fruit, most of it, was damaged by the codling moth to some extent, but that was because we did not spray at the proper time. We were rather green at the business; did not know how to go at it, then Mr. Keiffer came out, gave some instructions and then told us what to do to get good results. We did not spray as thoroughly as we should, but I should say one-third of our apples which were sprayed the best were not very marketable, about two-thirds were. Some of the varieties did not bear, some of the Wolf River did. We sold some of those; I should say we picked about 12 bushels to put down cellar, and we sold some for $1.50 a bushel. I think the Snow apples and Greenings should be valued at $2.00 per bushel.

Then I took a little time in the spring to do some pruning, pruned our orchard to the very best of our knowledge; then we sprayed and the time and expense was about one-half of what the apples were worth. Some of our trees we did not spray because they were in front of the bee hive and we were afraid of getting stung. Those trees that we did not spray, most of the fruit fell off in the summer and what stayed through till fall was not worth picking, was all wormy and had some scab on it

Then we sprayed some plum trees and some we did not spray. Those that we sprayed gave us a couple of market baskets full of plums; those that were not sprayed had none left to pick, they all fell off. We used to have lots of plums when I was a lad, but of late years they were so bad with the rot that there were few plums left. This year there was a good crop of plums, very little rot. Another party who had the community sprayer said that for years they did not have many plums on account of the rot, this year they had many bushels, with cherries the same way.

Now, I think it is time we got after the farm orchard. Most of the farmers are ignorant of how to take care of them, they need some one to show them. This movement will probably spread, as more communities see the results of what has been done. Keep the good work going, reclaiming old orchards.

In our old orchard there are some trees that are older than I am and still bearing fruit. There are farmers that would like to have lots of fruit, as long as they have trees they might as well have it and will if they take care of their orchards. Unless they grow apples to put down cellar for the children, they will not have any, because farmers are not likely to buy apples. What we need is men in the field to teach the farmers how to take care of the orchards. Most of the farmers have lived in the place 30 to 40 years, and lots of them use their orchards for calf pastures, which is very poor policy, and I think the time has come that we ought to make a change from now on gradually and see that the good work is carried on.

MR. F. A. BROWN: We have quite a large orchard that we never took much notice of, only to go through and cut down a dead limb, or something like that, until our county agent came out and said he would like to put in a spraying demonstration. I agreed, and we had a sprayer out there from the university, and I tell you that spraying has opened my eyes. We never had any apples to amount to anything. We have quite a good sized orchard. If it was a good apple year we had some apples, if it was a bad apple year we did not get any. This year we have apples to sell, and we have got lots down cellar. I think it is a good thing to put spraying demonstrations among the farmers, and I think we ought to do more of it.

MR. STANLEY DE SMIDT: The orchard on Spring Brook farm is a real farm orchard. It consists of over 200 trees, and my time is devoted to a herd of over 100 head of Holsteins, and as many Durocs, horses, etc., and you can imagine how much time I could devote to the orchard. Mr. Keiffer, when he first visited the farm, said, "Do you realize what you must do to get results?" I said, "Well, the orchard is here for us to take care of, and unless we take care of it right, it is not going to be here very long." So we finally proceeded to do some spraying, and we were out of luck to start with, by only being able to secure a

whitewashing outfit from a local concern, and got a man out there and he started the job at 15 cents a tree, and he worked the same as we all would, wanted to see how many trees he could cover in an hour. The first spraying did not prove successful. Finally Mr. Keiffer came to our assistance and showed this man how to spray, and the remaining four sprays were put on more carefully and a little more scientifically, and the final result was, we have had a fair crop of apples. Last year, 1919, we did not have an apple to put in the cellar in the fall, from 225 to 250 trees; there may have been a few, but the trees were so badly infested that we did not feel we wanted to try to store them, but this year I am pleased to say that we sold in the neighborhood of 200 bushels and we have a goodly supply in our cellar.

We are very much enthused over this project in horticulture and we hope it can be carried out. It is surely going to prove very beneficial in Dodge county, which was evidenced by the interest taken by the farmers at the Dodge County Fair. We had had inquiries from orchardists that really we owe to the display of our apples made by the Station or at the fair. The final decision of the Spring Brook farm is that we are ready to purchase a power sprayer for our own use and try to make a real orchard of our own, out of a farmer's orchard.

YOUNG MEN IN OLD ORCHARDS

MR. ARNO MEYER, Cascade.

(From Reporter's Transcript.)

I live in a section of the state that is devoted entirely to dairying. Every one of these old homesteads at one time had a large orchard which has gradually gone down to decay, until probably there is only one-fifth of the trees left. It is these old hardy trees that withstood the hardship of all these years that have appealed to me for aid. They have never received any protection from insect pests, diseases or decay.

My home is in the western part of Sheboygan county.

First, I rented some orchards of our very promising varieties and to these I applied a very thorough spray. My work was begun in the year 1916, and in order to carry the work along, I sprayed a few farm orchards as a side line. The following year I continued the work with about twice as many trees on the list. Then for the two years I was in service this work was neglected. Now, on my return there are so many requests to resume this

work, that this past season I have taken care of over 80 orchards, totaling a number at least 2,400 trees. To a great many people it seems there is a difficulty of securing enough work to occupy the entire time. If Mr. Keiffer were present he could verify that eight out of ten of our farmers are either spraying or willing to spray if they can get someone to do the work in this manner. I am giving them service which they themselves could not perform without neglecting their own farm work, and if this work were left to the farmers, at least 75 per cent of those who were willing to have the work done would not do it, because the orchards are either too small or their other work too urgent.

I cover territory of a radius of about ten miles. I have an equipment which consists of a large power sprayer mounted on a truck. With this machine I spray my own trees. The equipment is a large 3-cylinder sprayer, with a 200 gallon tank. I can carry 200 feet of hose to allow spraying in places inaccessible to the truck. At such times the drivers aid us in handling the hose. I use the 14 foot rod exclusively, all spraying being done from the ground. I carry a spray gun, but only use that in case of emergency when I break the rod. I find that the spray rod suits my work much better than the gun, because in spraying I cannot wait for the wind to change, that would mean 8 sprayings instead of 4, consequently I have to spray against the wind, and if any one has ever tried to spray against the wind with a spray gun I think they can appreciate the situation. These old trees average all the way from 25 to 40 feet in height, and when I take a contract for spraying I do not agree that I shall cover more than 20 feet above the ground, and the following season's pruning will remove that upper portion and they will be within range.

I use the standard spray materials, lime-sulphur and arsenate of lead, a gallon and a half of lime-sulphur and a pound and a half of arsenate of lead to 50 gallons of water. This will cover approximately 40 trees, that is, the 200 gallon tank. I make a charge averaging about $1.00 per average sized 35-year-old tree and this includes four foliage sprays.

Now, in regard to the pruning,—these are trees none of them under 35 years of age, and some of them probably 70, and from indications you would judge that these trees had never seen a pruning, the only branches ever removed being those that had

died and were easily reached, or those that were injured and removed with an axe. Some of them were nothing but a dense brush. Now, it is difficult to go up to a farmer and ask him to spend money for pruning, for dormant spray and foilage spray, because if he has 40, 50, 60, 70, or even a hundred trees, that would be quite an expenditure for him, without being absolutely certain of any returns, so the first season I only urge him to make the foliage spray. After he has once seen the results of these foliage sprayings, it is an easy matter to get him to request pruning and dormant spray.

Up there they take great pride in their farms and everything that goes with it, and they want their families to have the same fruit that they had in their boyhood days when we knew nothing of the worms and scab, when these trees produced fine, large, red apples free from all blemishes. It is quite different now; if they have any apples at all, they are nothing but small, green, knotty, wormy things, hardly fit to be called an apple.

Now, as far as the results go, they are clearly indicated by the enthusiasm of the farmer after three years' work. I have no definite data on the result of spraying farm orchards, but in my own orchards, which number four in all, my results this year were 25 per cent culls, and about 50 per cent of these culls were culls only because they were under size, only 25 per cent of them being blemished, so that would bring it around 12½ to 15 per cent. These orchards were sprayed as I came to them, the same as I did the farm orchards. One orchard I know was sprayed first, the other two some time during the intervening period, and another one was sprayed the last. Of course that is contrary to all spraying advice, but I venture to say that no one could say which one of these orchards had been sprayed first.

Besides taking care of these farm orchards I have 500 trees of my own, these trees are given the same care as any commercial orchard, excepting in culture. The results of spraying were certainly as good as many large growers have, and much better than the farmers can accomplish by their own methods of spraying with small hand outfits, the power sprayer being superior.

These 500 trees the past season have produced in the neighborhood of 1,400 bushels of apples. These apples were sorted into two grades, Fancy and A grades, and culls. The culls were immediately disposed of to department stores or dealers, sold in

large lots, second grade went either direct to the consumer or fruit stands. This year I got $2.50 a bushel for all my fall apples and early winter apples at the orchard, and $3.50 for the fancy apples. We have the market; all we need to do is to produce the fruit. Twenty-five per cent of the apples were sold right at home and people went right to the orchard and got them.

Besides doing this orchard work for the farmers there is great opportunity in developing landscape gardening.

After I get my spraying business operating right, I will drift over into that also because these farmers all have fine farm homes, all they lack is good orchards and ornamental planting. After you get farmers interested in these matters there would be no difficulty in securing their support. I have over 50 per cent of jobs booked that I had last year for spraying, and every one of these has asked that the orchards be pruned, and there are hundreds of these orchards all over the state that have promising possibilities. If a man will go into it with proper spraying equipment and spraying methods and good management, he cannot help but make a success.

SUMMER MEETING

OF THE

Wisconsin State Horticultural Society

Chamber of Commerce Rooms,
Racine, Wisconsin,

Wednesday, August 18, 1920, 10 o'Clock A. M.

PROCEEDINGS

The Convention was called to order by Secretary Cranefield.

SECRETARY CRANEFIELD: It may seem to you rather a strange proceeding, for the convention to be called to order by the Secretary. To most of you no explanation is necessary, but for the benefit of the others, I will say that through force of circumstances the perfectly good president whom we elected at our convention last year, has been compelled to resign, and has left the state. Last evening we made our acting president, Mr. Hays, President of the Society. It is absurd to offer any introduction, so I simply present to you at this time our president, Mr. Hays, who will now conduct the meeting.

PRESIDENT HAYS: Ladies and Gentlemen: I thank you very much for your kindness. I am not a public speaker, and have never made a speech in my life, and I think too much of this audience to inflict a maiden effort upon it. We will simply start out at once with our program.

H. F. Koch of Kenosha, is the first man on the program, and he will now speak to us on "Outdoor Rose Growing."

OUTDOOR ROSE GROWING

H. F. KOCH

(From Reporter's Transcript.)

