Annual report of the Wisconsin State Horticultural Society for the year ending July 1, 1922. Vol. LII 1922

Wisconsin State Horticultural Society
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ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year Ending July 1, 1922

VOL. LII

Frederic Cranefield, Editor
Madison, Wis.

MADISON, WIS.
The Homestead Co.
1922

LETTER OF TRANSMITTAL

Madison, Wis., July 1, 1922.

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

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

Respectfully,
FREDERIC CRANEFIELD,
Secretary.

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OFFICERS AND COMMITTEES FOR 1922

OFFICERS

H. C. Christensen, President.....Oshkosh
W. A. Toole, Vice-President.....Baraboo
Frederic Cranefield, Secretary-Treasurer.....Madison

EXECUTIVE COMMITTEE

Ex-Officio,

President, Vice-President and Secretary.

For Term Ending December 1924

A. K. Bassett.....Baraboo
C. I. Brigham.....Blue Mounds
Wm. Longland.....Lake Geneva

For Term Ending December 1923

Paul E. Grant.....Menomonie
J. F. Hauser.....Bayfield
Richard Marken.....Gays Mills
W. E. Spreiter.....Onalaska

For Term Ending December 1922

F. M. Edwards.....Fort Atkinson
James Livingstone.....Milwaukee
Wm. Nelson.....Oshkosh
Arno Wittich.....Sturgeon Bay

BOARD OF MANAGERS

H. C. Christensen Frederic Cranefield

W. A. Toole

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 varietes.

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, Tolman (Sweet), Wealthy, Windsor.

CRABS

Hyslop, Sweet Russett, Virginia, Whitney.

PLUMS

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

NATIVE PLUMS

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

HANSEN HYBRIDS

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), **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, Latham.**
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 Cutleaf 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
Cutleaf 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 Bonstettin.

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:

Dwarf, 2 to 4 feet

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

Medium, 4 to 8 feet

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

Tall, 8 to 12 feet, some kinds 15 feet

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

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 to 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 to 8 feet

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

Tall, 8 to 12 feet, 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 Thunbergii

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
Grandiflora
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. Tulips, 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 Horticulturalist. 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, 1922.

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.

Section 1. The Secretary shall decide upon all applications for membership in accordance with 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 purpose in promoting horticulture may upon return of his membership fee be summarily expelled.

Article II.—Meetings.

Section 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.

Section 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.

Section 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 culti-

vation 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.

Section 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.

Section 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 three 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 Committee may be called at any time by the President of the Society or by the Superintendent of Trial Orchards.

Article VII.—Miscellaneous.

Section 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 seventeen different points in the state as follows:

Poplar, Whitehall, Manitowoc, Baraboo, Holcombe, Pewaukee, Gays Mills, Lake Geneva, Weston, Waupaca, Plover, Wisconsin Rapids, Onalaska, Milton Junction, Fort Atkinson, Mauston and Menomonie.

A "Trial" Orchard is located at each of the nine 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 45 acres and 3,451 trees.

The orchards at Poplar 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 ten or twelve years. The orchards should then yield profitable crops for twenty years longer with but moderate expense for maintenance.

In the spring of 1921 four small fruit stations of one acre each were established. 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. Four additional stations were established in 1922.

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, MADISON, WISCONSIN,
DECEMBER 14, 15 AND 16, 1921

Morning Session, Wednesday, December 14

The meeting was called to order in the Assembly Chamber, State Capitol, by Vice President Christensen.

ADDRESS OF WELCOME

BY HON. J. J. BLAINE, *Governor*

Ladies and Gentlemen: Yesterday I formally welcomed the Rod and Gun Club of this state with the suggestion that I presumed there was no necessity for an invitation or formal welcome to citizens of Wisconsin to come here and use their own property, but as a matter of courtesy, of co-operation with all those who have the best interests of the State at heart, I take pleasure in formally extending to you and all of you a most hearty greeting. Of course, this capitol is yours and for your use, and it is wholly unnecessary for me to say that I hope that you will enjoy the conveniences, and particularly the inspiration that you will get from your own deliberations. I know that that inspiration will come to you, and that you will be assisted in your work by gathering here and consulting with one another about those matters in which you are particularly interested.

Every movement in the state that is looking towards better things, whether it is better marketing, better distribution, more economical means of production, a fairer share for your toil, all those organizations should be encouraged and promoted. Any organization looking toward the betterment of the industrial and social welfare of the state should receive commendation, and I am one of those who have no patience with any one, nor any one's

attitude who undertakes to criticise or hinder groups of individuals in promoting their own individual betterment, because when they are promoting the betterment of that group, if that promotion is in the larger spirit, not in the spirit of exploitation, but in the promotion of the larger spirit, they are going to add just so much more to the welfare and happiness of the entire group of all the people of the State of Wisconsin, and so, Ladies and Gentlemen, in that spirit I appear before you and in that spirit I greet you, and I know that you, so far as it is in your power, will undertake along your own lines the promotion of all those things which affect your particular calling, your particular vocation, that it will promote the general welfare and for the common good, and in that spirit I most heartily greet you.

DAHLIAS

J. T. FITCHETT

(Read at Annual Convention, December, 1921.)

Since the days of Cain and Abel the human race has been divided into two groups—horticulturists and others. So flowers may be divided into two classes—dahlias and others. Our secretary has assigned me the topic of "Just Dahlias, Nothing More."

Five years ago, from this platform I made the assertion that while neither a prophet nor the son of a prophet, I believed the next decade would witness a wonderful increase in the popularity and use of the dahlia as a cut flower. The wildest dreams have been more than realized. Last year the exhibit of the American Dahlia Society was the largest show of a single flower ever staged in the world. This year's show exceeded it by more than half. President Vincent staged a thousand blooms of one variety, Patrick O'Mara.

Aside from being a thing of beauty and a joy forever, the dahlia promises to become a valuable source of sugar. Inulin, somewhat resembling starch, comprises about 14 per cent of the fresh tubers. This may be converted into levulose syrup, from 30 to 50 per cent sweeter than cane syrup. Levulose does not as yet crystalize readily, but it could be used in place of cane syrup in soft drinks, etc., thereby releasing the cane syrup for sugar making.

In no plant can you get such a wide range of shape and color or such a long period of bloom. Last season we cut flowers from the same plants of Geo. Walters in five successive months. My fair colleague will tell you of the beauties and decorative possibilities of dahlias. It is my mission to help you, if possible, in their cultivation and care.

About the middle of May split the old clumps into as many divisions as possible with one or two sprouts on each. It is as reasonable to plant a whole ear of corn as a whole clump of dahlias. A small root is better than a large one, because a plant from a small root will start its new roots quicker.

Best place to plant is in the vegetable garden where they can be cultivated. Dig a hole six inches deep, put back a little loose dirt, lay the root on its side with the sprout up and cover with four inches of loose dirt. This leaves a slight depression around the stem which is an advantage in watering. Two feet apart in the row and three and a half feet between rows is about right. Rake the ground as soon as the planting is completed and repeat this raking every week until the plants are large enough to shade the ground. If the season is dry, water thoroughly at night once a week and rake the ground the next morning. We installed an overhead spray system last year and by means of weekly spraying at night followed by raking the next morning we were able to bring the plants through an unusually dry summer without burning or stunting. This same spray warded off frost until November 2. Flowers are produced on the soft growth, and if through neglect your plants have become hard and woody, better cut them back severely and start over again. A top dressing of fertilizer will help when plants are coming into bloom.

In cutting dahlia blooms, trim off the foliage and dip base of stem in hot water for a quarter of a minute. Then let stand in cold water. Treated thus the stem has only to furnish moisture to the flower instead of to a mass of foliage, and the hot water prevents bleeding.

A week or two after frost has killed the tops cut them off near the ground and dig the roots. Leave what dirt will stick to them and do not separate the clump of roots but store in boxes on the cellar floor where potatoes will keep.

Grow seedlings? Yes, if you have time and room and patience. It is the way most new varieties are produced. King of the Autumn only came to the master grower Hornsveld after years of patient care in Holland. West in England produced Turner, a wonderful pink peony. The Franch gave us LeColosse, the best of the giant show type. Geo. Walters, perhaps the best hybrid cactus yet produced, is the work of a California grower. Do not expect the equal of all these in every package of seed you plant. For you may be disappointed. You will get more definite and satisfactory results by growing standard varieties from roots.

Keep plants growing lustily and you will have but little trouble with insects. The neglected plant is the easy victim for all the ills on the calendar. The tarnish plant bug may injure the new

growth. Dust with tobacco or slug shot. Green lice may colonize on the stems but will not stay if you use the kerosene emulsion or black-leaf-40. Leaf hopper on the under side of leaves is the latest pest. Spray with black-leaf-40 or Bordeaux, bending plants to reach under side if you haven't a spray pump with a curved nozzle. The stem borer works inside the stalk. Its presence is shown by the top wilting. Split stem and remove worm with a wire hook. Tie stem shut with a bit of grass and it will grow together again in a short time.

Another pest is the grower with a limited conscience and an enlarged imagination who persists in inflicting his seedlings on the public in unlimited quantity. They are described in glowing terms and sold at a stiff price. The innocent buyer finds too late that they are often inferior to standard varieties which he is already growing.

The worst pest is the "insect"—to quote Mrs. Jiggs—who neglects his dahlias or fails to properly divide them in the spring and later complains that they have "run out" and are all tops and no flowers.

In closing I wish to quote the late John Lewis Childs: "Dahlias vs. Peonies. Peonies bloom two weeks. Dahlias two to four months. A dahlia will produce about ten flowers to a peony's one, and in most cases they are fully as good and showy, but peonies bloom early when we have no dahlias, hence they do not compete. But remember, you get more for your money in dahlias than you do in peonies. Dahlias bloom well in from two to three months, peonies in from twelve to twenty-four months. The dahlia is the most fascinating of garden flowers, and no other flower creates such intense interest in a show."

DISCUSSION

MR. ROSE: I should like to ask if there is any special planting time. Whether they should be planted real early in the spring, or later, in corn time, or even later, to get the best results for the season.

MR. FITCHETT: Plant early if you can take care of them through the hot weather, keeping the plant from getting hard and woody. Plant late and you are almost sure of a small plant through the hot weather that will not get hard. If you plant early and the plants are neglected, you will get a big plant by the time hot weather comes on, possibly a few blossoms, then the stems will harden and they will stand still through the summer.

As soon as the wet weather comes they will start small branches at every leaf, the stem cannot very well throw out large blooms. We plant early and then we mow the plants down two joints from the top, putting the tops around as a mulch. In that way they make very slow growth during hot weather, but when the coal weather came on, having a good root system, they grew rapidly and blossomed well. You cannot get good flowers from a plant that has been checked in its growth, that is, that is not growing freely.

THE CHAIRMAN: How late would you say to plant them out? What would you call quite late planting?

MR. FITCHETT: Well, we have planted as late as the first of August and got primary blossoms on the plant. We make our field planting usually about the first week of June. Our show ground is planted usually the middle or latter part of May, and there we have half a dozen plants of a kind, to show the different varieties we are growing.

QUESTION: What about fertilizer, when planting and later?

MR. FITCHETT: If you fertilize heavily when planting you are apt to get soft growing plants, plants that make a rank growth, and do not stand the hot weather so well. I am in favor of ordinary garden soil, and at planting time giving them top dressing, or fertilize just as they are getting into bud, getting the growth in the bloom instead of in the plant.

QUESTION: What fertilizer do you use?

MR. FITCHETT: I use barnyard manure. We have used commercial fertilizers, which I put around the plants just as they were coming into bud.

QUESTION: I should like to ask in regard to winter storage. I have heard that it is necessary to turn the roots upside down, so as to drain the moisture out, otherwise they will rot, is that right?

MR. FITCHETT: Well, I am not prepared to say whether it is a fact or not, I will say that we do not do it. We dump them into the bin, whichever way they will land.

MR. LIVINGSTON: What temperature do you have in the cellar?

MR. FITCHETT: From 40 to 45 degrees. Another thing, after we get our varieties in the cellar in the fall, if they come in wet, we have found fresh lime will take up the surplus moisture, otherwise the moist stems are apt to mould, and there is a chance of their rotting.

MR. MOYLE: You spoke of planting bulbs in August, do you refer to mature bulbs?

MR. FITCHETT: Yes, I would not advocate planting later than the middle of June, though we got splendid bulbs this year from stuff planted the first and second week, and even the third week in June.

MR. MOYLE: Do you ever practice dis-budding?

MR. FITCHETT: No. You will get much better individual blooms, but we aim to show only an average flower. We expect people to have only average plants, that they can take care of. We do, in a sense, practice dis-budding, but we do not practice it in the sense of pinching off the side branches, throwing the whole strength to a single bloom.

MR. ROE: Are there certain varieties that keep better in cut flowers than others?

MR. FITCHETT: King of the Autumn will keep well. George Walters has kept well. The extremely narrow petaled English cactus ordinarily does not keep well. Any dahlia will keep well if you will trim off the foliage, leave just the bare stem with the flower, then dip the stem in hot water about a minute. The reason a dahlia wilts so quickly after it is cut is that folks will leave the foliage on, and all the leaves are evaporating moisture, and the poor flower out of the end of the stem gets the last chance at the water, or the last that is in the stem.

QUESTION: Suppose you were a city man having only a small lot and wanted about half a dozen varieties, which ones would you recommend?

MR. FITCHETT: It depends a great deal on your preferences. If you want the old-fashioned show varieties, round, ball shaped, take the Robert (Grownville?) in white. Personally, I prefer the peony flowered type. Turner is a wonderful pink; King of the Autumn is a good decorative flower; Noble in red is a decorative, full blooming variety. In cactus, take Wodan, a soft salmon, growing lighter in the center. In the hybrid cactus, the curved large petaled cactus, we have not had anything to equal George Walters. Those we planted out on the front lawn in the middle of May, we had in bloom the last of July, and the same plants were in good bloom when the hard frost took them the second of November. We cut flowers from those plants about the middle of October. We cut flowers with stems nearly five feet long.

MR. TURNBULL: You spoke about putting lime in to take up the moisture. Is there not danger of bulbs drying out in an ordinary cellar?

MR. FITCHETT: If they dry out toward spring, then sprinkle with water.

MR. TURNBULL: I put mine in a barrel in an ordinary cellar, but I noticed on the top they wrinkled up. Would it not be well to put sand on them, or something to cover them?

MR. FITCHETT: After the moisture is out of them in the fall, then put newspapers on. The trouble with sand is, you cannot see what the bulbs are doing. By putting two or three thicknesses of newspaper, they will keep nicely. In the spring we sometimes find it necessary to drag the hose down and sprinkle the whole outfit.

QUESTION: Is there not a possibility of the lime injuring the bulbs?

MR. FITCHETT: We do not put the lime on the bulbs. Simply put it in boxes in the cellar, so as to take up the moisture in the air. Putting fresh lime on the bulbs would burn them.

QUESTION: Have you used coal ashes?

MR. FITCHETT: We have grown them in almost clear coal ashes. If I had my choice, I would take the heavier soil and lighten it a little bit with coal ashes. Sandy soil does not hold ashes so well. You need to mulch to hold moisture during the summer.

OUR NATIVE FERNS UNDER CULTIVATION

BY WM. TOOLE, SR.

We desire to have ferns growing about our homes, not alone because we appreciate their beauty of form and coloring, but also because they are reminders of the pleasure we have enjoyed, when seeing them in their natural surroundings on our drives through the country, or visits to shaded glens, rocky hillsides, or even when searching in the swamps for rare plants. It might seem as if we could not furnish suitable conditions near our homes where ferns could thrive after seeing them in their native surroundings, but experience has taught that many species may be successfully cultivated.

A generous amount of humus in the soil is desirable and woods earth should be freely applied where there is a deficiency. If farmyard manure is used it should be well decomposed.

Some shade is desirable, although many of them will live in the open, but in such a situation they lose their gracefulness. The north side of a building is desirable if not exposed to sweeping

winds. An ideal situation is a sheltered corner where an easterly extending wing, joining the east side of the main structure, forms a nook facing the northeast.

A real lover of ferns will surely wish to learn the names of the different kinds collected and planted. This is not difficult if one carefully studies the analytical key of some standard text-book of botany, such as Gray's Manual of Botany.

After learning names which have been accepted as standard one is often disconcerted by finding that some authors use a different lot of names. This applies not only to ferns, but other plants as well. I find in looking over a bulletin from the National Museum which describes the flora of the District of Columbia that our Lady Fern, which we long have known as Asplenium filix foemina, is named Authyrium asplenioides. The Ostrich Fern is named Pteritis nodulosa. Such changes are made with the names of many familiar species.

In this paper I shall use the names as given in Gray's Manual of Botany.