Mr. Chairman, Ladies and Gentlemen: I am certainly very glad to be here. When I received a letter from your Secretary, Mr. Cranefield, requesting me to say a few words to you on outdoor rose growing, I must admit that I was very much surprised; and it goes without saying that I very much appreciate this honor. A talk of this sort before an organization of this kind is such an entirely different matter from those to which I have been accustomed, that I feared I might not do justice to the subject, but I was very much interested after noting Mr. Cranefield's statement that many of the members had utterly failed in outdoor rose growing. So when I came home that evening and saw the wealth of bloom in my garden, the June roses, hybrid teas and climbers, both large and small flowered varieties, well set with buds about to open, I felt it was a duty, that I owed to lovers of roses, to come here and tell you what little I knew about them.

Prior to the time I personally planted my first rose bush, about ten years ago, I was only an amateur, with no experience whatever in horticulture. At that time I bought a few plants at one of the Milwaukee department stores, but I did not know one rose bush from another, except that one was supposed to be red, another pink, another white, and so on. I soon found that the rose as a plant responded quite readily to cultivation, and appeared to be very grateful for whatever attention it received. Feeling rather encouraged, I absorbed whatever knowledge I could obtain from catalogues and books on roses, and particularly from other amateur growers, wherever I could find them.

To grow outdoor roses successfully there are two requirements which I consider essential. First is in the preparation of the rose bed proper, and second, procuring the right kind of stock or plants. It has been said that it is better to put a ten cent plant in a fifty cent hole than a fifty cent plant in a ten cent hole. This is especially true of roses.

First, with reference to the preparation of the bed. My place is about half an acre in extent, and by continuously changing around I found certain spots where the roses did better than other places, which, of course, was somewhat important to know. Then in making the bed I like to do the work myself. I could have it done for me, but it is a great pleasure to me to do it myself, even though it is hard at times; and the pleasure of doing it, and the improvement in health that such outdoor work always brings about, make a great incentive. When I make a new bed, which I will do again this fall, I excavate at least twenty-four inches, putting the top or surface soil on one pile, and the subsoil on another. Of course, on my place it is not necessary to make a trench; my place, fortunately, is well drained. That is important to consider, for the experience of some friends of mine, who made their beds in a place that was too low, was that they usually lost their plants during the winter. A rose does not like wet soil. After digging, I return the soil, first mixing it with at least fifty per cent good fertilizer, cow manure being preferred. There is no question about its being the best. I mix about fifty per cent with the subsoil and the surface soil, and I usually like to get a good clay loam. The clay seems to give the roses better color, and keeps the roots cooler in summer, and in that way gives much better results. Then I fill the bed up two or three inches above the level of where it is supposed to be, and eight inches below that I have no fertilizer of any kind, the idea being to force the roots to go down deep for their sustenance. Having too much nourishment at the upper part seems to tend to make the roots grow more toward the surface. That is a very bad thing, when it comes to keeping them through the winter. That is an important matter to bear in mind, and you should pay particular attention to it. Then finally, I take powdered bone meal, some very fine, some a little coarser, and some very coarse, and see that it is well sprinkled throughout the soil; not too heavy, but just sufficient so there is plenty of nourishment for some time to come.

In this connection, do not forget the lime. That is very important. It sweetens the soil and improves it, and you can very readily tell the difference between a plant where there has been no lime, and a plant which has had lime. I prepare the lime in this way: I put it in a basin, pour water on it, and let it disintegrate, so that takes on a very finely powdered form. Then I

sprinkle it on, and do that two or three times a year, that seems to be sufficient.

Now, as to the kind of stock. I have had some very sad experiences along this line. Some of the nurserymen in their catalogues lay special stress on own root stock. That is the biggest humbug that was ever perpetrated on the American rose-growing public. I am not interested in the matter, either; it is immaterial to me. I am simply giving you my unbiased opinion. I am not interested in any nursery at all. I am simply giving you the actual facts. I have talked with a number of amateur rose growers, and they all had the same experience I did. To satisfy myself which of the two really gave the best results, last fall I had one bed of probably fifteen Hybrid Teas, and they seemed to do fairly well the first year; but I was not quite so well satisfied the second year. The growth was not so vigorous as it should have been, so I dug them up. They were on their own roots, mind you. I was very much disgusted to find little tiny dangling roots in nice, good, rich soil. To complete the comparison, right next to them I had some other Hybrid Teas which I dug up. They were budded plants. I had to go to some depth to get to the bottom of the roots. I believe in the case of one plant I went down something like three feet.

Now, that indicates pretty plainly that the kind of stock you plant should be budded stock. Unfortunately it is going to be hard to secure sufficient budded stock in this country. You probably all know that the Department at Washington issued what might almost be called a restraining order against the importation of foreign stock, on account of certain diseases concerning which apprehension is felt. We do not want to take a chance on getting them into this country, so I presume they know what they are doing, and I believe they probably are right.

There is no reason why the American rose growers should not begin to produce their own stock. Of course, you understand it takes some time to grow stock for budding from seed. I cannot speak from personal experience along that line, but I have a friend who knows the business and is well trained in it,—an European—and he told me only a few days ago that it required something like two years to germinate a rose seed from wild stock; and of course that means another two years before you can get a size which is large enough so that you can bud it.

Whereas, with own root stock, all you need to do is to make the cutting, stick it in sand, be a little careful of it, and in a week or two you have roots. Then put them in your hothouse, and in another year you have the so-called two-year plant. That is one of the main reasons why they advertise own root stock as they do. There is no question about it.

As far as the flowers themselves are concerned you will find that on own root stock you will get one or two flowers. The plant will throw probably three or four more buds, but the first thing you know, you have bud rot. They do not mature. That is undoubtedly due to the fact that there is not sufficient nourishment there to mature the flowers; whereas, with budded stock, I have had twenty-five and thirty flowers, every one maturing; some that were full size, and almost perfect, I might say, for outdoor rose growing. Now, that to me is pretty clear evidence. You cannot get away from it. It stands to reason that the budded stock is the thing, especially when all of the amateur growers —I am not speaking of any professionals—tell you the same thing. Wherever they possibly can, they will buy only budded stock.

Of course, there are exceptions. Some of the more vigorous growing kinds will do fairly well on own roots after some years, but that means a wait of three or four years. I have two plants of a particular rose, Hybrid Tea, one on budded stock, and the other which I raised from a one-year cutting, bought from an Eastern nursery. It would do your heart good to see the flowers on the budded plant, and when you compare them with the flowers on the own root plant, the comparison is most impressive. If you took the own root plant by itself, you might think it was very fine, because it would be really good in a way; but it would be nothing as compared to the flowers on the budded stock.

Now, the next thing of importance that I have found is the problem of how to winter roses in Wisconsin. You all know that our climate is severe, and during January we usually have the so-called January thaw. That is something that must be guarded against, because if moisture gets on the roses during the winter months, it is apt to be fatal to them. I have developed a plan. The suggestions concerning this plan were given to me by another grower, also an amateur. Toward the end of a season I stop cultivating, so as to discourage all new growths. This will ripen the wood. The riper you can get the wood, the

better it will go through the winter. The Hybrid Perpetuals I usually tie up, and wherever I possibly can, where the Hybrid Teas are not too vigorous or too tall, I bend them over gently. You can do it if you have a little patience, and they seem to stand it without very much trouble. The Climbers, of course, present a rather difficult problem. I take them down, and sometimes it takes a great deal of pains in order to get them to lie perfectly flat on the ground, especially if they are old plants, where the canes are apt to be stiff. Then I start to cover them with soil. I have found that soil is really the only thing that you can rely upon. Sifted ashes are no good. Good soil seems to be the thing. I take the Hybrid Perpetuals, and just simply hill them up as far as I can with such soil as I have to spare. The Hybrid Teas I cover entirely, and I cover the Climbers as far as possible. I cover the Climbers just as deep as I can, and I bury the Hybrid Teas deep. I usually do this right after the first frost. I wait until we have a frost, a fairly heavy frost. This I notice has a tendency to ripen the wood. After that I take them down, and keeping the soil loose so that I can work it, I take the loose soil and cover them.

Now, in order to have enough soil I have made an excavation which I dug out a couple of feet deep, some thirty inches, I think, which gives me ample soil. I take the soil out of that, and I have plenty of soil to cover the roses just as deeply as it is necessary to cover them. Then I wait until we have a real hard frost, and when this frost comes I have plenty of litter, and straw, and my boys usually see that I have plenty of dry leaves. These are placed on top of the bushes. In the last year or so I have taken tar paper, so as to exclude the possibility of moisture getting through, and used it there; but I only do that on the Climbers. It is not necessary for the others. If your Climbers get a touch of frost, and the bark is destroyed anywhere along the cane, from that point on your cane will die off. With the finer kinds, especially those that have a little Tea blood in them, instead of flowering, they will immediately start and throw out new canes. So if that ever happens to you, you might just as well cut it right off there, because then whatever canes you have left to flower are just so much the better. I have had experience, and I would not believe it at first, but I had the experience again this spring.

Probably you are familiar with the Dr. Van Fleet rose. This particular Climber that I referred to had about five or six canes, some fifteen or eighteen feet long. One of the best canes had some moisture get in about half way up the length of the cane, and I had to cut it off. The balance of that cane, instead of flowering, began to throw out new shoots, which of course do not flower, because climbers flower, with one or two exceptions, on the previous year's growth. Now, if you should have that same experience, cut it off, because you will have just so many more flowers on the other canes that remain, if you do. There were three other canes, as I recall it, on this rose of mine. I counted the flowers on one of them. I stopped at 125. Every one of them was a nice, fine looking flower, probably three or four or five inches across when fully expanded. I do not know where you could find anything better than that for out-of-doors. That was the result of covering the climbers during the winter. Before that I took some of the advice of the rose books, which said that this climber was perfectly hardy. That is not so. It is not hardy in Wisconsin. It is hardy only to a certain extent. I was told the other night that in Europe, where the climate is much warmer than here, the practice is made of covering roses with soil throughout the winter. Why should we not do it here, where they have to stand just so much more?

Now, about uncovering. That is something you will have to learn. You have to uncover them just at the right time. If you uncover them too early, they are apt to be injured by late frosts on the new growth. If you do not uncover them early enough the roses—especially the climbing roses—will throw out new shoots, which make large flowers; and if the snow then gets at them, of course they dry up. So you have to find a happy medium, and uncover them just at the right time. I usually find it best to uncover them a little early, and take a chance on the weather. For that reason I leave the climbers on the ground for a day or two, or a week, if necessary. And if by some chance we should have a real heavy frost that might injure the plants, or the new growth, I have some handy material there that I just simply throw over the plants in the evening before I retire. In that way I brought through about twenty climbers, I think, this year, and probably six or seven perpetuals. The beauty of the climbers is that some of them start early, and the last of them

are through about the first of August. You have your climbers for quite a long time. Some of them were small flowers, and some of them were large flowers. The large flowers are really the best, except the Dorothy Perkins. That is a very fine plant, very responsive to attention, and very hardy, too. You can almost take a chance there, if it is not exposed to the winter winds, as I have found with them in several locations, where we left them standing up, that they came through the winter in good shape. But occasionally you will lose them if you do not take the precaution of laying them down.

Now, pruning is something that you must learn from experience. I find that the more vigorous the plant is, the less it should be pruned, which is the opposite from what you would suppose. The weaker the growth, the harder the pruning, if you want results. A vigorous plant, when it is pruned hard, throws very few flowers. I tried it this spring on a particularly vigorous plant. After it was through flowering, I cut it right down to the ground, and instead of getting good, heavy canes as I expected, the same as I did the previous year, the canes that did come up were small and not as strong. Of course, the plant will recover, will probably be so much better the year after next; but next year I do not think I will have very many real flowers.

Some people seem to experience considerable trouble with disease. You will find that you will have very little trouble with disease if your roses are properly planted, and are the right kind of stock. Own root stock seems to suffer more readily than budded stock. That is easily explained. They are stronger and more vigorous, and do not have to fight for existence, and disease does not get hold of them quite so readily. The one thing that does trouble everyone, more or less, though, is mildew. I have been using a lime-sulphur solution. Whether it really has the effect that is claimed for it or not, I have not fully satisfied myself; but while the plants are dormant, I take the lime-sulphur solution as directed, and spray the plants well, and soak the soil well with it. As a matter of fact I have not any mildew now, come to think about it, where I did have it before. It is a preventive rather than a cure. Of course, there is a cure, and that is by spraying with potassium sulphide. But with potassium sulphide you have got to be pretty careful. If you use it a little too strong, the leaves drop off. That is not due

to the fact that the leaves cannot stand it, but because the leaves are diseased, they will naturally drop off. I have tried it. I took a good bush, a perfectly healthy bush, and sprayed it with the usual mixture, and it did not seem to affect it at all. I had a Dorothy Perkins Climber on which the mildew got a little the start of me, and I sprayed it, and the next thing I knew, the leaves began to drop. Of course it did not affect the flowers any, because I got at it quickly enough.

I usually give them about one spraying of Bordeaux mixture. The only thing is, do not buy prepared liquid Bordeaux mixture. It is absolutely no good. My chemist tells me that a prepared Bordeaux in liquid form loses certain properties of destroying harmful germs and other things of like nature which infest the rose bushes; but the powdered form for the average amateur is all right. It is not as good as that which the horticulturist prepares himself, but it is still good. This information was given me by a chemist who is a thorough student of the subject, and should know what he is talking about. I have found it to be a fact myself, because after he told me that I discarded the prepared liquid Bordeaux, and now buy a powdered form.

Of course, you have to combat insect enemies. There is no getting away from that. They are almost everywhere. There are two kinds, the sucking and the chewing or eating. The eating kind is very rapidly disposed of, if you get up early. Take arsenate of lead in the ordinary powdered form, and mix it with your Bordeaux as you begin to spray, and that will do the work; there is no question about it. And the chances are that you will not be troubled until possibly toward the end of the summer season, when the plants begin to make roses for the fall blooming.

The Aphis present a problem also. They are very persistent, and you will have difficulty oftentimes if you do not get right after them the minute you see the first one. They multiply so fast that as fast as you kill them off, more seem to spring out of the ground. I do not know where they come from, but they are there. This year I was a little bit slow getting at them. I was out of town for a day or two, and when I came back I found that my plants were full of aphis. I have been after them ever since, and I am just about getting rid of them. It is just possible that they are more persistent or numerous this year than ordinarily. I do not know. Of course, seasons change.

Black Leaf Forty is good. Formerly I was able to get a solution called Nicotine, but I understand that is out of the market now, and not to be had. I was told that it was mislabeled, or misbranded, and the Government, as usual, stepped in and stopped its sale. That other preparation was better than the Black Leaf Forty. Then again, I use tobacco dust, cover the ground, or lightly sprinkle it over the ground. I did not do it this year, however. It has a tendency to choke the aphis. The main secret of getting rid of them is to get at them good and early. That is almost all that is necessary. If you do that, you will not have very much trouble.

Now, about planting time. A good many growers seem to advise—that is, a good many nurserymen seem to advise—spring planting for Wisconsin; I believe that is a mistake. The best success I have had was from fall planting, strange to say. The plants seemed to go through the following winter better than the plants that were planted in the spring the year previous. Those plants did not seem to get a good start, even though I gave them an unusual amount of care. The situation is this, that the warm weather comes on very fast, and we really have very few spring days here; one day it is cold, and the next day it is hot, and from winter you might almost say that we go into summer. That is the reason, I believe, from my experience, that fall planting is advisable. The plants have a better chance. A rose will grow in cold weather. They set better, and you can buy better plants in the fall, which is also an incentive. If you wait until spring and order them, the chances are they may arrive very late, if not too late, for the plants to get a good start, even though all other things are equal. One of my friends has always made it a practice to plant in the fall. He has been very successful, and as the result of his experience I have changed from spring to fall planting.

Now, I believe that what I have said covers all of the essentials. Of course, there are a few other little things that must be taken into account, one of which is not mixing up the varieties too much. And you do not want to plant a very vigorous plant in front, and a less vigorous one in the back, and things of that kind. Try to keep the varieties separate, if you possibly can. It is better, and you will have better results.

Now, it may seem from what I have said that the requirements of outdoor rose growing are somewhat exacting. However, this is not at all the case, and the work of caring for the plants extends over the entire growing period, and when you consider the results obtained and the fact that you can have roses in bloom from spring until freezing time, you can readily see that the care and attention that it is necessary to give the plants are well worth while. Right here in Wisconsin—not alone in the southern section, but also in the northern part—I have seen roses growing and blooming to perfection. I have seen them as far north as Marquette, Michigan. The blooms which I saw at Marquette were very fine, and about as perfect as produced by the professional hot house grower.

The climbers grew to a length of from twenty to twenty-five feet. They were planted in sandy soil, which is all the more remarkable, as roses are supposed to give the best results in heavy clay soil.

I have seen roses in bloom in the south, and in the east, and various other sections of this state; but the finest blooms of hybrid teas I saw at Lake Nashota, hybrid perpetuals grown by a friend in my home town of Wauwatosa. My roses are a constant delight to me, from the time the first flowers scent the atmosphere with their wealth of bloom, and then along through June and July—the climbers, large and small flowered, each in its turn, and the hybrid teas—until they cease blooming in the late fall because they must go into winter quarters to rest for the bloom which is sure to follow in the coming spring.

DISCUSSION

MR. CHRISTENSON: If you were going to grow one kind, perpetuals, hybrid teas, or something else, what class would you select? Most of us cannot have very many, and we would possibly only want one class.

MR. KOCH: If you are satisfied to have roses simply in June, and a sprinkling of them in the fall, select any of the hybrid perpetuals that are recommended.

MR. CHRISTENSON: You said something about budded stock. Is there not a danger that most amateurs may get into some trouble with growth from below the bud?

MR. KOCH: I thought of that, and I am very glad you brought that up. You can very readily detect the "stock" or

growth which starts from below the bud. It is very thorny, with small spines. If the minute one of these sprouts appears you dig right down and cut it off close to the stem, you will have no trouble. You may have to do that once or twice, but after the plant is in the ground several years I do not believe you will have that trouble at all. I have had it only the first year or two, until the top part was thoroughly established. You can readily detect it, and after you once know it you will never forget it.

A MEMBER: What is your suggestion about the proper depth for planting?

MR. KOCH: You do not want to plant too deep. Plant just about as deep as, or a little deeper than, the plants were as they were set in the nursery. Planting too deep is not good. It is apt to cause the upper stem to rot off.

SECRETARY CRANEFIELD: How do you protect the fall set plants?

MR. KOCH: Just the same as the others. There is no difference. They have a covering of from ten to twelve inches of soil, and then on top of that a quantity of leaves, litter and straw; whatever I pick up.

MR. LANG: Is it necessary to put in sub-drainage?

MR. KOCH: On my place, when I began, I found that I had a certain amount of depression; that is, my back line was somewhat depressed, probably eighteen or twenty inches deeper than the surrounding part. I started, and as so many do, to put them in the middle, to give them plenty of sun, as I was advised to do. But that place was low, and I soon found after a year or two, that they did not do so well, so I took them away because during the winter water accumulated there. I planted them on a little higher ground toward the north side of my house. It is absolutely necessary, if your place is moist, that you provide drainage, otherwise they certainly will be winter killed. That has been demonstrated many times. A friend of mine who is certainly an enthusiast, who spends all his spare time with his flowers, a man of very artistic temperament, loving beautiful things, went to no end of expense in preparing his rose bed. He has a wonderful garden; an Italian effect on a small scale. He started to make his rose beds, and he made three or four of them, and did it all himself, and he put them in a low place. I told him, "I am afraid you are going to lose your roses during the winter." He said, "I will take good care of them, and nothing will happen to them. I am going to cover them, to build a house over them, and I will see that they come through all right." Well, he planted in the spring, and the plants were received rather late. They did not get quite as good a start as they should have had. Then in the fall he covered them well. He built a regular shed

over them,—which was unnecessary, of course, and when he uncovered them in the spring they had all rotted off. Out of about 35 or 40 roses I think there were three or four left. Those are blooming today, and they certainly are doing very well, but there is danger that they will also die as long as they stay there, for whenever a thaw occurs, water is liable to get in.

MR. WILSON: How far apart do you set the roses in the bed?

MR. KOCH: That depends on the variety; with the Hybrid Perpetuals, usually about two feet, or possibly a little more. I like to have them fairly close together, for the reason that it keeps the ground cool. You spread them too far apart, and you have to work around too much, and I really find the other way better. With the Hybrid Teas, of course, you can plant them about fifteen inches apart; but with the climbers you should have at least a good three feet between them. Otherwise they will take nourishment away from each other, and they will not do quite as well as they should.

MRS. STRONG: What time in the fall do you plant roses?

MR. KOCH: Just as early as I can get the plants. I have been usually able to get them early in October. They make a root growth, and that is just what we want.

MR. CHRISTENSON: About pruning; how severely do you prune? Usually most amateurs do not prune severely enough.

MR. KOCH: I have two or three eyes on each cane, and no more; and if that particular wood is not good and strong and healthy, I cut it down still further. You must remember that pruning is the life of the rose.

MR. CHRISTENSON: Do you prune them closely when you set them out?