If one wishes to know ferns it is necessary to become familiar with a few botanical terms. Ferns are flowerless plants and instead of seeds they yield spores which are very minute reproductive organs. Fern leaves are called fronds. The leaf stem is a rhachis. The smaller divisions of the fronds are pinules. The parts which hold the spores are called sporangia, the clusters of spores, sori, the thin covering indusium.

With most species of ferns the sporangia holding the sori or spore clusters are found on the under side of the fronds. Many persons when first seeing the fruiting organs on the reverse side of the fronds have imagined they were the eggs of insects. A few of the ferns have the spore cases under the edges of the fronds as do the Maiden Hair Fern and the Brake. Others are more bud-like in appearance on the fertile fronds, as with the Osmundas, which are sometimes called flowering ferns, the Sensitive Fern, the Ostrich Fern and the Rattle Snake Fern.

One must become acquainted with the different fruiting forms of ferns when analyzing them to learn the names. With careful handling ferns may be transplanted whenever they can be found and identified. It is not generally difficult to find the Ostrich Fern, the Lady Fern and the Maiden Hair in early spring, be-

cause the dried fronds do not entirely wither away. Of course, the various evergreen ferns can be identified at any time.

In moving ferns it is necessary that the roots shall not be permitted to become dry from the time of taking up to replanting them. In taking up it is good roots more than soil that is desirable. In planting use the same care in firming the soil about the roots as for other plants.

It is sometimes the case that because of direction of wind at the time of storms plants near buildings fail to get their share of rain. In such cases watering at times becomes necessary.

Probably the Ostrich Fern—*Onoclea Struthiopteris*—is as easily grown as any and is a general favorite. In their native state they are usually found in rich alluvial soils, not far from springs or watercourses. The sterile fronds are graceful, springing up in a close circle from the end of a root stock, and arching at the top so that the vase-like form of the plant always attracts attention. The fertile fronds are much shorter, with bud-like pinnae. After maturity these fertile fronds retain their form and take on a rich, varnished-like coloring between mahogany and ebony. Given a place among dried flowers and grasses they are truly ornamental.

The Sensitive Fern, *Onoclea sensibilis,* is quite different in form of the sterile fronds. The fronds are scarcely fern-like in appearance, being not more divided than many oak leaves. The fertile fronds are much after the style of those of the Ostrich Fern, but smaller. They are found wild in damp soil where the shrub growth is open.

A common fern which is easily grown is the Lady Fern, *Asplenium filix foemina.* If grown in partial shade the fronds are very graceful in appearance. There is often some difference in the fineness of the division of the fronds. On some plants the rhachis is tinted red or purple, others are green throughout. Where there is plenty to choose from it is worth while to make a selection. The fertile fronds differ from the sterile in having the spore cases on the backs of the fronds. With us this species is quite common in open woods.

The Maiden Hair Fern, *Adiantum pedatum,* is often found in company with the Lady Fern. The form is quite different to the preceding. The shining black rhachis forks at the top and then break into several divisions, holding the pinnae to form a circular

flat-topped arrangement of the frond. The spore cases are arranged at the ends of veins, at the very edge of the lobes of the fronds, the edges of which are rolled under to form the covering called the indusium. The Maiden Hair Fern is a general favorite and is as easily grown as any.

Next in importance as desirable for the amateur are the Osmundas, sometimes called flowering ferns. The Cinnamon Fern, *Osmunda cinnamonea,* is not quite so tall growing or robust as the Ostrich Fern. The fronds are of a lighter shade of green, but somewhat resemble it. The fertile fronds are a bright cinnamon color, giving the name to the species. They soon wither away after the spores have ripened. Their native habitat is the shrubby borders of marshes or near springs.

The Clayton Fern, *Osmunda Claytoniana,* is usually found on shady hillsides. The fronds are not so finely divided as those of the Cinnamon Fern and are of a different shade of green. The fertile portions of the fronds are a few pinnae on each side of the rhachis, and look as if they had been shriveled with some disease. For variety this is a desirable fern.

The Royal Fern, *Osmunda regalis,* at its best is truly noble in appearance. In cultivation it will not equal in beauty those grown in the wild near the borders of swamps, but it is desirable enough to be well worth growing. The fertile portions are at the tips of the fronds and the clusters of spore cases do not improve the appearance. Where there is space to permit there are several other desirable ferns worthy of a place in any collection. The Bladder Ferns, *Cystopteris bulbifera* and *Cystopteris fragilis,* are very desirable. They make pretty house ferns in winter. The first, *C. bulbifera,* has long, slender fronds and has little bulblets attached to the rhachis. *C. fragilis* is not so tall as the preceding and the pinnae are more closely placed along the rhachis. They are both found growing among the rocks of steep hillsides and need a well-drained situation.

We have several evergreen ferns all found growing near or among rocks, and seem to seek well-drained locations. The polypody Fern, *Polypodium vulgare,* is usually found growing on the tops of shaded rocks and rarely otherwise. The fronds are dark green, straight up and erect. The fronds have somewhat the appearance of a short Sword Fern, but of a still darker green. A lady tells me she has had good success growing this fern in the

house in a shallow fern dish. Taken up in June it thrived through the following winter.

Two of the Shield Ferns, *Aspidium spinulosum* and *Aspidium marginale,* are valuable evergreen ferns. The fronds of each of these, especially the former, are gathered in quantities for use in the florist business. The first has very finely divided fronds, even more so than those of the Lady Fern. The fronds of some plants are more full and fluffy than others. The fronds of the margined fern are darker green than the other, but not so finely divided. They are both found growing among broken rocks, which indicates preference for a well-drained situation. Another useful evergreen fern is the Christmas Fern, *Polystichum acrostichoides.* This is found in rich soil in open woods and is plentiful in some places, but is rare in this part of Sauk county. It also is much used in the trade under the name of the dagger fern. The fronds are longer than those of the polypody, and even more resembles the sword fern. It adapts itself well to cultivation.

A very interesting evergreen fern is the Walking Leaf, *Camptosorus rhizophiylus.* This fern is found growing on the tops and down the sides of rocks and seems much attached to localities. I have known of one colony of them for more than fifty years. The fronds are dark green above and shaggy underneath. They are not divided. The taper-pointed fronds often take root at the tips and keep spreading out in that way, forming a close mat of green. I have had success with this fern on a shelf-like shaded bank. Another fern which might be classed with the evergreens is *Woodsia ilvensis,* although its general appearance in the mass is as much gray as green. This fern is found amongst and on exposed rocks in the sunshine. It seems to easily recover from dryness and would be an interesting plant in a rockery.

The *Phegopteris* or Beech ferns are pretty and may be used as fillers among the larger ferns. *Phegopteris dryopteris,* also called Oak Fern, is a low-growing fern with a triangular spreading surface. *Phegopteris hexagonoptera* is a little taller than the preceding and broadly triangular. Both are usually found in like situations usually at the base of steep, rocky situations. It would be difficult to succeed with ferns which grow in clefts of rocks, such as the Cliff Brake, *Pella atropurpurea,* and the *Asplenium trichomanes.*

Of the several Moonwort Ferns we have *Bobrychium virginianum,* also called the Rattle Snake Fern. This fern throws up but a single stem or rhachis and is so deeply rooted it is taken up only with difficulty. The true Brake, *Pteris aquilinia,* rambles so far with its long, black rhozimes it could not be kept within reasonable limits.

DISCUSSION

MR. MOYLE: What ferns would you recommend for planting on home grounds?

MR. TOOLE: The three Osmundi, if grown in the right place, grow plentifully. I was quite pleased to find a good colony of the Ostrich fern last year, when some friends were fishing, and I was hunting for other things, I went nearby, where I could find the walking fern. I much admire the Ostrich fern.

QUESTION: How would you instruct an amateur starting out with planting ferns to take care of them, supposing you plant them on high land around your house?

MR. TOOLE: I suppose it will have to be learned by a slow process and with a whole lot of sympathy in getting them to grow. In my case, loving ferns and all plants, I simply commenced, took my Gray's Botany, I did not learn much at first, but I will say to anyone who begins to make a study of plants, and becomes interested, each little bit he learns makes the way much plainer toward the next step. Then again, you will become, after a while, familiar with certain characteristics of plants, that even a stranger will classify at a glance, noting a general resemblance. This remark applies to plants in general, as well as to ferns. I want to urge as many of you as possible to study our native plants, and while you will perhaps be obliged to use the botanical names to fix them in your mind, it becomes less difficult when you learn more about them.

QUESTION: Most amateurs labor under the impression that ferns require more water than ordinary plants. How about that?

MR. TOOLE: With my experience, I think not. They are, of course, different in the wild state. You will find ferns that suffer hardship during dry times. They will suffer, but they will recover if you only give them half a chance. On the other hand, it is not necessary to keep them as wet as some people might suppose.

MR. TYRRELL: Why do they tell us to plant them on the north side of the house, in the shade?

MR. TOOLE: Because they do not seem to bear too much exposure, or too strong sunshine to do well and carry on the slender

growth. You know the quality that we admire in many things is slenderness. That is what we call gracefulness, and you will find that native ferns planted in sandy soil will be stiff and straight, and they do not have the grace that they acquire in the partially shaded situation.

THE NEW PEST REPORTING SERVICE

By S. B. FRACKER, *State Entomologist.*

For years the Bureau of Crop Estimates of the United States Department of Agriculture has been publishing every few weeks figures regarding the production and value of agricultural crops. One of the most important features of this service is the forecasting of crops which are still in early stages of development.

These estimates usually do not list any causes for reduced crops and do not indicate whether insect pests, plant diseases or climatic conditions are responsible for the varying returns from year to year. Occasionally one of their reporters will recognize the effect of an unusually heavy outbreak of potato bugs or grain rust but even then only a small amount of reliance can be placed on the report. One of the most common mistakes in these estimates is the failure on the part of the reporters to distinguish between the result of climatic conditions and that of pests, confusing the effects of hot weather, for example, with those of rust in grain, or hopperburn in potatoes.

Consequently in 1920 we established in Wisconsin what we called a Pest Reporting Service, with two primary objects in view. First, it was thought that many reports of serious outbreaks would be received in time for the department to send assistants for controlling the trouble. Second, we needed information which could be made a permanent record and placed on file for the future study of the conditions which bring out extensive outbreaks of pests and diseases.

Those who have attempted to determine the causes of widespread losses from grasshoppers, chinch bugs, Hessian fly, army worm and similar pests have found that there were no accurate records in any state which would indicate the years in which such outbreaks occurred, the areas they covered, the amount of damage resulting, or the year in which the numbers returned to normal. Accurate methods of measuring the number of insects present for

comparative purposes are still lacking but the new pest reporting service has pointed the way to a means of giving great future service to those whose livelihood depends on the production of agricultural or horticultural crops.

Last spring, a year after this service was established in Wisconsin, the United States Bureau of Entomology organized a similar line of work to cover the entire United States and started the publication of an Insect Pest Survey Bulletin which lists each month the insects attacking crops in the different parts of the United States. The survey for the United States as a whole is particularly valuable in letting the northern states know how various insects are developing immediately to the south, thus giving them a chance to be prepared for the same troubles later on.

The results so far have been more important in locating the exact area covered by insect outbreaks than in listing new ones of which we had not heard. In many cases other letters have shown the presence of pests in alarming numbers before the reporters in the same section of the state sent in word, but mapping the total number of reports each week has been a very valuable addition to our information and has enabled us to give much better assistance.

In order to arrange for reporters we took lists of the members of the State Horticultural Society, the State Potato Growers' Association, the Wisconsin Experiment Association, and the commercial market gardeners, thus securing representatives from all the principal agricultural and horticultural industries. A list of about two-hundred and fifty names was then chosen and blanks were sent out each week or ten days to one-fourth of the list. Each reporter is thus asked to send in reports only once a month but the office received one report from each county each week. The response has been very gratifying and encouraging. One of the first results of this service was the report of an outbreak of the cherry slug in the cherry orchards in Bayfield county in 1920. This common insect had previously been negligible in that area and many growers did not know how to handle it. The report was received in sufficient time to enable us to get directions for arsenical spraying to a considerable proportion of the growers. Previous to that time a fungicide had been the only kind of spray material applied, as arsenicals had not been necessary.

During the season of 1921 insects have been particularly severe and injurious. The Colorado potato beetle covered the entire state and had never been seen in such large numbers before. The first brood was reported in twenty or thirty counties as early as May 21, extending from Sawyer and Vilas counties in the north to the southern border of the state. The adults of the overwintering brood also appeared extremely early and the exaggerated reports of the large numbers of this pest which went into winter quarters in the fall make interesting reading.

The grasshopper outbreak, which received considerable publicity, was again confined to the northeast counties with the greatest losses in the northern half of Door county. Fortunately, previous experience with these pests made many familiar with them and large quantities of poison bran mash were used with good results. The only thing which prevented the control from being used more extensively was the fact the grain crops, the principal subject of attack, were nearly a failure from other reasons in some of the more heavily infested sections.

The potato leafhopper, which has been causing a serious amount of hopperburn in the southern and central part of the state for several years, this season did an unusual amount of damage in the commercial potato growing sections. The application of Bordeaux mixture, although it had been given only a small amount of publicity, received extensive try-outs with more or less satisfactory results. Considerable difficulty was encountered in getting the mixture to the under sides of the leaves with the equipment being used in most of the commercial potato growing areas.

Finally, to close the season with a fitting climax, the corn ear worm attacked late sweet corn and in a few cases some field corn with such unexpected violence and in such large numbers that many thought the Eureopean corn borer had surely arrived. Throughout the entire southeastern quarter of the state reports were received in large numbers of cases in which one-half to three-fourths of all the ears in the home garden had worms in them. Wisconsin is so unaccustomed to having to fight this common pest of the states a few miles farther south that the growers were caught unawares and had made no attempt to protect themselves. Many of them have now become familiar with protective measures and if this insect appears again next year will dust the silk of the sweet corn with powdered arsenate of lead.

Pests of lessor note during the season but which may be responsible for serious permanent damage were the canker worm on the apple trees in the spring and the strawberry root worm, in midsummer, the latter particularly injurious in the sections which produce progressive ever-bearing plants.

The canker worms were the cause of complete defoliation of a large percentage of apple orchards in the area south of Madison and Milwaukee. They left the shade trees alone throughout most of this area except around Oconomowoc. While the apple orchards promptly produced another crop of leaves as soon as the canker worms had pupated, it is questionable whether many of the orchards will be able to sustain repeated loss of their leaves in this way. The apple is said to succumb to three or four defoliations in successive years. For many of the orchards, 1921 was the second season in which they had submitted to this injury. A brief survey by Mr. Chambers and the writer in early November showed the familiar moths laying eggs in many places for the spring brood of worms.

The number of spray pumps in this area which has no commercial orchards of any consequence but in which hundreds of farm orchards are growing, is entirely inadequate to protect against a canker worm outbreak. The county agent of Jefferson county is making progress in organizing spraying rings in which a number of farmers join together in the purchase of a power outfit. This form of work has been especially successful in Iowa and the results in Jefferson county look promising.

The widespread infestation of the strawberry root worm in the entire western central part of the state west of the Wisconsin River and north as far as Eau Claire, had been forecast for several years by the finding of occasional infested strawberry beds. The numbers this season were, however, greatly in excess of anything reported before. The root worm, when present in large numbers has an effect on the plants somewhat similar to that of white grubs, although the larvae which do the damage are very much smaller and occur in large numbers on each plant. They become small adult beetles in August and feed on the foliage during the remainder of the season, causing typical small round holes. The principal danger of transporting them into new localities is in the shipment of plants in the adult over-wintering beetles may hang to the foliage or which attach their eggs to the crumpled

leaves. It was necessary to require an affidavit from practically all the producers of everbearing strawberry plants in the infested area providing for the thorough cleaning of all plants sold during the coming season. Fortunately, the strawberry growers of the Fox River Valley are still without this pest.

The hearty cooperation of the many fruit, potato, pea, cabbage and grain growers who have reported regularly on the insect pests in their neighborhoods is heartily appreciated. The only return we can offer them is that which is available to every resident of the state, namely, the department bulletins, but their service will eventually be valuable not only to themselves but to all other producers.

DISCUSSION

QUESTION: Does the canker worm attack the leaves or flowers?

PROFESSOR FRACKER: The canker worm strips the leaves completely in sections.

QUESTION: What do you use to spray with?

PROFESSOR FRACKER: Ordinary arsenate of lead sprays will control it, and it is never serious in an orchard if it is being carefully treated every year for the codling moth. It comes very early in the season, and as a rule the early arsenical sprays will be completely effective in controlling it.

MR. KELLOGG: For relief from the corn borer, is there any other method of prevention than that spoken of, powdered arsenate of lead?

PROFESSOR FRACKER: It is one of the most difficult things there is to combat.

MR. KELLOGG: In some sections of the state the corn ear worm almost entirely destroyed the crop. In my own case, I will say that while we used a field corn for silage this year, it would be no exaggeration to say that on some ears we would find some two dozen worms in all stages of development, from very small up to an inch in length. Some people said it was a lack of fumigation of the seed.

PROFESSOR FRACKER: No, I think that the principal source of encouragement there is that it is a native pest, and will undoubtedly come only in cycles, only occasionally. If it were going to go on continuously and do a great deal of damage in the future, it would have done so already. It has been with us all the time, but our long seasons for the last two summers, our mild winters coming in between, have enabled the pest which is normally only

serious in Southern Illinois, Kansas, Southern Iowa, and Northern Missouri, to attack our corn even more seriously than it has down there. Just as soon as we have normal seasons again, shortening up the summers and cutting off practically one brood, it would materially reduce the numbers of the ear worm to such an extent that we do not need to fear it. For those who are not quite clear on the subject, I will say that this is exactly the same pest which will bore into the tomato. It is also known as the tomato fruit worm, and we had reports of worms boring into tomatoes this summer from up north, as far as Outagamie county. We were also interested in an exhibit in Milwauke county. A large greenhouse proprietor had a new pest in his rose beds, and we found on treating it that it proved to be the same as the corn ear worm. These worms had gotten into the greenhouse and were boring directly into the buds of the roses in exactly the same way as they were boring into tomato fruits and into the ears of corn. Of course, they were very much relieved to discover what it was, in spite of the amount of damage it was doing, because they were glad to know what it was.

MR. SMITH: Up our way 1920, we had in our cabbage a worm which looked to me identical with the corn worm. We have had the corn worm up there the last ten years.

PROFESSOR FRACKER: The corn ear worm is a general feeder. I have never seen it occurring in the cabbage. I might mention that the European corn borer, which we are all afraid will enter Wisconsin sometime in the future, has worked west from its location at Boston, where it has been known four or five years, until now it is in the entire north tier of townships of Ohio, through Ontario, on the north side of Lake Erie, almost to Detroit, and no control measure of any value whatever has been worked out with respect to it yet, and if there is anyone who finds any insect boring in the corn, actually in the corn-stalk, or in the cob of the ear, instead of eating from the outside, they should be sent to either the state or United States Department of Agriculture for identification. In case it arrives in Wisconsin, the sooner we know about it the better, because a small infestation might come in which could be handled in case it was discovered and reported in time.

THE WESTON FIRE BLIGHT CONTROL PROJECT

E. L. CHAMBERS

In the development of any industry we find ourselves being constantly confronted with perplexing problems which frequently become so great a menace as to threaten its existence.

One by one, the majority of these problems that have arisen in the fruit growing industry have been met and solved after a considerable period of careful study and experimentation, until today we have a definitely arranged spray program mapped out with the specific remedies for each pest and the essential time of their application so well combined that it is a comparatively simple matter to control the host of enemies in a very few operations.

One of these pests, however, a disease known as fire blight, has stubbornly resisted all of these treatments. It is by no means a new disease, having been recorded as being injurious in our northeastern states some fifty years before the Revolutionary War. Many theories as to its cause were advanced. Burril in 1880, however, proved definitely that it was caused by a germ, a bacterium, which he has given the name of Bacillus amylovorus. Its activity takes place within the tissue of the tree beyond the reach of any of our external control agents.

Although this organism is a germ much like our typhoid bacillus and others which we have been able to control in the human system through the agencies of vaccines, yet in spite of many claims to the contrary we cannot use vaccines in trees, since having an entirely different type of circulation, we have no means of reaching it. The only course left for us to pursue then is that of pruning out the diseased parts of the less susceptible varieties and digging out and destroying of the more susceptible ones. Fire blight is one of the most serious apple diseases we have in Wisconsin, making its first appearance sometime during the early part of the growing season, usually a couple of weeks after the blossoms appear. The first evidence of the trouble is the brown and subsequent blackened appearance of the young leaves and the blossoms, from which the disease extends rapidly into the fruit spurs.

It thus prevents the development of the fruit and then continues to spread to the larger twigs and branches and thence into the trunk. During the growing season while the trees are green, these blighted twigs and branches have the appearance of being partially burned, making its detection simple.

At the termination of the growing season the germ becomes inactive and dark and discolored areas are separated from the healthier and greener portions by a sharp line of demarkation, showing the approximate limit of the infection. These areas surrounded by healthy bark are spoken of as "cankers" and commonly as "hold-over cankers" because it is at their edges where the tissue does not dry out that the bacteria are kept alive over winter. In early spring, sap laden with these organisms is exuded from the diseased parts in small droplets. This substance upon exposure to the air changes into a dark brown or black gum which is very attractive to insects.

It has been established that this disease is spread to a great extent through the visits of the insects. It can only enter the tissue of the tree through a wound, an insect puncture, or through the floral nectary. Since areas with neglected and diseased trees have on their surfaces a considerable amount of this disease laden gum exposed to the visiting bees and since they visit practically every blossom it is not difficult to account for its rapid spread.

Besides this method of infection we must, of course, consider that of introducing the organism into the sap through our methods of cultivation and by means of the prunning knife and saw. But once we have removed the chronic cases which serve as constant centers of infection we can reduce the former to a minimum and by proper care in sterilizing all tools used with mercuric cyanide (1-500) we can regulate the latter.

As previously mentioned the only control for this blight consists is the removal and destruction by burning of all of the diseased parts. When the disease reached the west coast a few years ago it found the environment ideal for its development and in many sections of the country made the growing of the pear and certain of the varieties of the apple impossible. Something had to be done, so attempts were made to clean up small sections of the fruit belt and through co-operation they were able to secure the removal of all of these diseased trees within the proper clean-up area with the result that today they are again growing these

former varieties of apples and pears in the same section without any appreciable amount of fire blight, if any.

We have here in Wisconsin one of these ideal fruit sections which has proven its worth and now is so infested with diseased and neglected trees, that the growing of the varieties best adapted for the locality has become next to impossible because of their susceptibility to the disease. This area is located in the vicinity of Hatchville and includes parts of St. Croix, Dunn and Pierce counties. It is a relatively high table land with an abundance of ideal slopes and sufficient valleys to give excellent air drainage and thus gives a reasonable insurance against the late spring frosts. Besides a considerable number of small orchards, there are located in this region the State Horticultural experimental orchard of the Society, and the orchard of the Western Orchard Company, which alone has something over 125 acres in apple trees.

With several comparatively mild winters during the past few years, probably more of the diseased cankers have been permitted to live over winter than usual and this coupled with the extremes in uneven seasons has had a tendency to stimulate rank growth favorable for the development of the blight all over the state, causing alarm among the fruit growers.

At the request of the county agents in the previously mentioned counties concerned, and no less than a dozen of the fruit growers of this section, the Department of Agriculture investigated the situation and decided upon a clean-up project in hopes of saving and restoring this valuable fruit section.

A course similar to that used so successfully in the west was decided upon and the work begun in the spring. An area of over thirty square miles was undertaken, extending about three miles in each direction from Hatchville. An attempt was made to secure the cooperation of all of the farmers in this area in the destruction of their diseased trees. We insisted upon the removal of all of the crab apple trees since they are all so susceptible to the disease, and the worse of the more susceptible varieties of apples, and the pruning out and burning of all of the dead and diseased branches and twigs remaining. The work was only carried on a short time in the spring and was again taken up this fall. At which time a meeting was held at the Weston Orchard, and Dr. S. B. Fracker, the state entomologist, and Dr. R. E. Vaughn, a pathologist of the extension department, explained the project

and discussed the disease. Since all of those concerned were not present at the meeting a copy of the Dunn County News, containing a complete report of the meeting, was sent to each of the property owners in the proposed area. Mr. Hughes, the Dunn County county agent, also sent them each a letter of explanation and urged their support. These parties were then personally visited a little later and their trees gone over with them and the disease shown them and the dangerous trees pointed out, and their promise of cooperation in their removal secured.

In quite a few cases these trees were removed while on the ground, but most of them preferred to remove them at their leisure, giving various reasons for it. Of the seventy or more farmers visited, some 2,600 trees were listed of which 109 were crab apples and the majority of the Transcendent variety. The Weston Orchard Company had given the project a good start by the removal of all of their crab apple trees, about 300 in number. Every owner of one of the susceptible trees made a definite promise to remove them by spring.

Although there seemed to be quite a bit of misunderstanding, and in some cases, misrepresentation among the farmers, we found most of them very much interested in our proposal and willing to support it, some hesitating to see if the rest would do it first, but later falling in line.

Among the most susceptible varieties of apples which we urged destroyed rather than to attempt to prune were the Yellow Transparent and McMahan. While the Wealthy is a susceptible variety, over-wintering cankers do not occur on it to a serious extent, and since it is the best adapted variety for this section, one of the objects of the work was to protect it from repeated reinfection. The Northwestern Greening, on the other hand, seems less susceptible to the disease.

Too much emphasis cannot be placed upon the importance of care in pruning, since it is necessary to prune several inches back of the canker to insure the removal of the entire infected area, besides sterilizing the tool used after each cut.

We hope that we may attain equally as good results as have been obtained in the west with the solid cooperation of this area in the next year or two, by removing the centers and pruning out the minor infections and not re-setting any more crab apples or of the more susceptible apple trees for the time being.

DISCUSSION

MR. RASMUSSEN: You mention cutting out crab apples. Do you mean all varieties?

MR. CHAMBERS: All varieties. The Whitney, of course, we do not consider a crab apple. We have not been able to find out that there is any difference in crab apples. Almost all of them we have found to be susceptible to the disease. Of course, the Transcendent is the worst.

MR. BARTLETT: It is my experience that you can control by pruning, without cutting out the crab apple trees. This summer I went over and pruned some trees five times, each time cut off a new infection and cut a foot below. Toward late fall I did not have any blight at all.

MR. CHAMBERS: This would be true, of course, if taken in time. Those that we were speaking of, our old Transcendent crab apple trees that are fifty to sixty years old, and disease has gotten into the trunk, the place to prune them, of course, is down in the ground.

MR. KELLOGG: The efforts toward the reduction of blight are probably most important in those sections of the state where they are doing commercial orcharding. I have been through the territory that Mr. Chambers describes, the Weston orchards, and they are the largest among our orchards, and it would be very apparent to anyone who visited that locality that the only method to control blight in that case would in many instances mean the extermination of many of the trees that were growing there, but those who will follow the recommendation of pruning out on the newer planted orchards, I do not think you need to restrict, or at least not to cut out all the crab apples, because I think some varieties are not any more susceptible to blight than some of our commercial varieties of apples, and if the trees were taken early, before the disease has made itself a home in the heart of the tree, you can weed out the blight.

THE SECRETARY: I am wondering if the impression would prevail with this audience that in order to check blight you must eliminate all crab apples. Am I right in that?

MR. CHAMBERS: Well, no. Yes and no. If the crab apple trees were taken in time and disease pruned out, why yes, but if the cankers were allowed to form in the trunk, it is next to impossible to prune them out.

THE SECRETARY: That would be true of pretty near all our established varieties of apples.

MR. CHAMBERS: Yes, but the crab apples are more susceptible than these other varieties.

MR. MOYLE: In the Poplar orchard you know we have never had any blight, and in that orchard the crab apples were better this year than anywhere. Of course, we would be putting on rather a broad interpretation to say that we should destroy all the crab apples of the state.

MR. RASMUSSEN: I think we ought to agree to cutting out the Transcendent, but I was wondering how far we would get in the state if we would recommend cutting out all the crab apples. I am afraid we would be getting into deep water.

MR. CHAMBERS: You understand this was experimental, this was just tried out here to see whether it would be done in this section, and we may find other crab apples that we can replace those varieties with, but the idea is to be sure that we remove all chances of infection.

MR. KELLOGG: In discussing this matter of blight, some of our friends may feel that we are going too far in trying to eliminate all varieties of crab apples. There is no question but what there is no greater culprit throughout those sections where blight has made itself felt in the apple growing districts than the Transcendent crab, at the same time because of the damage the Transcendent has created, it is not wise to censure all the crab apples, any more than to lock up all tree men just because one or two have sold some trees that did not correspond with the order blanks.

REPORT OF THE TRIAL ORCHARD COMMITTEE

W. J. MOYLE, *Chairman.*

The last week in July found the committee en route by auto on its annual inspection tour of state orchards. It must be remembered that these orchards, ten in number, have been planted at different intervals during the past 15 years, in different localities throughout the state.

The principal object at the time of planting the larger orchards being to establish the advisability of commercial orcharding. While the smaller orchards were set out to test varieties.

The Manitowoc orchard was considered a commercial proposition. The orchard committee was lucky in securing the services of Mr. Drews in looking after this orchard. Location is fine, being on the shores of Lake Michigan and the soil is good. Varieties are all right if they had been what they were bought for, Wealthy, Northwestern Greening and Fameuse. But, alas, for the cupidity of man and particularly the nursery man.

Our genial superintendent of orchards was loaded up with Winesap trees for Fameuse and an unknown variety slipped in occasionally in place of Northwestern Greening to make up for shortage. Verily these nursery men often stray from the paths of righteousness. Here I am reminded of Mr. Dooley who said on reporting a saloonkeepers' convention, a delegate got up and moved that if there was an honest man among them to "Put him out, he's a spy."

This orchard has had excellent care during the season and a nice lot of Wealthies were hanging on the trees. We look for this orchard to hand in some very favorable reports in the next few years. Notwithstanding that Winesaps grow about the size of crab apples in Northern Wisconsin.

The orchards located at Maple and Poplar on the Superior shore are valuable object lessons to the people in that part of the state. Maple, while situated on higher ground, has not proven as successful as the orchard at Poplar. This is attributed to the fact that the Poplar orchard has been thoroughly tiled and drained.

Maple was struck with a terrible hail storm two years ago and much to our surprise we found the trees had practically outgrown the damage done and were carrying a fair crop of fruit.

At Poplar was found the most productive of all the trial orchards. A large crop of Hibernal and a nice crop of Duchess and a whopper crop of Hyslop and Transcendent crabs. These crab trees have never been known to blight. This orchard has produced some very remunerative crops of fruit, as the books of the society will show, and can be pronounced a success in every way.

At Holcombe is situated one of our younger orchards. Conditions were ideal there the past year. Trees are looking fine but need some pruning.

At Weston, our pet orchard, we are glad to report as almost entirely recovered from the badly blighted condition of last year. The care of this orchard has been neglected the past season, resulting in considerable leaf scab, and mildew, particularly on the McIntosh.

At Whitehall, the finest looking orchard in the state, we found no fruit at all, due to the severe freeze of last April. We advised the plowing and cultivation of this orchard with a tractor.

We found a similar condition at Gays Mills, with a very light crop. Here in this orchard the McMahan has been under culti-

vation for a considerable period and at present is taboo on account of its tendency to blight.

The Baraboo orchard, a small planting, is composed mostly of newer varieties just coming into bearing. Trees were looking good, but season had been pretty dry.

At Lake Geneva is situated what is supposed to be a commercial project, but here the varieties were again badly juggled, much to the disgust and chagrin of your worthy committee. This orchard has arrived at bearing age for reasons over which expert horticultural doctors disagree. It has proven a lemon. The committee advises that every effort possible be made to discover the requirements necessary to bring this orchard into a productive, profitable condition.

The Pewaukee orchard, a small planting, is nicely located and well taken care of. The trees are thrifty and should begin to produce some fruit in the near future.

Respectfully submitted,

L. G. KELLOGG,
N. A. RASMUSSEN,
W. J. MOYLE,
Committee.

REPORT OF SECRETARY

(From Reporter's Transcript.)

MR. CRANEFIELD: Mr. President, Ladies and Gentlemen of this Society:—I intended to submit a written report. I will talk a few minutes, although somewhat handicapped in that respect. Those of you who have read that delightful story of Kim, by Kipling, will recall that the little castoff boy in the slums of a great city of India, who afterwards rose to a position of considerable importance, asked himself some questions: "Who is Kim? Who are you? Why are you? Who is Kim?

Now, it seems to me that by this time all of us can reasonably ask this question: "What is the Horticultural Society? Why is it? What is it for? What does it do?" As we meet here in convention, we come mostly and properly to listen to the papers and discussions and reports, but it seemed to me that the average member of this society is unacquainted with the workings of the society. The average member has not stopped to think beyond

the convention. Who is Kim? What is the Horticultural Society? And so I shall enter into some detail this morning as to the conduct of the society, its affairs, and so on. A little introspection will not harm us. I will aim to tell you some of the things that every member ought to know, as well as the executive committee and the officers.