MR. KOCH: I do not believe I pay much attention to the pruning of the plants as I get them from the nursery in the fall. I think I leave them just as they are. I do not remember just what I did before, but I would judge it does not make any difference, because the plants, as you get them from the nursery in the fall are about right, if you buy two or three year old plants. Of course, if you buy very small plants, on their own roots, that is different. I have been a little bit ambitious, and I tried to see what I could do with hybrid tea climbers in this climate. I ordered several hybrid tea climbers which are supposed to be very good, and this particular nurseryman said, "We have not any two-year-old plants, but we are sending you one-year-old plants." When they came—they cost 35 cents apiece, but it was not a question of money,—they were about two or three inches tall, just little slips that had been stuck in sand, and just rooted. Now, you cannot expect much from such plants.

THE PEONY AND THE IRIS

T. A. KENNING, Minneapolis, Minn.

(At Summer Meeting, Racine, August, 1920.)

(From Reporter's Transcript.)

Usually when a man or woman starts to grow flowers, they want to grow all the kinds of flowers that they see between the covers of seed catalogues. Each one seems more lovely than the other, and the catalogues present them so attractively that they want them all. They try a good many of them, and they find that some are not adapted to their particular locality; that some are rather finicky, and need especial care; some are not hardy, and some grow like weeds and look like weeds On the other hand, they find that some are adapted to any locality, and respond handsomely to whatever attention is given them. Now, such flowers are the peony and the iris.

When a man or woman gets bitten by the peony or iris bug, so to speak, they want to talk to somebody else about it, and they want to learn more about it themselves, and they want to get a good collection of peonies and irises, and they want other people to grow them. So they hunt up other enthusiasts, and then they decide that the best way to disseminate the knowledge of and love for their particular flower, is through an organization. Thus it was that four or five men gathered together in Minneapolis about five years ago this last June, and organized the Northwestern Peony and Iris Society. There was an American Peony Society, but they held their exhibitions in the east, and it was hard for the growers and enthusiasts of the northwest to exhibit in competition with those who were nearer at hand. Among those men who organized this society were the late Rev. C. S. Harrison, C. J. Traxler, of Minneapolis, A. M. Brand, of Faribault, and W. F. Christman.

It is a curious but sad fact that two of those men subsequently became blind. Rev. Harrison before he died became blind, and one of the last things that his gaze rested upon was one of Brand's peonies, I think it was the Mary Brand; a very fine,

red flower. He said it was the very finest red peony in existence, and he was quite an authority. Mr. Traxler is now also blind, and it was a pitiful sight at our last peony show to see him being led around by his daughter, she trying to explain the exhibits to him.

The object of the Northwestern Peony and Iris Society is to disseminate the knowledge of and love for the peony and iris, and this is done in a number of ways. Each month the secretary has a department in the Minnesota Horticulturist, and in the Flower Grower. The members of the Northwestern Peony and Iris Society are also members of the Horticultural Society, and get the monthly publication, the Horticulturist. The secretary also issues a bulletin from time to time. We have had so far only two meetings per year. One of these is the annual meeting, which is also held in connection with the Minnesota Horticultural Society, where we have papers and talks on the peony and iris, and usually an illustrated lecture. Then in the summer we have our peony show. It is supposed to be an iris and peony show, but you cannot exhibit those two flowers together very easily, because your irises are gone before your peonies are in their very best condition. But this is also held in connection with the summer meeting of the Minnesota Horticultural Society, and we have to govern their desires. These shows, of course, are great forces of education. This last year, because of the fact that it is impossible to exhibit the two flowers together, satisfactorily, some of us decided that we wanted a separate iris show. I have the honor of being regional vice president of the American Iris Society, and so the American Iris Society and the Northwestern Peony and Iris Association co-operated in having this show.

Now, here is just a suggestion that I want to leave with you. I went to one of our biggest banks in Minneapolis, the Northwestern National Bank, and asked them if they did not want to put on an Iris show. Well, they rose to the occasion very handsomely, and said they would. They saw in it a chance to advertise their bank in a very effective way. So we put on an iris show. The bank advertised it in the papers very thoroughly—in the daily papers—putting in paid ads. We had the first iris show that has been held in the northwest, and it certainly was a revelation not only to the bank officials, but to the general public

as well. Hundreds of people came there with their note books and took down the names of the irises. Before that they did not know there was such a plant as the Iris. They thought they were just blue and yellow flags, but they found out that they were really fine flowers. The bank gave a silver cup, in addition to the money which they expended for advertising. Now, as I said before, I leave that with you as a suggestion. You can probably do something of that kind in your own town, and have a splendid show, without its costing you a great deal.

THE IRIS

The iris is native of a great many countries, and there are a great many species of iris, although we are concerned mainly with only a few. There are three main classes of iris: the bearded; the beardless, and the crested. The bearded irises are divided into three main classes: the dwarf bearded, the intermediate and the tall. Now, the dwarf irises bloom in April. They are doubly welcome, because they come so early. They come in a number of different colors. There is a beautiful blue, a white, and a yellow. They are very fine for bed edges, borders, because they grow very low. Then there are the intermediate irises, which are intermediate in height as well as in time of bloom. They are a cross between the dwarf irises and the tall bearded irises. There are a number of very good kinds in the intermediate. Ingeborg is a pure white, a large flower, very fine. Helge is a lemon yellow. Walhalla has lavender standards and light purple falls, a very large flower, very conspicuous, and very fine.

I am only going to give you a few of each kind. You may want to take notes, but if you do not, I may be able to give you some names after the meeting.

The tall bearded irises are what we have been in the habit of calling the German Iris. Linnaeus, the great Swedish botanist, gave them the name first, because they resembled the Iris Germanica, or the Species Germanica; but the German Iris, so-called is not a native of Germany. For that reason we are beginning to discard that name, and there have been a number of other names suggested, such as Liberty Iris, Fleur-de-lis, etc.; but tall bearded iris seems to fill the bill better than any other, because it is descriptive. If we call them Fleur-de-lis, that is somewhat incon-

gruous, because the flower is not a native of France, and it does not harmonize; and expressions with Liberty in them have been overworked. The description Tall Bearded Iris is I think the best of any, and I think that gradually all the growers will catalogue it as such.

Now, this is the main class of irises that we are interested in. There are in this class a large number of very fine varieties, enough to stagger you and confuse you. I am only going to give you a few, some of the best, low priced varieties. In fact, there are not many high priced Irises, because they multiply rapidly, and you can get good irises for a small price. In the past the tall bearded irises have been classified according to the color of the standards, but there has been so much intermixing of varieties that lately that has not been a very satisfactory classification, and some growers are discarding it. But we use it today to a certain extent.

Of the white, those having white standards, there is Mrs. H. Darwin, which is a very fine iris. It has white standards, and the falls are veined a little with violet. It is quite a compact growing iris, and a very free bloomer, and a very satisfactory all around iris. Then there is Victorine, which is very striking, white standards with a clouding of purple, and purple standards clouded with white. You see, they have gone fifty-fifty on the standards and the falls. It is a very striking iris, and a very fine flower. Then there is Rhein Nixe, which has purple falls with white edges. It is also a very striking iris. Then there is Miss Wilmott, which is a pure white flower of very leathery texture, and one of the best pure whites that there is. Both the standards and the falls are white.

Aurea is a rich chrome yellow with a little tinge of pink in it, which makes it a very fine flower. Mrs. Neubronner is a little darker shade. That is also a very fine dark flower, an orange yellow. Sherwin-Wight is also a good yellow, but not quite as good as the other two. Iris King is a cross between Iris Pallida and Maori King. Maori King is one of the most brilliant irises we have, but is a dwarf grower. Iris King has lemon standards and maroon falls, bordered with yellow. It is a very strong grower with a large flower. A very odd and striking Iris is Eldorado. Eldorado has yellowish bronze standards, shaded heliotrope. The falls are purple with a yellow throat, and yellow down the sides.

Then there is Jacquesiana, which is an iris with clouded bronze standards. There are a number of striking irises in this group, and Jacquesiana is one of the best. The falls are crimson-maroon. Prosper Laugier is larger and brighter than Jacquesiana.

In the purple standards we have Kochii, which is a claret purple, self-colored flower, that is, both the standards and the falls are the same. It is one of the indispensable irises, and very cheap. It is rather low growing and early flowering, but a very good one. Then we have Monsignor, which is a very striking iris, and one of the best. The standards are pale violet, and the falls are the same color, overlaid with a rich purple. Words can hardly describe this iris. It is a very tall, beautiful iris. Archeveque is a deep purple in the standards, and the falls are red and purple. That is one of the new good ones. Alcazar is another very fine iris with light violet standards and deep purple falls. I know this is a good iris, because I have had to take second place behind it in the last Iris show. It won first prize in the class for the best individual blooms. Madam Pacquette is a claret color, and has a very fine fragrance. Now, that is something which is not spoken much of in catalogues. I do not see why it is not dwelt on more than it is. The iris has a very fine fragrance. Madam Pacquette smells like grapes. Nearly all irises are very fragrant.

In the lavenders and pinks we have first Pallida Dalmatica. This is one of the old standard irises, and perhaps if I had only one iris I would want Pallida Dalmatica. It is a very fragrant and very tall growing large flower of a beautiful shade of lavender. Her Majesty is a rose pink. The falls are shaded or veined with a deeper color. Red Cloud is one of the newer irises. The standards are rosy lavender-bronze, and the falls are of a rosy crimson. Queen of May is another pink iris; it is perhaps the pinkest iris we have. It is a rosy lavender, almost pink.

Then there is a group of irises that are frilled, called the Plicata group, and the standard iris for many years in that group was Madam Chereau. Parisiana has white standards, dotted lightly, the edge, and a very fine iris, although it is one of the older varieties. Ma Mie is an improvement over Madam Chereau, of very much the same color, but larger and a little more striking than Madam Chereau. Parisiana has white standards, dotted lightly, and the falls are frilled lightly with purple. It is another very striking iris in the Plicata group.

Now, this group of bearded irises, contrary to the ideas of a lot of people, does not want to be grown near the water. The bearded irises like to have their roots baked during the summer time, and they should not be grown where water will stand in winter, for instance, and rot them. No manure should be put upon them in winter. They are perfectly hardy, and they do not need any covering at all. If you have just planted them out, perhaps it might be well to put a little rough covering of some sort over them the first winter. I use gladiolus stalks and corn stalks, just to hold the snow. But if they are established plants, they do not need any at all. You are less liable to have rot that way. That is about the only trouble that you have with the iris. Cover them too heavily, and they will rot.