The society is today practically fifty-six years old. It is not an infant. It is the legitimate successor of another society organized in 1853. It was chartered by the State of Wisconsin by special enactment in 1871. It is the foster child of the State, a sort of stepchild. We subsist by appropriations from the State. We have approximately 2,500 members. Seventeen years ago I recall that we had 111 members. I cannot forget that number, because it is alliterative, 1-1-1. Of these approximately 2 per cent are commercial fruit growers. I want you to remember these figures if you will, and remember them as approximate figures. Only 2 per cent of our membership are people who make their living wholly by growing trees or small fruits. Approximately 20 per cent are market gardeners and small fruit growers, who derive their incomes wholly or in part from growing fruits; 78 are amateurs or beginners. Let me repeat those things exactly in round numbers, 2 per cent commercial fruit growers, 20 per cent those who derive their income in greater or less degree from fruit growing, and 78 per cent amateurs and bee keepers. What do we do? We hold two meetings a year, this annual convention and a summer meeting. These meetings do not comprise any large part of our work. They are valuable to those who attend the meetings, and to a lesser degree to those who do not attend but read the proceedings as printed in the annual report. I feel free to say that our two conventions are not any large part of the work of the Horticultural Society. We publish a monthly magazine, it is distributed to members and members only. That is not any large part of our work. It is one part of our work. But then, what do we do?

Our field work, as covered by the trial orchards and the newer established small fruit stations comprise the major part of the work, and has for twenty-five years. I cannot enter into any long description of that work, but it is all on record in our reports and other publications. You have just listened to a report of the trial orchard committee, which was illuminative and fair, and

gives you a good idea of the work as conducted within the past year. We have established four small fruit stations in order to demonstrate that small fruits can be grown profitably in Wisconsin. By a recent act of the executive committee, that work will eventually cover the entire state, as funds permit.

We issue an annual report. One of our older members said a while ago that we do not advertise the reports. Why should we advertise except to secure new members? It contains on the first page fruit lists, not haphazard lists, but lists prepared by committees of experts, who sit for days in my office and revise and revise again. The report is eagerly sought for by libraries and horticultural societies in the United States and foreign countries for those fruit lists. We distribute from 25,000 to 50,000 leaflets each year containing those fruit lists and mention of the activities of the Society. The average member never sees those lists, there is no need to send them to him, we send them to others, it is our publicity work. Our office correspondence, what I call "First aid to the injured," answering letters that come in, comprises several thousand letters during the year.

We have an annual appropriation from the State of Wisconsin of $9,000.00. That is a continuing appropriation, one of the very few of the State of Wisconsin, we are priviliged in that respect. Our appropriation stands on the books until increased, diminished, or wiped out. We are called on every year to tell how that money has been spent. Our membership fees averaged during the past five years $780.00 a year, which sounds inconsistent. Our receipts for the past five years from other sources have averaged $1,500.00 a year, making a total income of a little over $11,000.00. How is it spent? You are entitled to know that. I cannot go into the details of that work. In general, there is spent for salaries, office rent, and upkeep about $4,300.00 a year. There is one hired man on the job, that is the secretary. The president and the vice president, by virtue of being members of the Board of Managers, spending considerable time during the year, each receive an honorarium of $75.00 a year. The conventions cost from $2,000.00 to $2,500.00 each. The annual convention, last January cost $1,346.77, of which $566.00 was for premiums. We are sometimes criticised because we pay the expenses of so many people to the convention. If we pay those expenses, we obtain something in return, and sometimes a great deal more than we receive, and

the whole amount is $467.00. The annual report costs from $1,000.00 to $1,200.00 a year. Our paper costs us now about $1,500.00 a year, $125.00 each month, miscellaneous expenses about $2,000.00 a year. Wisconsin Horticulture finances itself. Not one dollar of the state appropriation has ever been spent on Wisconsin Horticulture, except that credited to its editing. We charge against it the printing and the paper on which it is printed, engraving, envelopes, addresses, mailing, we charge nothing for editorial service against the paper. We credit the paper with membership fees recived, and all advertising, and until two years ago we were ahead of the game. The expense increased from 1917 on. We now are beginning to see daylight, to see where Wisconsin Horticulture can stand alone. I mention in this connection my eternal gratitude to the members of this Society who responded to the "S. O. S." call sent out last year, when we told them that we were in need of money, and they responded with fifty life memberships at ten dollars apiece, by means of which we provided $500.00 to pay for the paper.

So far as Wisconsin Horticulture is concerned, the character of the paper, I proposed the establishment of the paper nearly twelve years ago at our summer meeting in Bayfield. At that time it was a little leaflet of eight pages, it was the official organ of the Society, and contained only horticultural information as related to Wisconsin, an official leaflet rather than a horticultural magazine. The pressure from outside on the editor has compelled him to make this a horticultural magazine, or attempt to make of it such. You were not satisfied with the early issue, the reading public was not satisfied, so, rightly or wrongly, it has grown year by year, so that it is now really in the publishing field, it is a horticultural magazine, containing information on every phase of horticulture. Now, whether that is right or wrong, I have often wondered. Yesterday, from the suggestions offered, I began to conclude that it was wrong, that you do not want a horticultural magazine, that you want a smaller paper which comes directly to you and meets directly your problems, the A. B. C. of horticulture, and in that I am vastly encouraged by the hands up yesterday. I feel that there is now a new era opening for Wisconsin Horticulture. A little less than fifty of you promised with the right hand up to help make Wisconsin Horticulture a better magazine. I shall announce it on the front page or on the editorial page of the com-

ing issue, and I shall expect those contributions from day to day. If you do that, if you help the editor to make the magazine what you want it, it will be what you want. In that connection, it perhaps is not proper for me to mention, and yet it cannot be improper, that in looking over the field of horticultural magazines in the United States there come to my mind one or more that contain practically the same amount of reading matter as Wisconsin Horticulture. There is one that stays in my mind. It is a good paper, it is of course a much better paper than Wisconsin Horticulture, and I trust you will believe there is no tone of sarcasm in what I have just said, but there is a good and sufficient reason for the quality of that paper. The editor of that paper is a part owner and draws out of the business $10,000.00 annually, the managing editor draws out anywhere from $5,000.00 to $6,000.00, and so does the advertising manager and circulating manager. The overhead of that paper is not less than $25,000.00 a year. I wish there were some arrangement by which the Horticultural Society could spend $25,000.00 a year on the magazine. I wish even more than that, that there were some arrangement by which the editor could be relieved of the duty of periodical inspection, correspondence, conventions, or whatever else there may be, so that he could devote his entire time to Wisconsin Horticulture. That would be a fine thing. Then every member of the Society could have a magazine that would be really worth while. But when we think of that we raise the other question, has the Horticultural Society any business to enter into the publishing field? Positively, it has not, according to my opinion, so let us be modest and let us be contented with what we have and let us all help to make it a little better. As I said yesterday, the magazine is advertised as a sixteen-page paper, we hope some day it will be twenty-four pages. It contains a little advertising. Getting advertising is a separate work by itself, requires special skill, and a great deal of time and attention. We cannot establish a $10,000.00 a year advertising service. I do not say these things by way of defense or offense, I am merely here to tell you the facts, which have not often been told you. From September, 1910, to December, 1921, there have been sixty-eight extra pages, not counting the supplements which have been issued, 10,000 to 25,000 copies each.

THE MACHINERY BY WHICH WE OPERATE

We have a president, executive committee and board of managers. The president is the chief executive, exercising functions which usually go with that office, the executive committee consisting in the past of one officer and one member from each congressional district. They shape the policy of this Society. I do not want anyone to get the idea that the secretary or board of managers shape the policy of this society. The board of managers is an ad interim committee, performing the duties of the executive committee during its absence, and consists of the president, vice president and secretary. It audits all the bills, it does all detail work of the Society. I could enter at some length into the question of auditing bills, telling you how easy it is to get money into the state treasury and how difficult it is to get that money out.

One of the best lines of endeavor, the one particular strength of our Society lies in the local societies. It was mentioned incidentally yesterday that we have half a dozen local societies. We have twenty-one local societies, with the prospect of many more in the near future.

What I have said so far concerns yesterday and today. What of tomorrow? What is the future of this Society? It is whatever you make it. It is not whatever the officers intend or want, it is what the 2,500 members of this Society will make it. That is the only answer that I can give to this question. A modern writer much in vogue now, a Frenchman, whose book I have read lately, makes the statement, that all people in the world are ruled either by their material interests, gain of money, fame, position, or by their passions, love and hatred. Are you willing to subscribe to that doctrine? I am not. Are we as horticulturists ruled entirely by those interests? If we are, we had better quit today and never come back. We are ruled by our interests, which is proper and right, as every good citizen is ruled, but I know of no member of this Society but has given something more than that, and has forgotten, for the time at least, his material interests. I should like to have you ask the majority of members of this Society, the older members, those who have devoted a lifetime to this work if it is true that we are ruled only by our material interests, or by our passions.

Will the Wisconsin State Horticultural Society survive another fifty-six years? Yes, if you follow the plan that we have been following, if it is actuated by the same spirit that is present now. It will not if we subscribe to that materialistic doctrine which I have mentioned. It will only survive, grow and flourish just to the extent that each member gives as well as receives. It will depend upon the one thing, which is the new religion of this age, the religion of service, not only in this Society, but throughout the nation and throughout the world. The doctrine of the Fatherhood of God and the Brotherhood of man has existed for these many thousands of years. We have never any of us denied the Fatherhood of God, but in times past we have sometimes forgotten the brotherhood of man. Let us as horticulturists keep that side in view. Let us dedicate this Society to this work, the service of the brotherhood of man, and it will survive for many times fifty-six years.

BETTER RELATIONS BETWEEN COUNTY AGRICULTURAL AGENTS AND THE SOCIETY

MR. W. E. SPREITER

(From Reporter's Transcript.)

I will briefly tell you what we have been doing in La Crosse county. Every year we go to the state fair with exhibits, and every year we have been taking low scores on fruits and vegetables, and we soon began to realize that we would have to bolster up those departments, and naturally our attention would turn to the Horticultural Society and the College of Agriculture. In trying to overcome our difficulties, we found that we would have to form some sort of organization. That we could not go out single handed and get the best results, so about a year ago Mr. Cranefield and Mr. Rasmussen came to La Crosse and helped us organize our first local society. A little later Mr. Rasmussen and I organized another local known as the North Ridge Society. In March we organized a third society, and in this month we organized three more local societies, so we now have six local societies in the county, with a total charter membership of 67. Through those local organizations, we hope to promote three things: First, the educational phase of the work; second, social;

and third, business. Some of you perhaps would reverse that order, but I think that that is the proper way in which the societies should work.

At the North Ridge Horticultural Society last spring, most of the members wanted to order some strawberry plants, raspberries, and so on, but the majority of the farmers did not know what variety they should choose. Local agents had been going through and loading the people up with half a dozen different varieties, some of them not good. The same is true with apples. The local agent will go through and will get an order for a certain number of Duchess trees, Northwestern greenings and others, and then they will have a few on their list that the man has not got, and to make their order a little bit bigger, they will encourage a man to take two or three trees of this variety, and two or three of another variety. That is all wrong. In the majority of cases it has not done the farmer any good, it has separated him from his money and discouraged him besides. We hope through the local society we will be able to do away with that kind of buying.

The North Ridge Horticultural Society last spring pooled its orders for strawberries, one man would want five hundred plants, another man five hundred, and so they pooled their orders, and the secretary sent them in, and when the order came, then the people of the community divided up the order. I think that is a splendid way for people in a community to buy their stuff, especially when they are inexperienced and do not know what they want.

Another thing that comes up, we have a local agent working in our county. At the present time he has been recommending apples that we know will not do well in La Crosse county, and it is time to teach the agent, if the nursery that he is working for will not teach him, that he should sell only the varieties that will do well, it will make his business better in the future if he does that, and it will make horticulture more substantial in the county.

Another thing is the price. Right now some of the local horticultural societies are finding out about what they should pay for certain lines of horticultural stuff, so that they will not be paying too much for plants, and so on, that they are buying. And then the methods of planting and cultivation, soil problems, fertilizer problems, and all those things come up at those meetings, and they are discussed by men who have had successful experience

along these lines. Day before yesterday I attended one of the local horticultural meetings at Bowman, and there we had a local strawberry grower give us in his own language his method of raising strawberries, and it was one of the most interesting meetings and discussions that I have heard in a long time. The man is perhaps the best strawberry grower in the county, and everybody in the community looks to him as an authority on strawberries, and with all those local societies we can help to develop the business so that the work will be both a pleasure and profitable to the various members.

Another thing that we hope to develop through the local societies is to develop local leaders. I find in my work that it is hard to find a local leader, that there is nobody that wants to serve as president, they think they are not able to do so. Through these local societies we will develop leaders, and it has always seemed to me almost a crime that young people will have to go to high school or some other place to learn to conduct meetings. I do not believe there is any better place for people to develop and learn to conduct meetings than right in their own community.

Perhaps you would be interested in knowing about the work of some of these locals during the past year. The North Ridge Society perhaps has been the most active. North Ridge is a school district about sixteen or seventeen miles from the city of La Crosse. They had no local organization of any kind out there, and the people were really hungry for something to go to. It is too far for them to go to the city, and they are of the progressive sort, and out there they are conducting their meetings mainly with local talent, but usually they have someone from outside the district come in and discuss some topic with them that they wish to have discussed there. They hold meetings regularly once each month. A part of the program has been put on by the local school children, part of it by the older people in the community. Last summer they held a large community picnic. It was well advertised and people from outside of their community were invited, and they had an attendance of about 250 people.

Through those local societies, we have developed a co-operative spirit that I do not think they could develop in the community without them. Those are some of the things that we have been taking up that I think are mighty helpful to the community. These societies furnish a medium through which the county agent can do

his work more effectively, and I believe it is going to be the means of increasing your membership quite a bit. If all the county agents would use the Horticultural Society through which to do their work, it would help the county agent, and it would help the State Horticultural Society in increasing its membership. In viewing your winter exhibit, I am glad to note quite a few blue ribbons on La Crosse county apples. It is really the first time I know of that La Crosse county has been able to win; it is due to some spray work, and the spray work that we carried on there last year, while it was not taken up with the Horticultural Society to begin with, it really started there, and the demand for spray work has grown so rapidly that next year we are not going to be able to take care of it all. Just the other day I received a letter from a man asking me to come over to take care of a spray ring. I said, "We have too many to take care of now." That is the way that thing is working over there, and it started through the little local horticultural society.

Now, in regard to the spray ring work. I started to get some help from Professor Moore two years ago, they were not able to get the assistance, but this horticultural work bobbed up, and that was one of the things that we wanted to take on, and during the past season a good many discouraging things turned up in connection with our spray work. In the vicinity of Holmen, where we have two spray rings, the frost killed practically all of the apples. The trees were well cared for, and we would have had a nice crop of apples, had it not been for the freeze. But the gratifying thing is that all the apples that stayed on the trees developed into nice clean fruit. Over on the St. Joseph Ridge, where we organized one ring, there is one orchard with about five hundred trees, where they picked five hundred and seventy-five bushels of nice clean fruit. We do not have to conduct any more demonstrations in that community to prove that spraying is a good thing.

I believe that the State Horticultural Society can increase its membership greatly by appealing to the county agents. Maybe it has already been done, if it has not been done, I believe the county agent is a good agency for the Horticultural Society to work with, and vice versa, I know that the State Horticultural Society is a good thing for the county agent to work with.

Thursday Afternoon Session

DISCUSSION OF THE DELICIOUS APPLE

MR. PLATTEN: I am from Green Bay, and I have one hundred and ten trees set out seven years ago. Six trees were set out eight years ago. The trees are hardy, they keep their leaves on late in the fall, which I believe is a sign of not being very hardy, but the trees are vigorous, and two years ago I got from one tree six apples, and this year a peck. The apples were small for the variety, but I presume that is due to Wisconsin conditions. The flavor is very good, the shape is not as pointed as is generally characteristic of the Delicious apple, they are pretty well rounded in shape, but about two inches in diameter is the largest size apple.

MR. BRIGHAM: On our farm we have Delicious trees, but the trees have not been as vigorous as some of the others. The trees have been planted, I should say, six or eight years, and have no fruit to speak of as yet.

A MEMBER: I have three Delicious trees seven years old. One of them is very well grown, and the other two have not done so well. The larger one had about a bushel of apples on this year. They are considerably smaller than the western grown Delicious, quite different in shape, but well colored, many of them deep red, and so far as quality is concerned, I call them very good, I would say a little superior in flavor to the western Delicious. This was in Manitowoc county.

MR. GOFF: At Sturgeon Bay I think every grower has a very few trees, not many of them. Most of those trees are too young to tell much about them, but we are finding that those that have reached ten years of age are beginning to bear. I have trees six years old, and those young trees had almost nothing, but the ten year old trees this year had possibly a bushel on them, and part of them reached full western size, and a very fine flavor, and if we can do that with any regularity at all, certainly it has a place. The question now is whether we have to wait ten years, and then how often we will get a crop. There is one grower that had quite a number of trees this year, and he shipped quite a good many barrels to Green Bay and put them in cold storage. I had one of those the other morning, and while those were sent out while slightly green, still when they came out of storage with a splendid flavor, just the slightest trace of the green taste, with which we are familiar, but I do not think there was enough to have interfered with the sale of them to any extent, and they would have been very useful as a commercial apple.

MR. BASSETT: There are several trees planted in the Baraboo trial orchard. The Delicious there are in fine condition, and they bore some apples when only seven years old. The trees are very

large and look healthy and all right. Some years ago I had rented an orchard that had three trees in it that were about twenty years old. From one of these trees I picked nearly four barrels of Delicious apples at one picking, and that tree has borne crops about every year for the last ten years.

MR. HOFFMAN: Seven years ago I planted some trees that made a wonderful growth, but I have not seen a blossom yet. They are good sized trees.

MR. KERN: I have about ten Delicious trees planted in 1912. They bloomed a little last spring, but the bloom was all frozen. The trees grow about as fast as the Wealthy, a measly looking tree, but perfectly hardy.

THE CHAIRMAN: Has anyone been growing the Golden Delicious?

A MEMBER: We have ten trees planted two years ago, and they seem to be very weak growing trees.

My neighbor has three thousand Delicious, and among them are a few Golden Delicious, that look very strong. The Delicious are apparently doing pretty well. About every third row through his orchard is the King David, and the King David has outgrown the Delicious by nearly a third. The King David have fruited, but the Delicious have not, yet they are six years old.

MR. BASSETT: I have Golden Delicious top worked that were sent me from Stark's Nursery. They made a tremendous growth, grafts that were put in a year ago last spring fruited some this year, had a few apples, but with the dry weather they dwarfed and did not hang on long enough to develop fully, although they were fairly large sized apples when they fell off.

THE CHAIRMAN: We are to discuss the Table Queen squash. I do not know how many have been trying to grow it. I will call on Mrs. Rasmussen.

MRS. RASMUSSEN: I could not tell you anything about their culture or care, but when it comes to cooking them, they are about as convenient in size as any squash that we have ever grown, and I think we have grown almost all kinds. One squash is about right size to be cut in half, and when baked for about an hour and a quarter, to my taste, they are the finest squash that have ever been put on the table, without any exception.

MR. ROE: We have some seed that we got last winter, and we grew probably two wagon loads of the squash, and they were rather hard to sell at first, because people did not know them, but after they had tried them, in fact, they came back and robbed us, so we hardly had any for our own use.

MR. LIVINGSTON: I grew some last year, but the people that I am with care nothing for squash, and my idea is there is no use growing anything you cannot use, so I simply cut it out. It did very well with me, and has borne a great many squash, and I think they are very nice.

MR. TOOLE: We grew some of them this year from three kinds of seeds, some Mr. Rasmussen sent out, some we had from the year before, and some we got from the Danish Import Company, from Minneapolis. They all, so far as we can see, came true to name, had no mixture, but we found them very handy, because of their being of individual size, but they lacked in sweetness. Those that we have grown have absolutely no sweetness to them at all, as we usually find and look for in the squash, fairly good flavor, pretty good quality, but not sweet.

MR. HAUSER: I think it is not quite as bad a mixture as we think for. I do not think that kind of a squash is so likely to mix with the Marblehead or the Hubbard squash, as it is with the Summer squash. I remember meeting with the vine seed growers in Fremont, Nebraska, and they told us there that the so-called Table Queen squash would not mix, or very rarely, with the Hubbard, Beaumont, and Marblehead squash, whereas for years the Summer squash would mix so you would have a fine collection of gourds. I think it is quite safe to plant those with your so-called Winter squash, but keep your crooknecks and Summer squash away from them.

THE GLADIOLUS

A. E. KUNDERD, *Gladiolus Specialist*

As I am not much of a talker to public audiences perhaps you will bear with me if I deliver my message to you by in part reading from notes. When I received an invitation from your Society through your secretary to deliver an address on the gladiolus at your annual meeting this year, I was pleased to accept the same. I have read a great deal for many years of the splendid work of your State Agricultural College, and of your Horticultural Society in the improvement of grains, fruits and flowers. Being a farmer born and still a farmer, all these things interest me greatly, but as you know my work is along a special line, originating and distributing new gladioli.

The gladiolus is fast becoming recognized as the most universally adaptable and useful of all summer flowers. Its possibilities

as a florist's flower, not only for out-of-doors growing but for greenhouse use, are almost unlimited, and just beginning to be realized. It is not an ornamental plant like a canna or coleus, and yet it adds great charm either to the border or among roses, shrubbery, etc., and is unsurpassed as a garden attraction and as a cut flower. The story of its cultivation, handling, storage, etc., is too long for me to discuss here and I take it that most of you are as well posted on that line as I am.

I want to refer you to a few books that will prove very useful to the professional grower as well as to the amateur. The best American book on the gladiolus of which I know is "The Gladiolus" by Matthew Crawford and Dr. Van Vleet. It used to be published by Vaughan's Seed Store and may perhaps still be secured through them. I believe it can also be had from The Florists' Exchange of New York. Allen's "Bulbs and Tuberose Rooted Plants" can perhaps be obtained through either of the above firms or your favorite seedsman. There is also considerable literature on the gladiolus published abroad, by the New York Experiment Station and elsewhere. I must not forget to mention the "Flower Grower" of Calcium, N. Y. The "Flower Grower" is issued monthly and I know of no magazine devoted to floriculture that is its equal. It is devoted to the interest of the dahlia, iris, peony and other flowers, as well as to the gladiolus, and in its columns much valuable information is published from month to month.

Now I come to the subject of The Gladiolus, its history, past and present, and its improvement and possibilities of still further improvement, or change. There are of what is generally known as species perhaps 200 or more known at the present. These are native mostly in Central and Southern Europe (what is left of it), Central and Southern Africa, Persia, The Caucasus, and Byzantium. The best of the species are mostly native of Southern Africa. I am fortunate in having a sister living in South Africa (not that I am glad that she is so far away), but her husband, Dr. Hall, brought me last year on a visit some fine new, almost unknown species. One of these you will want to know of, as I expect a great deal from it in my work of crossing. I have other collectors seeking for still other yet unknown species in the wilds of Africa, so you can imagine what may yet come from this wonderful flower, and see that the work is not yet all done.

The particular species I have just referred to has tall, slender and graceful foliage and stem. It has on the main stem upwards of forty blossoms and four of its branches have more than thirty blossoms each, giving from one spike about 175 individual flowers.

When you consider that almost endless combinations can be made from our ten numerals, you will realize what vast possibilities of combinations are yet contained in the many species of gladiolus. Do you wonder that I am fascinated with my work? Do you wonder that I am impatient when I hear that there are too many new kinds of gladioli? Of course, not all of them are good, but only by new introductions and comparison of new varieties can we advance in improvement. When I hear people say that only self-colors, or light and delicate tints are desirable, I wonder if they know what they are talking about. I live on the main line of the Lincoln Highway, 108 miles east of Chicago. There are six parallel railway tracks representing three different railway systems pass my home and thousands of people stop at my place during "Gladioli Time," and I can assure you that hundreds of the most prominent people will throw up their hands in Ahs! and Ohs! when they see thousands of varieties of almost every shade and color. Show your people thousands of rich and even gaudy colors and shades, reds, fancy colored, and beautifully blotched varieties and they will forget old notions about only self and soft colors, etc., and your sales will tell you how the people feel when they see something new, something good.

Now I must return more to the history of the development of the gladiolus. Of course, you all know that development of a flower is largely the result of crossing and selection by our new and scientific methods of plant breeding. There is much to be said on culture and growing, but never forget that the three greatest essentials to successful growing of gladioli, as of almost everything else, are good soil, good and frequent cultivation and plenty of water during the growing season. Well grown gladioli are very superior to those less carefully grown and a very choice variety may be very inferior if poorly or only moderately developed. Grow the best and have them in perfect condition, you cannot judge their merits otherwise, nor get the best results.

The principal older strains of gladioli are the Gandavensis, Lemoinii, Nanceianus, Childsii, and Groff's Hybrids. Gandavensis varieties are the result of a combination of species and previous

results of crossing different species and form the foundation of what later became the Lemoinii strain, produced by that wonderful breeder of flowers and plants, M. Lemoine of Nancy in France, by the infusion of the species "Purpurea Auratus" into the blood of the "Gandavensis" family of glads. Then Lemoine used his results to cross with species "Saundersii" to produce the larger flowered Nanceianus type. Then followed Max Leichtlin's cross of the "Saundersii" species on the "Gandavensis" family, giving us what was "Gladioli Leichtlinii," which became the famous "Childsii" strain. Next came Groff, the celebrated Canadian originator of gladioli, who used still other species among all the best varieties then in existence, and his work has attracted well deserved, world wide attention and recognition. The work of Groff is monumental.

I had watched this work develop since about 1880, or now over forty years, and having collected as many of all manner and kinds of gladioli as possible, and being a student of evolution and greatly interested in the gladioli, I began to cross on my own account about thirty-five years ago. Observing an inclination among varieties to show more or less variation towards convolution of the petals, I began the study of the species to learn if possible how the ruffled or wavy edged petals might be intensified or improved and a ruffled strain might be produced. By 1904 I was well on the way towards success and by 1907 I had sufficient of ruffled varieties to begin to sell a few, and in 1908 and 1909 I sent a few corms of ruffled varieties to Crawford and Gage, and to Luther Burbank and Dr. Van Fleet in 1910.

Now I am going to demonstrate to you the fact that The Ruffled Gladiolus is the result of scientific work in crossing certain species which I shall name, with varieties, and quote you some of the authorities who describe these species, and are not a result of sport variation or mutation, and still in much lesser degree due to some later conceived notion of some great "law," or rather something said about a law which may not bear the light of scientific investigation or application.

Bailey in his Cyclopedia of Horticulture describes species "Crispiflorus" as having "crisped or wavy petals." Species "Undulatus" as "wavy."

Childs says of species "Faciatus": "The petals have waved margins."

Allen in "Bulbs and Tuberous Rooted Plants," says of species "Cuspidatus": "The petals are undulated."

Now notice the names of these species:

"Crispiflorus" means crisped.

"Undulatus" means undulated or wavy.

"Cuspidatus"—cusped.

Faciatus, Imbricatus, and other species also show a deviation of edges of petals. You will be pleased to hear that soon I will be prepared to introduce an entirely new type with beautifully laciniated petals. I can show you photos of it now.

On the subject of growing gladioli in greenhouses, I am not well informed, as I am not a florist, but from what I have seen I venture to predict that there is a great future open to the florist in this field. Gladioli should not be planted too deeply as their roots are less liable to feed in the soil which is above the bulb level. In shallow soils this is important. Deep plowing or spading of soils is desirable but must be done with reference to the depth of the surface soil, as deep spading of shallow soils would bring to the surface too much of the subsoil. A covering of four inches of soil above the corms is generally considered about the best. Mellow loam or sandy soils are better adapted to somewhat deeper planting than is a clay or heavy soil. By successive plantings from early garden making time until late in June, then following with plantings in the greenhouse from about August 10 on until the following March, one may now have blooms of these magnificent flowers almost the year round.

You may be interested to know what I consider as the most beautiful colors and types of gladioli and I will try to tell you. The best variety is the one that pleases you the most, be it red, white, pink, yellow, or what not, but if you are a grower for commercial purposes then you must cater somewhat to the public tastes, but as I said before the public will soon learn to appreciate many and vari-colored varieties, if you will have them in fine condition. There are today almost no pure strains of gladioli grown, owing to the great amount of mixed crossing that has been done in recent years, and the field is open to the patient worker to produce yet many wondrous kinds. Let no man tell you that this is the best one or that, for "the best one" has not yet appeared, and you have as good a right to your preferences and to produce the best one as anyone. When two species, or varieties, cannot be

crossed directly, try the third one, and with the resultant seedling you may succeed in crossing indirectly and secure about the results you wish.

I want to refer briefly to descriptions, especially of colors. For the expert I believe in a color chart and think we ought to give more attention to this, but authorities seem to differ as to colors and tints, and as a rule I find that among the general public our old ideas of colors is suited best.

No doubt I have failed to speak of much that might interest you but will be glad to answer any questions you might wish to ask, as best I may.

DISCUSSION

MRS. ROLOFF: I should like to ask as to just how to plant the bulbs and how far apart.

MR. KUNDERD: I should plant as near the surface as possible, because I think the root systems feed more down than up, and they get the benefit of the soil and the rain, and do not penetrate very deeply. I think that four inches is the general practice by the older growers, but the depth of planting should be governed by the condition of your soil. If you have a heavy soil, plant shallow. If you have a shallow soil, plant deeper. The deeper the soil, the more soil you have, the safer you are.

QUESTION: At what stage would you cut the bloom for home decoration?

MR. KUNDERD: For home decoration, where the flowers are handy, I would prefer to leave them go at least two or three days. Cutting for the market, I generally advise to cut the first flower. It is better to cut them rather in a green state, but for the home I let them go nearly to the full flower before I bring them in the house. I would like to say in connection with that question, speaking of the keeping qualities of the varieties, that it depends a great deal on the soil and the season, and as to how you have grown the stock. I find the same variety will be a poor keeper under some conditions and a good keeper under other conditions, depending on weather conditions and manner of growing.

QUESTION: Is it better to leave the bloom to mature, or to dis-bud for the development of the bulb?

MR. KUNDERD: I would prefer cutting the stalk after a few blooms have come out, or after they have all bloomed, but I do not like to leave the seed pods to mature on the stem, I think that is generally an injury. They will have a better bulb if they are allowed to bloom first and develop pretty well up the stem, pretty nearly full bloom.

QUESTION: Did you find any serious pests?

MR. KUNDERD: We did last summer. We hardly knew what it was at first, we had a worm through Northern Indiana that looked a little like the corn-borer, but the county agent got after it and studied it, and made some reports about it, and said that it was the Southern Cotton Worm. It was found by the millions and took whole patches of corn, and did serious injury. That was the first time we had ever had it. Dr. Van Vleet visited my place in October, came there from Washington to see the methods of handling the soil and report to the government for the benefit of the gladiolus growers. He said it was not the cotton worm, they had heard a great deal of it in different parts of the country, and they expected next year it would not be so plentiful or serious. Perhaps the prevalence of it was due to the mild winter last year; if we had a severe winter this coming winter, the worm might disappear by next year. Outside of that, there are a few bugs and flies that occasionally bother us, but not to speak of. We have a little trouble in the ground occasionally with small maggots or worms that work in the root, but I think that is more due to the condition of the bulbs and plants.

MR. HAUSER: Is there any way of increasing the productiveness of the bulbs, that is, bulbs that are rather shy in that respect?

MR. KUNDERD: I should begin with the large bulb by cutting it in two. Cutting a bulb in two will encourage or stimulate bulb production and give you two bulbs instead of one, and I think both, as a rule, are better than where you leave the large bulb. I have always considered late planting, if we have a fairly long season, best for bulb production, because I think the plants grown from early planting have a disposition to stand still or become stunted, you might say, before they get to mature size and begin to set their bulbs during the dry hot weather of August or September. If you plant later, you are likely to have the plants in green and makes a great deal of difference as to the increase in bulbs. I growing condition and get good bulb growth in the fall. The soil makes a great deal of difference as to the increase in bulbs. I think, from what I get from my customers from all over the country, that the heavy soils are the shy bulb producers, more so than the sandy loam soils, even clean, sandy soils, if thoroughly well fertilized, produce the most bulbs.

MR. HOFFMAN: Do you consider the best bloom is obtained in heavy or light soil?

MR. KUNDERD: I think sandy soil will produce the best, cleanest stock, much nicer to handle, but in sandy soil you must bear in mind the old rule, good soil, good culture, plenty of water. Some varieties will do well in heavy soils and others better in lighter soils, and vice versa.

DEVELOPMENT OF APPLE CULTURE IN UNITED STATES

BY S. A. BEACH, *Chief in Horticulture and Forestry*

Iowa State College, Ames, Iowa

Your secretary in conversation with me a few weeks ago, when he was in Iowa, inquired if I would not attempt to tell this Society some of the things that he and I were talking about that evening at the hotel. So in response to his invitation I am here to tell you a little of the story of the introduction of the apple into this country as I know it.

The apple, as you know, had its origin principally in Asia Minor, in that region from which the Armenians come, and from that part of the Caucasus region between the Black Sea and the Caspian Sea. It is supposed that that was the original home of the apple. It has been in cultivation from pre-historic times. As the races migrated from that center of population into the Mediterranean countries and on into Western Europe, they carried with them other fruits and domestic animals, and took along with them the apple.