The beardless group, the Apagon group, like to be near the water, although they will do well in a dry situation. There are a number of species in the beardless iris group, but there are only a few of them that I will mention. There is the Siberian and the Japanese. The Japanese are rather difficult, and we will pass them by, although some people have great success in raising the Japanese. But the Japanese have to be well covered in winter, in order to come through and bloom. The bearded irises like lime. You can use either air slacked lime sprinkling it on or you can use the ground lime stone. The air slacked lime is the quicker acting, but the results disappear more quickly. The ground limestone is slower in its action, but the results last longer. The beardless irises do not want lime. The lime for the bearded iris is a fertilizer, but another good fertilizer for beardless is bone meal, which has been mentioned here before today. The leaves of the Siberian iris are more slender than those of the bearded, and the flowers grow on a more slender stem. The Siberica are small flowers, of a deep violet blue, light blue and white.

Orientalis is a larger variety that has been discovered in China, and has larger flowers. Then there is Siberica Orientalis, Snow Queen, which is a white variety with large flowers, and a very good one. A gentleman in Minnesota has a light blue color which he calls True Blue, which is a very fine variety, and can probably be purchased from almost any nursery. Then there is another beardless iris called Longipetala Superba, or Mrs. A. W. Tait, which is a soft porcelain blue.

Among the beardless iris we have the native European iris, Pseudo-Acorus, which is yellow, and our own American variety, which grows in almost any of the swamps. The Pseudo-Acorus has long, narrow leaves which grow high, and it is worth while growing for the foliage alone, if it does not ever bloom. It has quite nice yellow flowers. Let me say in regard to the iris, that they can be planted most any time of the year. The best times are in August or the spring, however, although I have planted Iris almost any time; even when they were full of buds. You can take an iris, and throw it out on a dump, and go back in a couple of weeks and plant it, and it will grow again. It is not over particular. It will do almost its best under adverse circumstances, although it will do better if it is given the proper care, of course.

THE PEONY

Peonies do not require very much in the way of culture. The best time to plant peonies, of course, is in September. Some nurserymen take their peonies and hold them over until spring for the last year's bloom, but they do not do as well as they do when planted from the first of September until they freeze up. The sooner you can get them in after the first of September, the better it will be, because they will have an opportunity to make a good root growth before winter. The tops of the peonies should not be cut off until they are frozen, I would say, and a good many peony growers do not cut them off then, because the stems are hollow, and water will get down into the crown, and rot. So I just bend mine over and leave them there to catch the snow, and in the spring I cut them off. The peony has very few enemies. Once in a while you do have a little root rot. Sometimes that is traced to manure. They do not like to come in contact with manure. I would advise bone meal as a fertilizer, and a little nitrate of soda, perhaps, in the spring, to encourage leaf growth, although you do not want to give them an over-dose of that, because you do not want all tops. Nitrate of soda is pretty strong, and liable to burn them. In order to secure fine exhibition blooms most peonies should be disbudded. Most peonies send up a large bud in the center, surrounded by other buds, and they will all bloom if you give them a chance. The surrounding blooms will not be as large as the center one, so if you want the finest blooms, take off all the little buds around the center one, the same as florists do with chrysanthemums.

Now, as to varieties. Festiva Maxima is one of the old standbys. It was originated in 1850, I believe, and in some respects it has not been beaten yet. It is a strong grower. It has a large flower, and is very fragrant. It is a pure white, with a few crimson marks in some of the center petals. I think if I had only one peony, I would want Festiva Maxima. Madam de Verneville is another good white, a strong grower, and very fragrant. Mons. Dupont is another fine white, large, flat flower, with a few center petals tipped carmine. Albatre, which is practically the same as Avalanche—some growers say they are identical—is a very fine white, with a few petals in the center having a little edge of carmine or ruby. It is a fine peony. These last two are mid-season varieties. The first ones that I mentioned are earlier.

Now, in the late white, we have Baroness Schroeder, which is a flesh white, changing to white, and a very fine flower.

Coronne D'Orr, is another old standard white which is very good. It has a collar of yellow stamens around a tuft of central petals, and these central petals are tipped carmine. This is an ivory white.

Then in the pale pinks we have some very lovely flowers. Among the early ones are Eugenie Verdier. This is a hydrangea pink, very delicate and very fine.

Now, all the peonies I am going to give you now are moderate priced peonies. I do not think any one will cost over $1.50 or possibly $2, and some very much less. I will give you a list later on of the higher priced ones. But you do not have to pay a big price to get a good peony, and the price does not always indicate whether a peony is good or not. When you realize that it takes about seven years for a grower to know whether he has got a good peony or not from seed, and it takes about ten years more for him to work up a respectable stock of it, you can understand that he has got to charge a high price for his roots when he puts them on the market. And when they are new, they are high priced because they are scarce. The law of supply and demand governs. But they may not be much better than some of the older varieties, of which there is a large stock, like Festiva Maxima, for instance. You can get that for fifty or sixty cents anywhere, for it has been on the market so long that there is a big stock.

Octavie Demay is a hydrangea pink striped with carmine. It is a very fine flower. Then in the mid-season we have Eugene Verdier, which should not be confused with Eugenie Verdier. This is one of the pinks that they measure the others by. It is a standard variety, a standard pink, and a very fine all around flower. One grower considers it—at least, so he says—the best peony there is, although I do not agree with him on that. But that shows you that it is a very high peony.

Among the late varieties we have Albert Crousse, which is of distinctive form, like a big flesh pink carnation. Among the deep pinks and the early varieties we have Mons Jules Elie. This is also a pink to measure the others by, one of the very best pinks that we have. It is a very large peony, and has a silvery reflex, and is very sturdy, and also fragrant.

Madam Ducel is another distinctively shaped pink. It has a collar of wide petals, and the center of it is a large ball that looks like a big chrysanthemum. The petals are narrow, and they are curved in like a big chrysanthemum. That is a very good pink, of distinctive shape.

For mid-season we have Madam Geissler, a violet rose, tipped silver, one of the largest of the peonies. Clair Dubois is a light satin pink, which is also very fine.

Among the late pinks we have Livingstone, which has a beautiful soft pink center, and the petals are flecked carmine.

In the red, the earliest peony that we have is Officianalis Rubra. That is the old red peony of our grandmothers' garden, but because it is a good red, a very good red, and very early, there is still a place for it. Augustin d'or is a bright brownish red. Those last two are early. For mid-season we have a very good red in Felix Crousse. This is a brilliant red flower, and one of the best. Souvenir d'Exposition Universal, is a violet rose, tipped purple, and a very good variety, very fragrant.

In the lates we have Delachei, which is a violet crimson, slightly tipped silver, growing on a long soft stem; it is a very good growing variety, although it is not as large as some of the others.

Then there is another group of peonies which are called Japanese peonies. They are really in the process of forming from a single to a double peony. You know, the peonies originally were single, but through cultivation they began to double, by the

stamens widening out and forming petals. The Japanese peony is just about midway between the single and the double. One of the best of these is the Mikado. It has a dark crimson center, edged and tipped gold, and is a very striking flower. There are also a number of other very good ones, which are new.

Now, these are all moderate priced peonies, and I think they are some of the best of the moderate priced ones. I have here a short list of some of the newer peonies, which I think are a little higher priced, but still not up too high; around $25. You know they sell peonies for $100, and some of the enthusiasts would give more than that for a good yellow peony.

Primevere is a large sulphur white flower, with a yellow center. It is one of the rare peonies, and is a good peony. Elizabeth Barrett Browning, which was originated by Mr. Brand, of Faribault, Minnesota, is an enormous pure white, and the American Peony Society voted that the best peony of American origin. And by the way, Mr. Brand advertised in his latest catalogue that he has a ruffled peony. He does not advertise it for sale, but he merely makes the announcement that he has a ruffled peony. You know what the ruffled gladiolus is like—a big improvement on the plain petaled one; and he claims that this ruffled peony is just as great an improvement over the ordinary peony.

Jubilee, by Mrs. Pleas, an American grower, is one of the very finest peonies, and won prizes at the last American peony show held this summer. Lady Alexandria Duff is a delicate flesh pink, which has been a high priced peony, but the price is coming down within reach. It is a very fine peony.

Le Cygne, another French variety, is a pure ivory white, and one of the best peonies.

Martha Bulloch is another of the Brand peonies, and one of the best pinks in cultivation; an enormous flower, some ten or twelve inches across. It is among the high priced ones, of course. Mary Brand is another Brand origination, which is one of the best reds. Solange is an orange salmon, which is very hard to describe. It is a very fine color, and a very fine flower. Therese is also a very fine pink peony, one of the best. It is a fine flesh pink, and one of those peonies that you want to possess as soon as you see it.

Now, there are others that I could name in that list. Mrs. Harding is a new peony. I believe that is on the yellow order.

It sells for $100. There are other new peonies that are high priced, but it is perhaps just as well to see if they are going to stand up before paying such a high price for them.

Now, I think that is all I have to say. I want to invite you again to join these two societies—or three, in fact: The Northwestern Peony and Iris Society, the American Iris Society, and the American Peony Society. I am sure you will get a great deal of inspiration and help out of your membership, if you should decide to join. I thank you very much for having had the honor and pleasure of speaking to you this morning.

DISCUSSION

MR. SMITH: If we are going to plant irises, we have got to move pretty fast, have we not, to get them in in August?

MR. KENNING: Well, they do not have to be planted in August, you can plant them in September, and mulch them a little bit. If they are planted around the first part of September, they will get plenty of root growth all fall. In fact, I moved a lot of them last year just before frost, and mulched them with gladiolus tops, and I did not lose one of them. They came through in fine, sturdy shape.

MR. WILSON: Is there any special preparation of soil necessary for irises?

MR. KENNING: Not particularly; but if you suspect your soil of being sour, you had better give it a dressing of either air slacked lime or ground limestone. That is, for the bearded iris.

MR. STRONG: How often do you separate the roots of the iris?

MR. KENNING: After an iris gets to be four or five years old it gets a hard center. You can take it up and take out the hard center, and set out your plant, and it will be all the better for it the next spring.

MR. CHRISTENSON: Is not the first of September rather early for transplanting? They would hardly be ripened up. We usually plant about the first of October, and I wondered if there was any advantage in planting earlier than that.

MR. KENNING: The first of September is about the earliest date. The plant may not be ripened as much as it would be a month later, but then, on the other hand, it has that much longer to make root growth. Mr. Cooper here is quite an authority on irises, and he might give us his experience on that.

MR. COOPER: I am not so much of an authority. I live in Kenosha, only ten miles from Racine. I have 20,000 peonies

down there, nearly all of the newer varieties. If anybody wants to see what peonies are, rather than just hearing them described, I will be glad to show them. This spring when my peonies were in bloom I had as high as 900 automobiles in one day come there to see the flowers. I had about 200,000 blooms, I should estimate. We gave them away to anybody who came. We cut in one day about 10,000 peonies and gave them away to those who came to see them. They say that you have to go away from home to find out what there is around home, so it is possible that the people in Racine do not know that there are any peonies so close by. I think perhaps that is the largest planting of peonies in the state of Wisconsin. While I have 20,000 now, I am going to plant out this coming September 20,000 more. I am going to confine myself to not to exceed 100 varieties of the best.