The apple was cultivated in Europe in pre-historic times, because we find evidences of it in some of the pre-historic remains that are found in Switzerland and other portions of Europe. But that was long, long ago. At the time Columbus discovered America the apple was generally grown throughout Western Europe and in the mountain regions anyway of the Mediterranean countries, in Spain, in Northern Italy, down into the Balkan regions, and into the far eastern portions of the continent in Russia and northward as far as the northern limits of apple culture. But the introduction of apples into this country came naturally from the persons who first migrated here for settlement, that is, through the Spaniards, by whom certain types of apples were introduced into Florida and other portions of this country. These attracted the notice of Indians and were soon planted among the permanent settlements of the Indians, the same as were peaches. Farther northward among the settlements of the Eng-

lish and of the Swedes and of the Dutch and the Huguenots and of the other French and the German and some of the other Scandinavians, we find that they brought to this country apples of the kinds that were being grown in the old country, and so there were introduced into different settlements along the Atlantic coast different types of apples.

Wisconsin does not grow the same type of apples that Georgia grows today; New Jersey does not grow the same type of apples that Minnesota is growing, and New England does not grow the same kind of apples that are grown in California to any considerable extent. And so as those settlers came from different European countries they brought with them different types of apples from their different home lands. Those that were introduced into the southern states gave rise to the southern types of apples as we know them today, apples that require a long season to ripen and which, as we grow them in this part of the country, are absolutely worthless. I do not think it is worth any man's time in Wisconsin to give room to the kind of apple trees represented by those southern varieties, at least most of them, such varieties as the Nick-a-jack and big Red Romanite. I imagine you might still find in Wisconsin, some trees of the Little Red Romanite, an apple that does not get ripe until spring. The boys used to throw them at each other, because they were hard as rocks in the spring, and the good housewife used to use them in the spring after all the other apples were gone, by baking or cooking them. They did not come into this part of the country except to a limited extent.

There was one apple originated in Virginia that became noted in the middle west, the Ralls Genet, or Janet, or Never-Fail. It has been grown under a great many different names through the middle west, and I am sure it reached into southern Wisconsin. It is a very good apple for the home orchard. It is a valuable apple, keeps well into winter and represents a type of a French group of apples that were early introduced into America.

Then we have also apples coming to us from the south, of the Willow Twig, Rome Beauty and Ben Davis types. Although the Ben Davis did not originate in Virginia or in Kentucky, nevertheless it is known that that group of apples got their start in the more southern regions of the country.

Then, as we go further north up the Atlantic coast we come to the region of New Jersey. The first book on fruit culture written

and published in America was one by Cox of New Jersey, published in 1817. It is interesting to go back over the list of varieties which he enumerates that contains some of our standard varieties of apples today. The first part of the book is given over largely to directions for making cider and apple jack and vinegar, and then, incidentally, perhaps, in a way, comes the description of the varieties of apples and other fruits. Among those New Jersey varieties of 100 years ago we find the Winesap. That is one of the most valuable lines of apple blood, if we may speak of apples having a line of descent in that way. It represents one of the most valuable lines of apple blood for the southern apple growing districts. For instance, in the Ozark regions and in the apple growing regions farther south where one of the serious orchard troubles is root rot, we find that the Winesap and Mammoth Black Twig and other apples of that group are more resistant to the root rot than are the ordinary varieties which they grow there. The Winesap group is a big advantage to them, not only because of the fruit itself, but because it can be used as a stock on which to grow other fruits, just as we of the north need hardy stock so our apples can be insured against having the roots winterkilled, so in the South they need stock that will resist the root rot.

Another one of the varieties which is named in this New Jersey list of 100 years ago is the Yellow Bellflower. The Yellow Bellflower group includes a number of other kinds such as the Ortley, Mason Orange and some others that we might name; some of them have red color, like the Dickinson. The Yellow Bellflower was known among the Early German settlers as the Sheepnose. The Yellow Bellflower has been grown through New Jersey, Pennsylvania, the Virginias and on westward into the Ohio valley and is now one of the commercial varieties grown at Watsonville, California.

Now, why is it grown at Watsonville, California? Because Watsonville does not have enough sunlight to make a red apple. It is a valley next to the Pacific coast; most of the time during the growing season fog rises early in the morning, and spreads over the valley. It would be disastrous to them to have a clear day. If you will notice the varieties that come from Watsonville, California, they are the Ortley, the Yellow Bellflower, Newtown Pippin, all of them green or yellow apples. The Ortley, by-the-way, is getting to be recognized as one of the good apples to grow in the

Hood River country and in other parts of Oregon. It is of good form, color and quality.

Another one of the varieties which came to light in New Jersey was the Maiden Blush. It has given rise to quite a group of varieties of similar type as the Greenville, which was first introduced as Downing Winter Maiden's Blush.

In the neighboring early settlements of Pennsylvania, we find some of the apples which originated evidently from Germany. The oldest cultivated variety of apples that we know of is the German Borsdorf, an apple below medium size, perhaps; I do not think now of any other common varieties that have exactly that texture and quality. It has mild flavor and good quality. It has been in cultivation for over 400 years. Other varieties which were introduced into Pennsylvania, or early originated there, were those of the type of York Imperial, Rambo, Fallawater, Smith Cider and others that might be named.

Going across from New Jersey to Long Island, we come into one of the Huguenot settlements, right near where Theodore Roosevelt lived, not far from Long Island City, at Flushing. There the Prince family had nurseries at the time of the Revolutionary war. There they brought over from France and the low countries like Belgium, and Holland, some of the choicest old-time fruits, including the Gage plums and different kinds of pears. You know at Louvain, in Belgium, which was devastated by the Germans in the early part of their raid in the recent world war, there was being carried on a hundred years ago one of the greatest experiments in breeding pears that was ever carried on anywhere in the world. It gave the world many of our fine pear varieties. Some of these varieties were included in these Prince nurseries at Flushing, Long Island. Among the apples there was found the Green Newtown Pippin which, with its bud sport, the Yellow Newtown Pippin, has been propagated in certain limited localities and has been in demand as an apple of very high quality and excellent keeping qualities. In the Virginias it is known as the Albemarle Pippin; in Hood River and that region of the Pacific northwest where it is grown it is known by its correct name as Newtown Pippin, meaning by that always, I think, the Yellow Newtown Pippin, grown in preference to the green type because of the superior yellow color. As you go through those old Long Island orchards and along the roadsides you find chance seedlings in many parts of Southeastern New York and particularly in the

Long Island and Hudson River districts, you will see many unnamed apples of the same general type as the Green Newtown Pippin. There we have also the Long Island Russet, the Newtown Spitzenberg and the old Spanish Reinette, from which we get our apples of the Fall Pippin type.

Going across Long Island Sound into southern New England, you find that there the Rhode Island Greening originated 150 years ago. Further up the coast near Boston the Roxbury Russet and the Baldwin originated. Farther north in Maine, you will find the Blue Pearmain, and other kinds with a mingling of the Blue Pearmain blood. Some of them are good apples, ranking even very good quality, like the Nodhead of Maine, which is properly known as Jewett Fine Red, and like the Westfield Seek-no-further, which originated in the hills of Westfield, Massachusetts.

Further north in Vermont and northern New York in the valley of Lake Champlain and down into the valley of the St. Lawrence, you run into a type of apples introduced by the early French settlers during the time of the early Jesuit Fathers, from which we get the group known as the Fameuse or Snow type. Among them are the McIntosh, Princess Louise, Canada Baldwin, Shiawasse Beauty and other such apples. Some of that type were carried into the western settlements by the French voyageurs, and near Dubuque, Iowa, there is, or was recently, still standing one of the old apple trees of that type which was known among Iowa fruit growers as the Old Dubuque, simply a seedling of the Fameuse type. This Fameuse strain has been used by Mr. Patten of Charles City, Iowa, one of our veteran fruit breeders, who passed away about two weeks ago at the age of 89, a man who started fruit growing, I think, here in Wisconsin before he went west to Charles City, Iowa. I believe that he obtained from Wisconsin the seed of the Duchess of Oldenburg, from which was originated the first apple that he introduced, known as Patten Greening. It is valued for the northern districts. Mr. Patten also used some of the Fameuse blood in breeding from which he got apples like Eastman, Brilliant and others that might be named.

The Blue Pearmain has given apples of a type that are found in northern Vermont, northern New York and in some portions of Wisconsin. The Blue Pearmain group have hardiness usually, but are not excellent keepers. They will keep into the fall or early winter; some have red color, more or less distinct spotting, usu-

ally of a mild flavor, sometimes sweet in some of the varieties, and not as fine quality as is required to make a first class apple for the general market. You do not find Blue Pearmain or any of those groups, so far as I know, competing in the general market with apples like the Grimes or Jonathan, or even the Baldwin and Ben Davis.

It would be easy to run over in a similar way some of the contributions that have come to us from other different sources, giving us the groups of apples and the varieties of apples that we have today in Wisconsin, Iowa and Minnesota. As we run over the list we find we have the Wealthy, which originated as a hybrid, doubtless, between the Ramabo and the Red Siberian Crab. Others that have been brought to light or prominence are Allen Choice, Malinda and a group of others which had their origin in Wisconsin. I do not know to what extent the people of Iowa are indebted to the Wisconsin fruit growers for the list of apples which we have in Iowa.

There were some years ago, I think in the early eighties, perhaps even earlier than that, some seedling apples grown in Waupaca county, Wisconsin, sent to Iowa State College for testing, and one of these, as I remember, that is mentioned first and has been most widely disseminated and is most highly esteemed among that group, is Northwestern Greening. We also have another, the Evaline, which is a very good, hardy tree and productive and a fairly good apple.

Then we have with us a type of seedlings that has come from Alexander, a Russian variety, such as the Wolf River. Then we have the Scarlet Pippin, Pewaukee, and Windsor, McMahan and other apples of that kind, some of them being quite widely grown today in Iowa.

Perhaps it would be of interest in this connection to call attention to the fact that apple growing started in this country shortly after the permanent settlements were made. Take it in Plymouth colony, Massachusetts, where the settlement was established in 1620, inside of ten years they had apples growing there, doubtless from seed that had been brought over by the settlers, and from that time on apple growing became a feature of the settlement of the country. As settlers left their old homes and went into the woods to hew out of the native forest a little place where they could build their log cabin and sow some wheat and plant some Indian

corn, usually the young wife would take along with her the seeds of some of the choicer apples that she knew in her old home. She would plant those seeds in the soil where they had burnt a log heap, may be, which had left the ground free from weeds, and mellow. Then the seedlings as they would come up would be transplanted into the nursery row, and soon they would have an orchard to supply the family with fruit.

And so all over the eastern part of this country, repeatedly, over and over again, as those homes were carved out of the forests, there were planted those seedling apples. So we have had during the past three hundred years apple breeding going on, on a grand scale, and out of it have come these varieties which I have named to you.

I have in mind just one place in western New York, where the people came in from Connecticut, and the women folks brought with them the apple seeds in the way I have indicated. Out of the trees that were planted in that place came the Northern Spy, and the Norton Melon and the Early Joe, all out of one stock, I suppose, of apple seeds. Then, as apple growing began to spread westward, in a country where we have extremes of climatic conditions, such as we find in parts of Wisconsin and further west, it was found that those varieties which had been brought in here from the east were not all of them hardy. So there arose the question of selecting varieties from the standpoint of hardiness.

In 1816 there was a notable importation of apples made from the Swedish Horticultural Society to London by the London Horticultural Society, and in 1832 the Massachusetts Horticultural Society brought to this country those same seedlings which had come to England by way of Sweden from Russia. As they were planted out through this western country, through central Ohio, northern Indiana, northern Illinois and Wisconsin, when the test winters came which injured or killed the old varieties that were tender these Russian apples stood the test. We then found out that these apples were of superior hardiness. They are the Duchess of Oldenburg, the Alexander, the Red Astrachan and the Tetofsky. It was because of the record that these varieties made that our attention was first turned to seeking in Russia for other varieties of merit and of superior hardiness. Now we have some of them that are on our lists today that have been imported directly from Russia, such as the Yellow Transparent, the Longfield, the

Lowland Raspberry, Lubsk Queen and some others of superior hardiness. One is said to fruit as far north as Winnipeg, that is the Hibernal. The Hibernal is not a very good apple to eat. I have seen little boys go to a Hibernal apple tree, take a bite and throw the apple down. Nevertheless, it is a good cooking apple, an apple of good size, and we are using it in breeding hardy apples.

I shall hope tomorrow to have the pleasure of telling you something about the fruit breeding work we are doing for the State of Iowa through its regular Experiment Station organization. For that purpose we are endeavoring to cull out from all this material which I have been listing to you that portion which is evidently best adapted for developing in this region apples which shall be adapted to this region, and which shall be of that degree of hardiness and productiveness and that style and quality and season of fruiting that they can be grown profitably throughout this upper Mississippi valley and can meet the competition of apples like the Ben Davis and the Baldwin in the general markets of America.

A COLLEGE EDUCATION FOR THE FARM ORCHARD

BY F. R. GIFFORD

In the March issue of Wisconsin Horticulture appeared the following editorial under the title, "Here We Have Action." Mr. F. R. Gifford, who is "extension" worker in the Department of Horticulture, Agricultural College, is hot on the trail of the neglected farm orchard. For example: During the two weeks, February 14th to 26th, twelve meetings were held in Dodge county where, as the announcement read, "every phase of fruit growing upon the farm will be discussed and you will be afforded an opportunity to ask questions." Good work! Good hunting! We hope Brother Gifford will tell us about these meetings."

I had intended answering this editorial as soon as reports were in from the orchards and spray rings and results were known. Mr. Cranefield's invitation to come to the Horticultural Society Annual Convention with an outline of Horticulture Extension work or as he words it "Come to the meetings and tell the Horticultural Society just what you are doing, how you are doing it and what success you are having," gives me the desired opportunity to answer it.

Wisconsin is a state of farm orchards. Most of these orchards are in a neglected condition. Thousands of farm orchard owners are desirous of improving existing conditions. Most of them have tried and failed and are now awaiting help. Hundreds of applications for help are received by county agents who in turn write to the Horticulture Department for the service of the specialist. Although working at top speed we find it impossible to do but a small part of the work. Fourteen counties are now on the waiting list. We are, however, doing what we can to help the orchardist throughout Wisconsin to better the orchard condition, produce clean fruit and market the surplus.

Work is necessarily slow as the call for the work is so great and the workers few. Only enough work is lined up to insure carrying the work through the year successfully. Thorough spraying is especially essential. Simply demonstrating the orchard operations is not enough as we feel that the local leaders as well as the orchardist should have practical experience in the operations necessary for the production of clean fruit in order that the work may be permanent.

In its endeavor to serve as many communities as possible and that all parties concerned may be prepared for the work a definite program is closely followed. This program calls for work in a county, cooperating with the county agent, for two years. Intensive work is carried on in four counties each year. Two counties with two year work and two with first year work. During 1920-1921 second year work was carried on in Grant and Dodge counties and first year work in La Crosse and Jefferson, except for lectures and possibly pruning demonstrations to keep active interest at a high pitch no work will be done in Grant and Dodge counties in the future. Kenosha and Fond du Lac counties are now in line for orchard work. Thus we have for 1921 and 1922 second year work in Jefferson and La Crosse and first year work in Kenosha and Fond du Lac. In order that spraying may be done on time and under the direction of the specialist, apple blossom periods must be taken into consideration. For example, the growth period in Kenosha county must be a day or two later than La Crosse county and so on. In the first year counties, pruning demonstrations will be held in five or six communities. All men attending the demonstration are asked to bring saws. After a fifteen minute discussion of pruning the neglected orchard, since

in most cases we deal with such orchards, we start operations. Usually six to fifteen men in groups of three do the pruning. The axe is often used on badly diseased trees and undesirable varieties. The men are expected to go from the demonstration to their own orchards and put into practice what they learn. Figures will be given a little later to show how this works out.

Pruning over for the day, results are discussed and if future work is desired organize for the summer spraying program.

Spray rings are organized if possible and either a hand sprayer is loaned the men or they purchase a power outfit. From five to fifteen orchards can be sprayed, depending on the size and type of the sprayer. In case a power sprayer is ordered by the community one man is chosen, preferably a member of the ring, to operate the machine.

Material is bought wholesale from some reliable chemical company.

In first year counties three to four spray rings are about all that can be handled as thorough work is absolutely essential if the second year is to see county-wide orchard activities. After showing the results of pruning and spraying by holding county-wide demonstrations in the demonstration orchards and putting on exhibits at county fairs it has been found impossible to take care of the many communities asking for orchard improvement work. Two county agents have remarked that their entire time could be spent in orchard work after the first year's drive. Second year work means six to eight community spray rings distributed over the county. Little attention needs to be given the old spray rings. Four times during the spring and summer each spray ring is visited and the spray machine operator started on his round of orchards with an understanding of his work. As it was a physical impossibility to visit every one of the 181 orchards under supervision each time spraying was necessary the telephone was sometimes used and often men were asked to come to some central point for instruction. The telephone was used only when work had been carried on for a year.

To reach the mass of people demonstration exhibits were put on at county fairs in the counties where intensive work was carried on. In 1920 the aim was to appeal to the orchardist convincing him that he could ill afford not to spray his orchard. This year the appeal was to the retailer and consumer as well as the pro-

ducers. The appeal to the grower was through increased production and the improved character of the fruit; to the merchant through the better selling possibilities of sprayed and graded over ungraded and unsprayed fruit, and to the consumer, the housewife, in the fact that the same quantity of poor fruit entailed more labor and gave less results than good fruit.

A new type of work carried on this year was in assisting the orchardist who sprayed to dispose of his fruit. It is an interesting fact that the orchardist who has never had enough fruit to supply his own needs becomes greatly concerned about the possible inability of being able to dispose of his surplus when he begins to spray. Strange as it may seem this is the reason given by many farmers for not taking proper care of their orchards. This condition arose in connection with the spraying work carried on in the three spray rings in Jefferson county.

Some of the growers had tried to market their fruit without success and it began to look as though much of the good effects of producing a crop of good fruit might be lost. A meeting of the interested growers was called and a plan of cooperative grading and marketing outlined. The plan was based upon the principle that all parties should profit by such an organization. The grower was to receive more for his fruit, the retailer was to get larger profits, and the consumer was to get a grade of fruit at a price which would be to his profit. Such a program might at first appear to be impossible but it was exactly what happened when these growers carried out the plan.

The first move was up to the grower. He was made to see that although his fruit had been sprayed, it was still necessary to grade it in order to get the best results and create a demand for prime sprayed fruit.

After considerable argument four grocers were persuaded that the growers were offering them an opportunity to make more money on apples than they had been making handling the general run of cull stuff brought in by the farmer who did not spray and grade. The agreement reached with the retailer was that he was to pay the grower a definite price and that he was to sell the fruit at a price dictated by the grower. In order to get the plan started it was necessary for the grower to agree to take back all fruit not sold within a definite period.

The final problem was to interest the consumer. This was accomplished by an attractive window display. The show window informed the buyer that day's special was "Wisconsin Sprayed Apples," "Hand-picked, graded, no worms." Several bushels of the fruit were displayed in the window; placards telling of their special value and uses. The window display immediately attracted attention and resulted in many customers. The merchant when called to the phone to take an order for other groceries politely informed the customer that he had a splendid bargain in "Fine, wormless, Wisconsin apples." The grocer who made the first trial said at the close of the first day's business that his sales of apples that day had exceeded his entire sales of the week previous. While he had made as much commission per pound as on the inferior fruit, his total net profits were much greater. The seemingly impossible had been accomplished. The producer had found a profitable market, almost at his door, the grocer was reaping larger profits and the consumer, the best satisfied person of the three, had learned that good Wisconsin apples were to be had at prices which made it poor economy to use an inferior grade of fruit or to invest in imported apples at much higher prices.

The problem of the grower was no longer to find a market. It had become one of keeping his market supplied with the grade of fruit which made possible his market. Cooperation was necessary to accomplish this. The farmer picked and graded his fruit as it became ripe. The farmers chose one of their number to be sales manager, much the same as earlier in the season one of their number had been chosen to operate the spray machine. The fruit consigned to the manager was turned back to the grower if it did not meet the desired standard. As the price was already established all that was necessary for the sales manager was to consign the fruit. He did not have to look much for markets. They had already been established.

The results of this venture are that the growers have been able to dispose of all the fruit from their 1,200 trees at remunerative prices, the grocers have been convinced that it is not necessary to handle the cull fruit usually offered by the farmer, and the consumer has learned that he can have good fruit if he demands it at a price which is not prohibitive and that it is cheaper in the end to buy good fruit at a seemingly high price than cull fruit at any price.

Another new phase of work carried on this year was the organization and training of a boys' orchard team. This team was

organized along lines of the Boys' Club and in cooperation with the Department of Boys' and Girls' Club work.

The Mount Hope Boys' Fruit Club consisted of five boys under the local leadership of E. M. Cox, principal of the local high school. They rented five farm orchards on a share basis, giving 50 per cent of the fruit produced as the rental for the orchards. The usual spraying program was carried out. Although the entire crop has not been harvested the boys have already marketed over $300 worth of apples as their share.

Shortly before the state fair the boys became interested in putting on an exhibit and demonstration at the fair. Although handicapped by the short time in which to prepare they were rewarded in their efforts by winning first with their exhibit and taking fourth among all the teams in demonstration work. It would seem that this line of work might be largely increased in the future with great profit to the fruit industry of the state.

The boys also gave a demonstration before 250 fruit growers at a county-wide fruit picnic at Lancaster, Grant county, last August.

I have given you an outline of the work without mentioning many figures. A summary of the work in figures will give you the year's operation in a nut shell.

Twenty-seven pruning demonstrations were given in six counties.

Most of the work was carried on in counties where extension work was in progress. As a result of the pruning work in these four counties, Grant, Dodge, La Crosse and Jefferson, 4,100 trees were pruned.

Eleven spray rings organized with power sprayers.

Eleven spray rings organized with hand sprayers.

Many single orchards were under supervision where both power and hand sprayers were used.

The work by counties:

First year work, La Crosse, 22 orchards under supervision.

First year work, Jefferson, 36 orchards under supervision.

Second year work, Dodge, 42 orchards under supervision.

Second year work, Grant, 80 orchards under supervision.

To show growth:

In 1920 Dodge county had three orchards under supervision; Grant county had twenty-seven orchards under supervision.

Many pruning demonstrations were held in other parts of Wisconsin.

A total of 11,000 trees under cooperative spraying in five counties.

One orchard under supervision in Fond du Lac county.

Two boys' orchard clubs organized.

Twenty orchards under fertilizer trials.

County-wide demonstrations:

Four county fair exhibits.

One cooperative marketing association formed.

A program of work was also given communities when supervision was impossible.

Newspaper articles were sent to every part of Wisconsin where apples are grown giving time to spray, materials and good type of sprayer.

As a result of our work during the past year at least thirty communities are making plans for orchard work with power sprayers.

DISCUSSION

QUESTION: Have you kept a record of the comparative cost of hand and power spraying?

MR. GIFFORD: Using the power outfit and spray rig, fifteen members, it costs 30 cents per tree. That is, not counting in the cost of the power outfit, but counting the labor and material, four sprays. With the hand outfit it costs slightly more, not very much. Spraying with the hand outfit costs a little less for the material and a great deal more for labor, and with the power outfit we could spray six or eight trees, where, with one of our large hand outfits, we would spray one tree.

QUESTION: In other words, 7½ cents per tree?

MR. GIFFORD: Yes, 7½ cents. Where we are taking a thousand trees in a block, we figure about 4 cents per tree per spray, but where we have fifteen orchards spread over five miles of territory, and having to spray fifty trees here, a hundred trees there, it costs a little more.

QUESTION: Do you figure in all the time on the road?

MR. GIFFORD: All the time, yes. This man who runs the outfit charges $11.00 a day. He took the sprayer and did the spraying in two days, and then after he had finished the spray ring's work, he did several orchards around the neighborhood. In those he sprayed outside the price was 30 cents a tree, while in the

spray ring, where they sprayed simply the ten or fifteen orchards, the price was about 15 cents per tree.

QUESTION: In these spray rings, how long would it take to pay for the price of a good spraying outfit?

MR. GIFFORD: That is a good question. Every farmer paid for the total investment, the labor and the material, the first year. It should cost the farmers $30.00 apiece for the outfit. In every case the farmer paid for his share the first year, excepting two spray rings where all the fruit was killed by the frost. Wherever they had fruit, it was paid for the first year. I have only been through one year's orchard work in Wisconsin. The thing to do is to convince the orchardist that spraying and taking care of the orchard pays. The first thing is to produce clean fruit. After they have produced clean fruit, they are willing to do anything.

QUESTION: Where you have a lot of orchards like that, is there danger of killing the bees by spraying, while there are still blossoms on the trees?

MR. GIFFORD: I don't know about killing the bees, I have had a good many discussions about that this year. It seems that this year the bees are in very poor condition, dying off anyway, the bee men like to blame it to somebody, and they blame it to the fellow that is spraying. Suppose we have a hundred colonies, and if you figure twenty thousand bees per colony, when they come out of storage in the winter, and you figure the life of an old bee to be five weeks, especially in the spring, you will readily see that that makes two million bees that have got to die in five weeks' time, you are bound to see a few dead bees around the hives or in the orchard. I think a little too much stress has been laid on the poisoning of bees.

QUESTION: You do not know how many insects are killed by the poison either.

MR. GIFFORD: No, we have not figured that out.

QUESTION: Does it injure a tree to spray it while it is in blossom?

MR. GIFFORD: We have not experienced any difficulty in that. If an orchard is on the northern slope, we can leave that orchard to the last spray. Usually the farm orchard is around the house, and they are all in about the same condition. Varieties differ. We found if we waited until the blossom was about ready to break open, the Northwestern Greening and the later varieties would be breaking in the cluster, and all could be sprayed about the same time. However, we had no difficulty at all in controlling the codling moth or curculio whatever, and we did not spray the trees in blossom, we did not mean to, we may have sprayed occasionally a tree, not always possible to tell.

MR. SMITH: Does not the wind often have a real ill effect on spraying?

MR. GIFFORD: We spray just the same. Sometimes we have only two or three or four days to spray, starting out when the calyx is open, we have only just four days when we can put it on. Especially if a couple of days are rainy, we must spray when fine and we do. We waste more material on a windy day. In our power outfit we use the spray gun, except on very windy days, and then we use the spray rod. We have a twelve-foot rod.

QUESTION: Have you a bulletin describing your methods of instruction?

MR. GIFFORD: No, we have a bulletin telling when to spray, what to spray with and how to spray, etc., but no bulletin on the work I have just described.

QUESTION: What material do you use?

MR. GIFFORD: Liquid lime-sulphur and powdered arsenate of lead. One gallon of liquid lime-sulphur, one pound powdered arsenate of lead to forty gallons of water.

QUESTION: Did you ever try dust spray?

MR. GIFFORD: We did not succeed in controlling scab, that is all I can say.

QUESTION: Is two and a half pounds to fifty gallons of water too strong, without any sulphur?

MR. GIFFORD: Well, it would not hurt the leaves of the trees, but the sulphur is wasted.

MR. KERN: Does the spray ring buy the material?

MR. GIFFORD: No, the farmer buys everything.

MR. KERN: Would it not be an advantage to buy in large quantities at cost?

MR. GIFFORD: We get it just as reasonable as the department would get it. Liquid lime sulphur costs 19 cents a gallon, powdered arsenate of lead 22 cents a pound.

DR. FRACKER: I am sure Mr. Gifford is underestimating the poisoning of bees. For the first time this year we have actually analyzed the bees which have been killed by spraying in the neighborhood, and we have found arsenate in the dead bees. The evidences that this is a commercial matter for beekeepers are quite strong, because of the fact that beekeeping has been driven out in a number of important commercial orcharding sections. The danger is not only in spraying the blossom, although that is really dangerous, but at times there appear to be cases in which the bees

take up the poison from the leaves, especially when there is a shortage of water. The idea that this is not a serious matter ought not to cause the orchardists to spray when the trees are in blossom, if they can avoid it, because the matter has been proven to be a very serious one to beekeepers, particularly in Sauk county the past year, and also in the southern tier of counties in a number of cases the losses may be a matter of real serious consequence. I should like to make an especial appeal to all those who can possibly avoid it to spray when there are no trees in the orchard of any variety in full blossom, although sometimes it is difficult to avoid spraying when at least some varieties are in blossom.

THE CHAIRMAN: We are glad Dr. Fracker has called our attention to the matter. I am sure we will all try to protect the beekeeper in this matter.

FACTS AND FALLACIES ABOUT TREE SURGERY

S. L. BROWN

Tree surgery is mostly just common sense properly applied. It covers about four main ideas, pruning, cabling, repairing surface damage, and cleaning out and treating decayed parts.

Pruning is done to remove dead branches, to remove branches that obstruct the view, to promote a symmetrical growth, and in shade trees to maintain a healthy foliage and twig growth.

In removing dead branches there is not much danger of cutting too close to the trunk of the tree, unless the branch has been dead for some time and has started a shoulder growth; in that case, cut as close as you can on top bringing the cut out at the bottom about one-tenth the diameter of the branch, leaving a slight shoulder at the bottom. Serious leaks that sometimes become permanent are caused by cutting too close at the bottom. Leaving too much of a shoulder is just as bad; in that case the bark will die at the bottom of the cut leaving a projection of dead wood over which the bark cannot heal. Paint the cut with asphaltum or some other tar paint; do not use lead paint. Experiments have shown that bark will grow over tar paint or no paint quicker than over lead paint.

In removing a large branch better make two cuts, the first a foot or more from the trunk, under cutting to avoid a split and then making one clean cut close to the trunk.

Trees that carry a thick top and scant foliage are improved by pruning out a large part of the smaller branches.

CABLING

A great deal of damage is caused in trees by weak crotches splitting open in wind storms, snow and ice, or a heavy load of fruit. This may be avoided by cabling, using screw hooks one-fourth to three-fourths inch in diameter, according to size of tree, use a bit of one size smaller than the hook, be sure to turn the hook in so as to bury the thread, it will not be as liable to break. If the tree is large two cables are better than one; place the first four or five feet above the crotch and the other about the same distance above the first. In case the crotch is split open any distance it may be necessary to pull it together with block and tackle before putting in the wire. Use No. 12, soft galvanized wire, four to sixteen strands according to size of tree and hooks used; with a short bar or claw hammer twist in to a solid cable. If crotch is not opened up much twisting the wires into a cable will draw it together sufficiently.

If crotch is badly slivered and will not draw together snugly it will be a good idea to cut out enough of the crotch to put in a false crotch of cement to make a water shed.

You can tell a weak crotch by its appearance, and it is a good plan to put in the cable before it opens up. It will not take a very heavy cable to hold it before it splits and you may lose the whole tree in a storm after it has once started to split. Placing a bolt through the crotch is a good plan if a bad split. The bolt without the cables is not much of a success as the movement of tree in the wind will keep crotch from healing, but with the cables it makes a rigid job and will heal in time.

REPAIRING SURFACE DAMAGE

Injury to the bark of a tree if discovered in time can in many cases be successfully treated, if not too badly torn, by pressing the bark firmly back in place and bandaging, using tacks or short, large headed nails to hold it in place. Cut away the torn bark that will not fit back into place and paint the wood that is not covered by bark. Be sure and remove bandage before it shuts off too much circulation and interferes with the growth.

In old surface wounds where the bark is dead and decay has started, remove all dead bark, cut out the decayed wood and paint with asphaltum paint. If bark is not destroyed over half way around, the tree if healthy will grow new bark if wound is kept clean.

Sun scald causes considerable damage to some varieties of young trees especially Norway maple, linden, and occasionally the elm.

This should be treated by cutting away the dead bark as soon as discovered and giving the exposed parts a coat of paint.

If neglected for any length of time borers will get into the tree and do more or less damage. Sun scald may be avoided by wrapping the trees with strips of burlap or other similar material the first few winters after trees are planted, remove the wrapping after the snow disappears.

If it is necessary to fasten the clothes line or a hammock to a tree use screw hooks, anything that presses against the bark chokes the flow of sap.

CLEANING OUT AND TREATING DECAYED PARTS

In treating old wounds that extend into the heart wood of a tree, it is advisable to remove all decayed and fungous infected wood that can practically be reached and removed by chisel and scraper, and then apply a good coating of creosote, carbolineum, or other wood preserver with brush or spray.

If wound or cavity is such that it will not drain itself it should be thoroughly cleaned out, treated with wood preserver and filled with concrete at the bottom so that it will drain, and be sure that the concrete is firmly bedded in wood so there will be no chance for water to run down between the wood and the concrete. Fungous growth thrives on moisture so the upper part of the wound would better be left open for future treatment and disinfection.

If all the decayed and fungous infected wood can be removed, it would be alright to close the opening completely with concrete, but if any infected part is covered up with concrete the decay will continue with no chance for further treatment.

In many cases of heart infected heart wood it is impractical, and impossible to remove all infected wood, as in the case of a tree that has a hollow trunk extending up among the branches and

infection undoubtedly extending into the branches. A tree in this condition if not too badly weakened by decay at the base, may be preserved for a time, by cleaning out, treating, and filling the lower part of cavity.

DISCUSSION

QUESTION: What paint do you use?

MR. BROWN: Asphaltum, tar paint, or carbolatum. If it is a saw wound, we probably get better results with carbolatum. It seems to dry out, no leakage from it. With ordinary cuts, I get better results from asphaltum paint.