Now, the preceding speaker did not say very much about the American Peony Society. It seems to me that a good deal ought to be said about it because about 12 or 15 years ago they took up the matter of systematizing the peony business, and they found out there were about 2,000 different varieties of peonies. When you come to look into 2,000 flowers like the peony, you will find that there are a good many of them almost alike, or so nearly alike that neither you nor I nor anybody else could tell the difference. The fact is that the nurseries, if they lose the label off of some of their peonies, do not know what to do, because they do not know the variety, there are so many so nearly alike. So the peony society has gone to work and is trying to eliminate a lot of them.

Now, a good many of them were going under several names. One, as I recall, had 24 different names. If a nursery man would lose a label, he would give the peony a name and send it out under a different name; so that one variety had accumulated 24 names. They have eliminated all that. And more than that, the society is voting on which are the best varieties, and trying to eliminate the varieties that are valueless, not worth raising. They are all the time cutting them down nearer to the best varieties. As the speaker said, some of the older varieties are just as good as some of the new, and they are very cheap. If there were not any rose enthusiasts here I would say that the peony is the best flower there is, by all odds. It smells just as sweet as the rose, and looks a good deal better, and is so much easier to grow. Raising peonies is just like raising potatoes. You put them in the ground and they take care of themselves. You do not even have to dig peonies in the fall, and you do not have to plant them in the spring. They are there all the time.

WHO ARE THE FRIENDS OF OUR NATIVE LANDSCAPE

JOHN G. D. MACK, *State Chief Engineer*

It is a double pleasure for me to attend a meeting of the State Horticultural Society, first on account of having been assigned a subject in which I am so greatly interested, and second, because one of my early recollections is about such an association. My father was a lawyer but had been a farmer until twenty-six years of age, and he never lost interest in agriculture and horticulture, never missing a meeting of the County Horticultural Society, so that I heard the subject discussed at home from the time when I had but the most vague notion what it was all about except that it had something to do with apples.

I am going to discuss an idealistic subject, "The Friends of Our Native Landscape," an organization of universal appeal.

The word "Idealistic" is used with deliberation, for we are so filled with the idea that in education everything but the so-called "practical subject," a greatly overworked term by the way, must be eliminated, rigidly excluding the theoretical and idealistic.

A disciple of the practical school is destined to meet many a rude shock as he finds case after case in which the despised "theoretical trash" turns out to be more practical than anything taught in the empirical school.

Scarcely an illustration comes to mind in which any one of the great basic inventions which make the comforts of present life what they are, but at some time past was the serious plaything of a man whom his neighbors were sure was not quite right and who was frittering away his time.

The future, even for a year, appears an interminable period, but a year in the past seems but a moment.

The future being so long distant we do not realize that it will soon be here and thus do not lay the proper plans.

We do not plan to broaden our streets, when it might be planned with small expense, except in rare cases, until we suddenly find the expense is prohibitive on account of development.

We have not protected nature's beauties. If we do not protect them, critics of the future will regard us, who destroy the charming vista, the choice bit of woodland, the marvelous rock founda-

tions, such as there are at Devil's Lake and vicinity as we regard the vandals who wrecked the architectural monuments of antiquity.

Fortunately an awakening is at hand and it is getting more and more the force of law behind it.

Creative laws trail public sentiment, seldom if ever does the law go in advance.

One of the greatest stimulants has been "The Friends of Our Native Landscape," organized in Chicago some ten years ago, under the militant spirit of that true friend of nature Mr. Jens. Jensen.

Wisconsin has its new County Rural Planning Law, an immeasurable step in our state in advance in the preservation of nature's best works.

The Woman's Clubs have some great things to their credit in the preservation of landmarks as has the Wisconsin Archaeological Society.

I am a member of the landmarks committee of the State Historical Society. Under the leadership of the Hon. P. V. Lawson, this committee took for its first work the arousing of public sentiment in the preservation of Aztalan.

Many cities have done wonderful work in planning and securing parks, drives and playgrounds.

The Friends of Our Native Landscape, however, is the all including organization where all the specialists may get together and by mass action arouse public sentiment before it is too late and the damage done beyond repair.

I have tried to think of a group who would not be interested in the work of the Friends, but with no success.

One large group, the children, will all be with us, for most of them would rather live outdoors than indoors. The native landscape appeals to them for their imagination is still unimpaired, and they regard the finest of man made parks with some disdain. in comparison with the woodland, lakes and streams as left by nature.

Then we might consider the persons who like to hunt, camp, fish, drive or walk, in addition to many other outdoor diversions, all will be with us. Also the farmer, who has quite as much if not more appreciation of these things than has the city dweller.

Why do so many persons choose for their vacation place the wildest spots they can reach? It is to get away for a time from the artificial places, back to places like the haunts of their distant ancestors, some authorities hold. These ancestral traits are in all of us in some form.

For those who can not go to the distant places the Friends propose to bring the distant places nearer home, that all may have opportunity to enjoy them, and thus add to the happiness of those here and those to come.

Is it idealistic? Possibly, but at the same time, it is so intensely practical that it should delight the narrowest exponent of the purely utilitarian.

My topic is, "Who are the Friends of Our Native Landscape?" It will be easier to reverse the question and tell who are the enemies, for when the purposes of the Friends are understood, there are no enemies.

IS SPARTA COMING BACK?

F. KERN

Just why our Secretary should have imposed upon your good nature and your presence here by placing me on the program, when I am not a public speaker, I cannot quite understand, but I received this notice not long ago: "You are drafted. Your topic is: 'Is Sparta Coming Back?' and, like every good soldier who is drafted, I am here. The topic assigned me, "Is Sparta Coming Back," is peculiarly worded and is mighty hard to talk on by one who has lived all his life in and around Sparta. Had my topic read "Is Sparta Going Back?" I could have made a very short address and told you the whole story by saying, "NO," but the Secretary, when he assigned this topic, must have had in mind the story told of the president of one of the Gould lines, where a train pulled into a station and young George Gould stepped off the train and accosted the car inspector, Jed, who had been with the company for a long term, and the president said to Jed, "How they using you, Jed?" "Nothin' extra." "This is a pretty good line, isn't it?" "I should say not." "They pay good salaries, don't they?" "Not very." Then Gould said, "You don't know me, do you Jed?" to which Jed replied, "Yes, and I

knew your father and worked for him when he was president of this road before you were born, and I expect to be working for him again before long." Gould, astonished, said, "Why, my father is dead—died twelve years ago." Jed said, "Oh, I know it, but this whole business will go to hell before long."

Now, Sparta isn't going that way. Sparta isn't going back, nor coming back. Sparta is coming forward. Perhaps a bit of history bearing on fruit growing at Sparta might be of interest to you, and I presume it is fruit growing at Sparta and not Sparta that I am to talk about.

Back somewhere in the seventies a Mr. William C. Wells began growing strawberries commercially in the town of Sparta, and one year he had two or three wagonloads. They were picked in tin pails and sold by the pail, or by the quart, and poured out of these tin pails. Mr. Wells is known to us as the pioneer fruit grower of Monroe county. About 1880, or possibly a year or two earlier, E. W. Babcock, who had planted a few berries, got in a few old style 24-quart crates and in 1880 began shipping to Minneapolis, and that year glutted the Minneapolis market. He shipped to C. G. Hillman, in one shipment, 12 of these 24-quart crates of strawberries and received a letter something like this: "Received the berries and sold them at pretty good prices but would advise you to be a little careful about making such heavy shipments to this market in the future."

From 1880 to 1909 there are no records of the fruit business available at this time, but it is a known fact that the strawberry industry grew and grew until about 1903 to 1907 growers began to drop out of the fruit business in this section, turning their attention to the dairy business on account of the very low prices then prevailing for strawberries, as low as 50 cents for good berries.

In 1896 a selling organization was formed, known as the Sparta Fruit Grower's Association, which continued in business until their charter expired, in May, 1919. This organization had no power to regulate the grading and packing of berries and for a number of years in its early history did very little selling, merely look after the loading—each grower having his name on the crates shipped and returns being made direct to each grower.

Buyers from outside used to come to Sparta and at the very opening of the season, along about 1900, they used to buy from

the grower on the street and several buyers from Minneapolis, for instance, would load their purchases all in the same car, but these buyers were finally educated—not in Sparta—but before they came to Sparta each year, and they would size up the situation and, after making good fellows of themselves for the first few days, when there was not enough fruit to go around, they would combine—"organize" and agree (among themselves) not to buy any berries today, and the growers would come in about the usual time with their loads and stand around on the street with their loads like lost turkeys. No buyers in sight, or, if they were in sight, they had orders from the house not to buy anything today, but they would take the berries on consignment—just as a matter of accommodation to the grower—not that they wanted the berries. There was nothing else to do but to consign to his house, as none were buying, and you know the rest of the story—about how the berries arrived "soft," many "unsalable," or it was rainy, bad weather and your berries "struck an unusually bad market," but "we think by the time the next car gets here our market will clean up and we can probably please you on the next shipments."

Now, some of these growers have lived through all of this and are still in the business. I have taken the figures for one farm from the records of the Sparta Fruit Growers' Association since 1909 and, by the way, this farm has been growing berries for more than 30 years without a skip—so these figures will show the trend of the fruit business at Sparta for the twelve years. I will not go into all the fruits grown on this farm in detail, but will give you the record on strawberries in full:

Year	Crates	Average	All Fruit Average
1909	1,821	$1.10	$1.31
1910	722	1.55	1.60
1911	1,221	1.03	1.21
1912	715	1.10	1.25
1913	305	1.29	1.26
1914	623	1.39	1.40
1915	871	1.38	1.34
1916	742	1.38	1.46
1917	1,328	1.34	1.37
1918	201	2.41	2.41
1919	817	1.88	....
1920	1,020	2.47	....
	10,386	$1.45	

During these twelve years covered by the figures just read there were grown on this farm 10,386 crates of strawberries, 1,401 red raspberries, 394 black raspberries, 2,043 blackberries and 996 gooseberries, making a total of 15,220 crates. No bush fruits were grown on the farm since 1917. During the period in which bush fruits were grown, there were three years that the average on bush berries lowered the total average for fruit grown on the farm—1913, 1915, 1916. The figures just given you seem to show that with but one exception during the twelve years covered, every year the number of crates increased the average price was lowered. We do not mean to infer from this that this particular farm influenced the markets, but that it has proven a sort of a barometer in this case.

Sparta has been noted for its production of berries and for a number of years was a factor in the business, but during the last ten years acreage has been cut down, yields were light and in 1918 Sparta was practically out of the strawberry business. This dropping off in production during the past ten years is attributed to various causes. For a time we thought berries had been grown too long and that they were runinng out—so to speak—plants rusted and blighted badly, yields were light per acre—so light it discouraged strawberry growing to quite an extent. It was believed by some growers that the Dunlap was responsible for light yields and short seasons for this variety, and that Warfields run small after the first few pickings. Both seemed to be true a few years back, and most growers set Pocomokes for a late berry and to increase their yield, but it is now believed by some of the growers that the main factor in cutting the yields of Dunlap and Warfields was due to the ground freezing too hard and so deep as to injure the roots and weaken the plants and thus shorten the yield. The fact that the yields have increased remarkably from these same varieties on the same old farms during the last two seasons, seems to have improved the reputation of these two standard varieties. One nine acre tract in 1919 produced nearly 3,600 crates and the same nine acres with six acres of new settings yielded more than 4,500 crates this season. One field of 112 rods yielded 443 crates in 1919 or at the rate of 624 crates per acre and the same 113 rods added to one acre new bed this season made 839 crates that were marketed and netted $2,043.02 or at the rate of $1,201.60 per acre

net to the grower on the farm. The fifteen acre tract netted the Association $9,388.53 or approximately $625 per acre for five acres picked the third season, 4 acres picked the second year and 6 acres picked the first time. These are not selected records but are the ones available on a moment's notice, and are not, in all probability the best yields but they will tend to show that we still grow strawberries at Sparta. We are practically out of the bush fruit business as is every other section in the state and we are unable to fill orders that come to us voluntarily, except possibly at times on blackberries and one farm at Sparta used to produce four times as many blackberries as the whole district now produces. Under the new organization there seems to be a keener interest in the berry business and acreage is gradually increasing. Last season we shipped 28 cars and this season 41 cars. In 1919 we handled 17,281 crates of straws through the Exchange and this season we have handled 22,740 crates or an increase of nearly 32 per cent. Our crop of bush fruits this season will be approximately the same as last. The acreage set to strawberries, spring of 1920 added to that carried over will increase our acreage for 1921 about 10 per cent.

The acreage picked at Sparta in 1919 and marketed through our organization was approximately 70 acres, and that picked in 1920—the present year, handled by our organization was about 90 acres, of which approximately 40 acres were planted in 1919 with about fifty acres planted in 1917 and 1918. In 1919 we handled 257 crates of red raspberries, 302 crates of black raspberries and 1,375 crates of blackberries. This season to date we have handled 375 crates of red raspberries, 245 crates of black raspberries and 825 crates of blackberries. Blackberry total will be less than in 1919 due to a few growers neglecting to put down the cane last fall and the cane winterkilled.

I have given you a condensed report of what we are doing at Sparta in the fruit business and leave it to you to judge whether or not SPARTA IS COMING BACK.

THE CONTROL OF ONION AND CABBAGE DISEASES

JOHN MONTEITH, JUNIOR

(From Reporter's Transcript.)

To a group of horticulturists the mention of plant disease control at once suggests the idea of spraying with Bordeaux mixture or lime sulphur. If any of you have ever tried to spray onions or cabbages, you will understand that in the case of these crops we are up against an entirely different problem. It is simply like pouring water on a duck's back. Of course, we can make it stick by the use of fish oil soap or other combinations, but for different reasons we do not in general use sprays for the control of plant diseases in these two crops. In the onion, the most serious field diseases we have in this state is the smut. This is caused by an oil-infesting organism; that is, the germ which causes the disease gains entrance into the soil, spreads rather slowly but surely, and when once it is in the field, it is there to stay—just as long as onions are grown. The most serious diseases of cabbage are also what is known as "soil diseases." When they get into the fields, we have what is known as "sick soil." Crop rotation as a general thing will check such diseases, but in this section there are a good many fields where onions and cabbages are the most profitable crops, and the farmers quite naturally do not like the idea of a long crop rotation to hold up their fields; so we have to develop other means.

As I said, the smut is the most serious field disease of onions in this state. The organism causing this disease has a very fortunate characteristic, however, of being able to attack a plant only in the very early stages of its development. That is, if an onion is grown to four or five inches in height, say, and then planted into sick soil, it can grow into a perfectly healthy plant. This calls, of course, for a temporary protection of some kind during that early period, and this has been provided in the form of formaldehyde drip treatment. This is applied by an attachment on the seed planter, from which the solution of formalde-

hyde is dripped into the furrow right behind the seeds, just before the packing wheel covers them. In that way the formaldehyde is included with the seeds, and spreading through the soil holds the disease in check. So the seeds germinate and the plan to grow to several inches in height, before the formaldehyde has evaporated from the soil. In a few weeks, of course, it will escape, and the onion smut may develop; but by that time it is too late to injure the crop. The other diseases of the onion are pretty much of a late season or storage nature, and are controlled effectively by proper methods in storing and handling. These include some of the methods that Dr. Fracker suggested with reference to the control of insects; I specifically refer to cleaning up rubbish. That helps in all such diseases. You cannot throw rubbish from a smutted crop of onions on a new field, thinking you are going to get fertilizer from it, without getting some of the smut that goes along, and spreading it throughout the field.

On cabbage, the most serious disease we have here is what is known as the cabbage yellows. This is also a soil disease, and has occurred for many years on a large number of farms in the neighborhood south of here where cabbage has been one of the most important crops. A large number of fields had to be abandoned for cabbage growing ten or more years ago, because they were so sick that they could not produce a profitable crop. Unlike the onion smut, this disease will develop at any time in the season, especially during the warm weather. Therefore, no temporary treatment will control it. In this case we have had one of the most interesting and effective means of control that has been devised in recent years. Ten or more years ago, when the fields I spoke of were failing to produce crops because of this destructive disease, Dr. Jones, head of the department of plant pathology in this state, was called to look at them and advise treatment. As he went through them he noticed that of the plants that remained alive there were a few which showed no signs whatever of the disease, so he assumed that there must be something in those plants which caused them to be able to resist the attack, when all the others around them were dead. To test out whether that "something" could be carried over into the next generation, he selected the best of those plants and had them grown for seed. The next year the plants from that seed were grown in a sick field and they produced a comparatively healthy crop. Then with

the aid of Mr. W. J. Hansche, who knows cabbage growing from A to Z, there have been developed a number of strains of yellows-resistant cabbages. These are now producing large crops on soil that had a few years ago been given up as hopeless for cabbage culture. Tomorrow you will see some of the resistant strains which we have on a sick field; growing side by side with the ordinary commercial strains. You will see the commercial strains badly injured by yellows, and the selected ones practically untouched. A large number of the formerly abandoned fields have been replanted to cabbage now, and they are producing crops just as good as ever.

Another disease of cabbage is the blackleg. This is being attributed very largely to seed infection; that is, the organism is carried over in or on the seed. One seed will have the disease and produce a diseased seedling in the seedbed. It will then be washed over on to other seedlings which will be transplanted out into the field before they show any signs of the disease. Later it will develop and cause the plants to wilt and finally die; sometimes destroying a large per cent of the crop. Since it is carried over on the seed, the best treatment naturally is to get seed that is known to be clean. That is easier said than done. So we treat it with formaldehyde or corrosive sublimate solution, which gives very effective control.

A disease not so common in this state as it is in the East is the clubroot. This is a disease that lives over in the soil, and produces large swellings on the roots which naturally prevent the cabbage from forming a head. It is usually recommended that soil affected with clubroot be given heavy applications of lime—although this treatment is known to be of little benefit in certain special cases.

Another disease is the black rot. This requires a moist, warm summer to develop, so we have had very little of it here this year, and I could not find any specimens to bring with me. It causes a wilting and yellowing of the leaves, and a distinct blackening of the veins, spreading through the cabbage and leading to a complete rot. This is not under control so far. We are beginning to trace it, however, to the seed and later we may have some better methods of control to suggest. It is something that occurs one year, and not in another, being apparently closely dependent on weather conditions for its development and spread.

These are the principal diseases. There are some minor ones, of course, which I will not take time to go into unless some one has specific questions to ask about them. The principal ones we have under practically complete control. The others we hope to have under control before long.

TRUCK CROP INSECTS OF 1920

DR. S. B. FRACKER

I had intended to begin this little talk on truck crop insects with Dr. Marlatt's estimate about ten years ago, that insect pests caused an injury to truck crops of about $68,000,000 per year, including the costs of insecticides applied to the crops. That $68,000,000 now seems so small in comparison with the yields of small fruit, such as we have heard described this afternoon, that I hesitate to mention it.

Truck crop insects attack the plant at so many different places that the subject is very hard to outline. Some of them feed on the leaves, and when the leaves are the valuable part of the crop, the crop may be a total loss, as in the case of cabbage. Or when the leaf is not the part that we eat, as in the case of beets, the crop may be seriously reduced owing to the lack of vigor of the plant. The insects may devour the root, and if the root is the economic part of the crop, as in the case of radishes, the presence of worms or insects in the roots may be a very serious factor. They may tunnel the stems, resulting in the death of the entire top of the plant. They may burrow in the seeds and the fruit, as in the case of tomatoes, and make the fruit practically worthless. Possibly a good deal of nourishment remains, but the fruit is certainly not marketable. Or, on the other hand, they may simply reduce the vitality by sucking the plant juices. In addition to that, they may carry plant diseases, as in the case of the cucumber wilt, the sugar beet curly leaf, and the potato hopperburn.

As an introduction to the discussion of the individual insects, it might be well to outline the three great principles of pest control.

The first is that of clean cultivation, clean fence rows, and the cleaning up of the ground after the crop is harvested. This is

especially important in the case of truck crops, although often neglected. The leaving of the fragments of cabbage plants, the refuse of onions when the onions are harvested, and the damaged ears of sweet corn, in the field, means that centers of trouble are established for the following year. Sometimes it hardly seems practicable to clean up these fragments; but their presence is one of the reasons why it is often necessary to adopt more laborious control measures later.

The second great principle of insect control is the matter of crop rotation, or moving from one location to another. When it is not practicable to clean up all of the fragments of the truck crop harvested, the measure of moving to a new location is a desirable and even an essential one.

The third great principle is the application of insecticides. It is hardly necessary to discuss the ordinary, common insects attacking the garden, and the insecticides to be employed against them. If we divide the common insects into two main groups, the leaf eating insects, primarily the caterpillars and beetles, and the sucking insects, primarily the plant lice, and simply tell our old, old story of applying an arsenical, preferably lead arsenate, in the case of anything that eats the leaves, and nicotine sulfate in the case of any plant louse or other insect which sucks the plants themselves,—if we simply cover the subject in this simple fashion, that is sufficient. There is no need for me to go into detail and outline the life histories of the various cabbage, beet, and onion-attacking worms and plant lice, for that would simply be a waste of time.

If we will then ignore all of the ordinary worms and the plant lice, because their control is usually simple, and I am sure that every one in the audience understands that already, we may take a little time to outline some of the insects which cannot be controlled by the ordinary insecticides. The first one that will occur to your minds, as to mine, I am sure, will be the cutworm. The two common and successful methods of controlling cutworms consist of either protecting the plants or killing the worms; you have your choice. Many gardeners take some stiff cardboard, and set it up around tomato and cabbage plants, with the base of the cardboard or paper collar covered with earth, and that is an effective remedy. I have never seen a plant protected that way which was damaged. Where tomato and cabbage are grown on a

commercial scale, and cutworms are bad, or where you are trying to protect corn against cutworms, and such a measure is not possible, a very practicable remedy consists of scattering poison bran mash in the evening, in the early spring, over the gardens or fields likely to be infested. This poison bran mash is made in a number of different ways, and several different formulas have been published and recommended for it. One which is easy to remember and is as effective as the others, is to take a bushel of bran, a pound of Paris green and a pint of molasses; mix the bran and the Paris green dry, and add enough of the molasses, diluted with about three times its volume of water, to make it fairly moist.

Another insect which has been bothering everyone who tries to grow potatoes is the leaf hopper. The most successful remedy found last year for the potato leaf hopper was the spraying of the under side of the leaves with Bordeaux mixture. The Black Leaf 40 recommended the first year that the leaf hopper was discovered, is more or less effective, but it required too many applications, and the use of Bordeaux mixture as a repellant is more effective and more profitable. The Bordeaux is mixed with the arsenical for the Colorado potato beetle, and two or three applications are sufficient. As you know, everywhere in the state the Early Ohio has gone down completely on account of the work of the leaf hopper unless the plants were sprayed. Every variety on which the Bordeaux mixture was tried this year has stood up in excellent shape up to the present time, with the possible exception of the Triumphs which are especially susceptible. The Bordeaux mixture does not kill the leaf hoppers; it simply drives them away. Why it drives them away we do not know, but the measure has been very successful. The Rural New Yorkers may not need spraying. The Green Mountains probably will.

One other insect with which every home gardener comes in contact every year is the striped cucumber beetle. I object very much to hearing anyone call this striped cucumber beetle a squash bug. Every once in a while a letter comes asking for information about how to control the squash bug, and unless the writer goes into more detail than that, he is sure to get the wrong information, because the squash bug is not the striped cucumber beetle, and is not nearly so common as the cucumber beetle. The squash bug is a bug with a sucking mouth part, about three quarters of an inch long, and is a large, grayish black insect which does not

resemble the little yellow and black cucumber beetle in any respect, either in its life history, its feeding, its method of control, or the amount of damage it does. The striped cucumber beetle is a true beetle, belonging to the same family as the Colorado potato beetle, or the common potato beetle.

This beetle may be repelled to some extent by the application of wood ashes. It may be poisoned, to some extent, by the application of lead arsenate. The best spray that has ever been recommended from a commercial standpoint, consists of a combination of Bordeaux mixture and lead arsenate, to act as a repellant and poison. The reason I would hesitate to recommend that is the very excellent one that on a great many fields on which it has been tried the spray has not been as successful as it should have been.

There is a long list of truck crop insects which require special treatment, such as those already outlined,—the potato leaf hopper, the cucumber beetle, and the cutworm. I doubt whether it is desirable to go into any more of them in detail. Possibly, however, you may be interested in the onion insects, especially here at Racine. Outbreaks of onion thrips are becoming more numerous. This is an insect which the grower usually does not see at all. He blames the work on some disease. The effect of the onion thrips is known as white blast. The thrips is a minute insect not more than one-eighth of an inch long, very slender, and yellow, so that it is nearly transparent. It almost takes a lens to see it. But they occur in large numbers. They have a peculiar form of jaw that is different from any other insect. They eat away just below the surface of the epidermis of the leaf, just below the outer layer of cells, so that the outer layer of cells turns white, and the sap and the growing tissue is damaged very badly. Sometimes, where they occur in large numbers, the result is the curling of the onion tops, a malformation and twisting, giving them a scaly white appearance, often resulting in wilt. As a result, there is usually a very poor crop. Fortunately, the thrips can easily be controlled in exactly the same way as plant lice, by the spraying of Black Leaf 40 in soapy water, in this case about 1 to 800.

The easiest way to cover the subject which you wish discussed is to open the meeting now for any questions. There are a large number of other insects set down in my notes here, but I hardly

think it is desirable to go over all of them. The more insects discussed, the less will be remembered about each one. But if there are some particular insect problems worrying you, with the successful control of which I happen to have come in contact, I will be very glad to discuss them.

DISCUSSION

MR. SMITH: What is the remedy for garden slugs?

DR. FRACKER: In the home garden we recommend poisoning lettuce leaves with Paris green, and strewing them around the garden in the evening. Of course, that is not practicable on a large scale. They will eat some poisoned bran mash, and that is about the only thing that is really practicable on a large scale, as has been suggested. In the ordinary garden, though, I think I would simply scatter Paris green over some lettuce leaves, chop them up and scatter them around the garden. The poisoned bran mash outlined for cutworms will control them, if you need to use something that is somewhat more practical than poisoned lettuce leaves.

MR. HAUSER: Is there any danger of poisoning birds with this hopper bait? We hesitated on that account this summer. We had a place that was just about eaten up by the grasshoppers, but right adjoining that we had a field where there were crows feeding all the time, and I was wondering about that.

DR. FRACKER: Poisoned bran mash will not poison poultry if a bushel of the bran mash is distributed over three to five acres, which is a suggestion given. Whether crows and such birds are more susceptible or not, I do not know. It may be that it might be more attractive to them, and they would eat more of it; but it will not injure poultry at the rate given, nor cattle, either.

MR. HAUSER: How about the small song birds? Will it kill small birds?

DR. FRACKER: I have never had any complaint about that. A great many bushels of this bran mash have been distributed this season, and we have not received one single complaint about the result. The grasshoppers have been very bad all the way across the state, from Washington Island in Door County clear across to Superior. We have had one of the members of the staff out part of the time helping farmers to mix up the bran mash, and arranging with county agents for meetings; and we have not received any complaint of poisoned cattle or song birds or poultry, or anything of that kind.

MR. HAUSER: I think, if that information was generally known, or more generally known, among the people, more of

them would use that bait, because a lot of them do not, for just the reasons I have suggested.

MR. SMITH: I would like to speak of the experience that we had years ago with the striped cucumber beetle. For ten years at least, I think, when we raised melons and cucumbers by the acre, we followed the system of putting on the field in the spring about 100 little chickens to the acre, distributed up into small lots, 12 to 15 on the average, that the ordinary hen could take care of. We put those in small coops, such as people usually use to keep a hen and little chickens in, and we would scatter them around over the fields of melons and cucumbers, and when we did that we never had the slightest trouble with cucumber beetles. You could sit by the hour and watch those chickens catching cucumber beetles. I have seen them run across the field after a beetle that was flying along in the air, running and stretching their necks, waiting until the beetle got down low enough to grab. We never had any damage from the beetles at all, and that experience continued right along. When I was a small boy, we used to try all sorts of things to guard against them, but after we got onto the chicken proposition we never had any trouble. Then when we did not raise chickens ourselves, we would contract with somebody who did raise them, for one or two hundred, to be hatched at a certain time, with hens to take care of them, and we would keep them on the field until they were no longer needed, and then we would sell the chickens for what we could get for them, and usually it amounted to about as much as they cost. The care of the chickens was the only expense, and the cucumber beetles were absolutely controlled in every case.

A MEMBER: In applying Bordeaux for the leaf hopper, is it necessary to get it on the lower side of the leaf?

DR. FRACKER: It is absolutely necessary to get it on the lower side of the leaf, yes. It is a repellant, and the nymphs and adults hang on the under side of the leaf entirely. An application of spray to the upper side of the leaf will not control the potato leaf hopper at all. I have seen quite a number of cases where that has been tried and the results were no better than if no spray had been applied at all.

MR. SMITH: Is the damage done by the leaf hopper an infectious one? That is, do they infect the plant with some damaging disease, or is the injury they do a mechanical injury, simply by sucking the juices, etcetera.

DR. FRACKER: The entomologists have been trying to get the plant pathologists to make at least a guess as the answer to that question, and the plant pathologists will not even make a guess. Whether it is infectious or not we do not know. We do know this, however, that you can protect a Triumph potato plant until

it gets fairly well grown, keeping it under a cage; and then by providing it with 20 leaf hoppers, and putting the cage on again, practically kill the plant. To me it appears that it is impossible to explain that on the basis of a mechanical injury. I think that there is some form of disease introduced also. But as to whether that is a physiological condition, such as a poison, that we can compare with strychnin in the case of human beings, whether it is a transmissible disease, a germ, or what is called a filterable virus, no one has been able even to hazard a theory as yet.

MR. KERN: When you drive the leaf hopper from the potato patch, does it attack any other crop adjoining, and do it any injury?

DR. FRACKER: The leaf hopper will attack beans, and they are not controlled by the Bordeaux spray on beans. They breed on various plants during the winter and early spring, before they migrate to the potatoes, and then they migrate very extensively. Often they will appear in large numbers on the potatoes over a whole county in one day.

MR. KERN: What can be done for the aphis that infests the under side of the turnip?

DR. FRACKER: Often the turnip is such a hardy grower that you do not need to bother about the aphids, even if they are present in large numbers. But if control is needed, take Black Leaf 40 and soap, and spray it up from underneath so as to hit the insects.

A MEMBER: What would you do in a home garden where grub worms attack your strawberry plants?

DR. FRACKER: White grubs seem to like the strawberry bed better than anything else they can find. If you have heavily infested sod surrounding or near your bed, they apparently migrate over to the strawberries, and I doubt whether there is anything you can do. Ordinarily if you put a cultivated crop such as strawberries on land which has been cultivated in previous years, you will have no trouble; but if there is heavily infested sod nearby some injury may be expected.

MR. WILSON: You recommended that raspberries be changed in location every five years on account of insects and diseases. Now, do you believe or maintain that the diseases are four or five years in finding the location of the raspberries, or do you believe that the raspberries have outlived some of the influences of their location, and would be impoverished anyway?

DR. FRACKER: When you have established a permanent bed, all of the diseases and insects which affect that particular plant are given an excellent breeding ground. Unless some remedial measure is used, such as the application of insecticides, the vari-

ous pests increase in number; and in addition, various infections which were not there before come in from the outside. Mr. Rasmussen is suggesting that since it is so difficult to control a good many of them, we move to a new location, leaving them behind.

It happens, with the raspberry, that until about two years ago there were no successful means of controlling certain serious diseases. It may be that the experimental work now going on will soon show us how raspberries may be kept year after year in the same place like an apple tree.