QUESTION: Do you advocate bolting a tree that is split at the crotch?

MR. BROWN: If it is a tree with a heavy top, it is sometimes advisable.

QUESTION: Do you put a cable around the tree?

MR. BROWN: No, better let it die. It will be more humane. You choke the tree to death whenever you tie anything around it. Even a light wool string tied around a small twig as soon as it gets wet will tighten and it does not have to be a very strong string to injure the tree.

QUESTION: How do you fasten the cable?

MR. BROWN: With a screw hook. It is a hook with a lock bolt nut. I generally have to give a special order for that; hardware stores do not all carry them, and you can get them in sizes from ⅜ to ¾-inch diameter, standard sizes. We sometimes use them an inch in diameter. You can have them made by a blacksmith, getting a lock bolt and turning the end.

DISEASES OF ORNAMENTAL AND FOREST TREES

BY C. J. HUMPHREY

In order to establish the right perspective, I think it perhaps best to present a general address covering the fundamentals of the subject and to draw on specific examples largely for purposes of illustrating my points and calling to the attention of the Society some of our more important tree troubles. A discussion of forest tree diseases, except insofar as they also apply to ornamentals and fruit trees, is naturally beyond our scope.

In dealing with the diseases of woody plants, we will, for the sake of convenience, recognize three major groups: (1), parasitic diseases; (2), those diseases due to the so-called wound parasites, and (3) non-parasitic diseases.

PARASITIC DISEASES

Fungus or bacterial parasites are familiar to all of you. These attack the living tissues directly or cause functional disturbances in the plant which cause death, or greatly reduce the vitality. Our leaf diseases are of this character, as well as certain bark and twig diseases where the cambium is attacked and killed, this attack often resulting in cankers, or complete girdling and consequent death of the portions above the girdle.

In the case of forest trees and ornamentals leaf fungi do not assume the major importance they do in diseases of fruit trees, where a reduction in actively functioning leaf surface is soon reflected in lessened fruit production. It is true that the leaves of ornamentals are disfigured, "sickly" appearing in case of heavy infections, and often fall prematurely, but the summation of injury to the tree as a whole is usually not considered sufficient to warrant expensive control measures, except perhaps in certain special cases and particularly on nursery trees, where sprays can be readily applied.

Rhytisma acerinum, producing the tar-spot of maples, is about as conspicuous a representative of leaf spots as we have. The life history of this fungus has been well worked out in Europe. The life cycle of the fungus may be of interest, as being more or less representative of leaf spots produced by the group of fungi we term ascomycetes. The spotted leaves fall to the ground in the autumn, usually somewhat prematurely. There is no further development of the fungus on the fallen leaves during the cold winter months, but in late winter and early spring the spots begin to form a new kind of spores in minute sacs (asci). These mature at the time the young maple leaves are developing. The spore sacs rupture and forcibly expel the ascospores into the air, whence they are borne by air currents to the new leaves. Alighting on the underside of a leaf they soon germinate during moist weather and the young threads (hyphae) which are produced enter the leaf through the breathing pores (stomates). Following this infection the spots develop throughout the growing period of the tree. The

disease appears to be spread further by secondary spores (conidia) produced in the spots on the living leaves.

From our knowledge of the complete life cycle of this and similar fungi, then, their control is obvious, namely, the raking up and burning of the fallen leaves in the autumn, so as to eliminate the source of infection in the spring.

Twig and branch parasites are the most destructive organisms with which we have to contend. Most of our tree cankers are produced by fungi developing in the inner bark. If the tree "holds its own" or yields very slowly to the attack, well marked cankers are usually produced. These are only manifestations of a battle going on within the plant tissues between the tree and the parasite.

If the invading organism develops very rapidly, however, we get entirely different disease symptoms, due to rapid girdling, principally of the smaller branches. The historic example of this type of disease in American pathological literature is the chestnut bark disease. This disease was introduced from northern China and first assumed epidemic importance around New York City in 1904. Since then it has spread throughout the eastern United States until it has invaded and practically destroyed the native chestnut stands and planted orchards north of North Carolina, despite the brief efforts to control it. Since the opportunities to apply control measures on a large scale were abruptly terminated, we must in this case do our best to breed a variety of chestnut highly resistant or immune to the disease. Results along this line must necessarily be slow, because we have here a slow maturing crop. Certain native trees in the vicinity of New York City and at Martic Forge, Pa., have shown a high resistance to the disease, and perhaps from these, or similar trees, we may eventually be able to secure a resistant variety.

The chestnut bark disease, however, does not vitally concern Wisconsin horticulturalists and nurserymen. We do, however, have in Wisconsin a white elm disease (Fig. 1), prevalent about Madison and probably widely distributed in the state, which, although milder in its action, is similar in its method of attack to the chestnut disease. This disease is due to a fungus we call *Sphaeropsis ulmicola*, closely related to *Sphaeropsis malorum*, producing canker and rot of the apple. Methods of infection have never been worked out, but since an abundance of spores is pro-

duced on the diseased bark it is logical to suppose that these are distributed by the usual agencies, such as wind and rains. Once infection has taken place in a given branch, however, the disease apparently continues to develop from year to year in the bark and wood.

The striking symptom of this disease is the sudden death of certain of the smaller branches scattered throughout the crown, due to girdling. Below the girdle water sprouts very often develop. Over the attacked areas the smooth bark becomes somewhat sunken and loses the healthy green appearance of the normal bark. From these girdled regions the fungus grows into adjacent healthy tissues. If it progresses downward from a lateral branch into a main limb it may eventually girdle the larger limb. By such progressive growth the whole crown may in time become involved.

Since the disease is known to occur in nurseries, and is epidemic and destructive in character, it must necessarily come under the inspection laws of the state. Every effort should be made by nurserymen to stamp it out, as the white elm is one of our handsomest ornamentals. No man wishes to plant an infected tree, with the certainty that it will ultimately be disfigured by the disease, and very often killed outright. Every diseased tree planted will also affect neighboring healthy trees.

In the case of a disease of this sort we stand a fair chance of eradicating it by applying control measures energetically. In the case of trees already planted for ornamental purposes the cutting out and burning of infected limbs seems to be the logical procedure. Trees too badly infected throughout the crown, however, are best removed and destroyed. Ample watering and fertilization are a valuable aid in hastening recovery. Control in the nursery, in the case of abundant infection, is perhaps best handled by complete eradication. In the case of sporadic infections, careful regular inspections, followed by culling, may prove effective. While the disease cannot be controlled by spraying after infection has once taken place, it may be possible to work out methods whereby the spread may be considerably curtailed.

The white pine blister rust is another of our strictly parasitic diseases which menaces our five-leaved pines, but has produced most damage so far to our native white pine, *Pinus strobus*. This is so familiar to horticulturalists and nurserymen that discussion is unnecessary. Suffice it to say that through the cooperation of

nurserymen and state and federal agencies its further spread from certain proscribed areas has been largely checked. The disease has been known for many years in the eastern states, but was first discovered in western Canada in November, 1921, and a conference regarding it was held at Portland, Oregon, on December 19-20, to discuss the situation and to devise methods to prevent its further spread.

Besides these leaf, branch, and stem parasites there are others which attack roots, ultimately causing the rot of these organs. Among the best known in this region is the honey mushroom, *Armillaria mellea* (Fig. 2). This is a typical mushroom which appears, usually in abundance, in the cool moist fall months about the base of diseased trees or old stumps. It attacks a great variety of plants, conifers as well as broadleaf trees. About Madison it is most common on scarlet and black oaks, and occurs at times on white and bur oak. In the fruit-growing regions one is likely to encounter it on various stone fruits, particularly the cherry. On the Pacific coast it has been reported as a serious enemy of small fruits, as well.

It is one of the common forest fungi and most forest soils harbor an abundance of the "spawn" or black shoe-string strands (rhizomorphs), which spread with great rapidity through humus soils and infect such roots as they come in contact with. The roots are soon killed and ultimately decay to a white pulpy mass. The mycelium continues its growth up the crown roots through the bark and cambium and finally into the base of the trunk. Once the cambium has been killed over a large part of the circumference the tree soon succumbs.

For thirty to forty years pathologists have been experimenting on methods of control. Since the fungus is usually harbored in forest soil the first consideration in connection with fruit-growing on cut-over lands is removal of all stumps, roots, and decaying wood and careful tillage, to eliminate sources of infection as far as possible.

Diseased trees can not be treated with any certainty of success, but pruning out diseased roots, particularly on certain fruit trees, has met with some favor. The line of attack mainly relied upon, however, has been directed toward preventing the spread from diseased to healthy plants. One of the earliest recommendations was to isolate the infected areas by trenching, but this has never been widely applied, and is useful only in the case of definitely localized infections.

Fig. 1. Large white elm trees "stag-headed" from the effects of the elm-canker fungus, *Sphaeropsis ulmicola*. These were removed two years later, after having died back further.

Fig. 2. The honey mushroom, *Armillaria mella*, growing from the roots of a spruce tree. In Wisconsin this is one of the principal enemies of black oaks, rotting the roots and eventually killing the trees.
—Courtesy Dr. W. H. Snell.

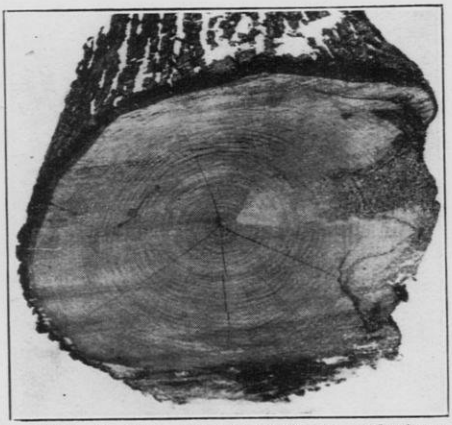

Fig. 3. The rot of *Collybia velutipes*, which has invaded a living basswood tree at a rather large wound near the base.

WOUND PARASITES

Time will not permit further discussion of parasitic diseases, so we will pass to the so-called wound parasites (Fig. 3). These are organisms of various sorts which, while they do not have the capacity of actively invading and destroying living tissue, can affect the life and vigor of a tree to a marked extent. The organisms here concerned can only enter a living tree through a wound in the bark. Having once entered the host they do not attack growing tissue but confine themselves to those parts which are, in a physiological sense, dead. Our most conspicuous representatives of this group are the higher fungi, which we term the basidiomycetes. These are familiar to you as brackets, conchs, punks, mushrooms, etc., which appear on the surface of the wood after infection has developed inside the tree. Certain of them normally attack the heartwood, but the sapwood is also decayed where sufficiently exposed by the injury to permit a certain amount of drying.

These are the cavity-producing fungi which furnish either a reason or an alibi for our tree-surgeons. Their injury to the host is largely due to the reduction in mechanical strength of the trunk and larger limbs, which renders the trees particularly susceptible to windfall. In the case of forest trees, however, the actual loss in timber production is the principal item.

A few of our heart-rotting fungi are apparently capable of gradually encroaching on the normal sapwood in a living tree, but as a rule, there is usually a rather sharp line of demarcation.

Many of the fungi which appear at wounded surfaces do not decay the heartwood to any appreciable extent, and hence are often quite superficial and limited in their action.

Fruit trees are just as susceptible to infection with certain of these fungi as are forest trees and ornamentals, although the better attention they get under approved methods of orcharding tends to lessen the danger.

Young trees, as a rule, suffer little from heart-rotting organisms. This is due largely to the fact that points of entrance for the developing spores of the organisms, such as dead branch stubs, pruning wounds, etc., are usually small and heal over quickly in a young thrifty tree.

The elimination of heart-rot in a living tree is a difficult matter and calls for very careful work. Tree surgery methods are the

only recourse. In many cases of cavity work much of the infected wood still remains, and hence the rot will continue to develop. Mr. Brown has already discussed very competently this phase of the problem. Prevention of infection is much the better line of attack, and this can be accomplished by the use of an antiseptic water-proofing mixture. For small wounds shellac is very good; for larger wounds, except on trees which are likely to be injured by the application, such as peach, cherry, plum, magnolia and tulip, a 50:50 mixture of coal-tar creosote and asphaltum has given very good results. For these trees a mixture of twenty-five parts of creosote to seventy-five of asphaltum may be used. In every case it is advisable to shellac the cut bark and adjoining wood before applying the creosote mixture. This prevents drying out and consequent dying back of the cambium.

NON-PARASITIC DISEASES

When the pathologist can not find a definite causal organism in connection with a disease he usually relegates it to the non-parasitic group. These diseases, then, are usually produced by unfavorable atmospheric and soil conditions, which result in a disturbance of the normal functions of the plant.

Our shade trees are perhaps the greater sufferers from this class of disease. Not only are they subject to injury by soot, dust, atmospheric gases, electricity, climate, etc., above ground, but the roots often suffer for lack of food and water, or become suffocated in poorly aerated soils, or even poisoned by escaping gases. Couple these unfavorable conditions with the activities of noxious insects and various animals, including "tree butchers," and it is a great wonder that the mortality in shade trees is not higher.

To emphasize the necessity of improved fertility, cultivation, etc., in order to correct many of our troubles with ornamentals, I realize is entirely unnecessary with you gentlemen because these are the fundamentals of your profession. The general public, however, is not so conversant with the requirements and each and every one of us trained in the growth and development of plants must act as an ambassador.

Very few cities have an adequate system for the planting and care of shade trees and ornamentals. It must be a municipal problem and not an individual one, in order to consistently follow out

a landscape plan to the best interests of the town or city. Too many of our regulations for the planting and care of shade trees are wholly ineffective for lack of enforcement. Tree planting and politics make a poor mixture—at least to the man on the outside. The officer in charge of shade tree work should know his profession from the roots up. With the necessary authority, and tact in administering it, wonders can be accomplished in the beautification of our towns.

Several years ago I visited the city of Newark, New Jersey. Their tree problems were in the hands of an efficient shade tree commission which had charge of all selection of species, planting, and necessary care of all trees on public highways and in parks. All planting and protection charges were assessed directly against the property, but general costs, such as cultivation, pruning, etc., were covered by general taxation. The system worked admirably under the able and tactful supervision of the secretary of the commission.

I am sure that human nature in New Jersey is not essentially different from that in Wisconsin, and if such a logical, forceful plan will work there it should do so here. In our own city of Madison, in the capital of this great commonwealth, what have we in the way of adequate regulations? Nothing, outside of the splendid semi-official services of our park and pleasure drive association. The owner has full authority over trees abutting his own property. He can do with them as he will, and every act of vandalism possible under any circumstances has been, and is being, repeatedly committed against our trees.

I claim, and wish to emphasize, that the municipalities, through some definitely constituted authority, should exercise full control over all trees on public highways and in public parks. We are having altogether too much promiscuous planting, too much "tree butchery" by irresponsible parties, too little effective and commendable tree surgery, and far too little care and protection for the beautiful trees which have so far withstood the combined attacks of man and nature.

HARDINESS IN SMALL FRUITS

J. F. BARTLETT, MINNESOTA

The term hardiness in horticulture seems to possess quite a wide range of meaning. Prof. N. E. Hansen, who is known throughout the Northwest as one of the best authorities on the subject, says that, "By the term hardiness is understood the capacity to resist against any special condition of environment. So in speaking of hardiness of a plant it may mean hardiness as to cold, heat, drouth, fungus or insect trouble." Mr. Max Pfaender, Superintendent of the Great Plains Trial Station, defines hardiness as "the ability of a plant to withstand the winter without injury to any of its parts." The former definition implies a perfection in plant life, desirable, but hardly attainable, yet establishing a goal for propagators to work toward. The latter probably comes nearer the average fruit growers' conception of what really constitutes hardiness.

Scientists tell us that winter injury is due to the destruction of the cell structure in the tissue of the plant. They do not, however, pretend to know what inherent quality certain species and varieties possess which enables them to survive extremes of temperature without injury while other species or varieties may succumb. They do know that during the growing period there is constant cell activity taking place within the structure of the plant which, in woody plants, gradually diminishes as the wood ripens and finally ceases altogether as the plant becomes entirely dormant. It is during this period of complete dormancy that the plant is capable of greatest resistance to cold. Theoretically, then, it is advisable to select for planting those kinds and varieties which attain the highest state of dormancy and to practice those cultural methods which will cause the plant to remain in this condition during the greatest possible portion of the danger period.

In actual practice, the first step in the solution of the problem of hardiness is the selection of those kinds and varieties of plants which, by actual test, are known to possess the greatest degree of natural hardiness. Experience has taught us that there are really very few varieties of our most commonly planted fruits which

are absolutely hardy in these northern states, that is, varieties which are capable of enduring any extremes of hardship to which they may be subjected. Therefore we have found it necessary to adopt certain cultural methods having for their object the modification of climatic conditions or the protection of the plants from the effects of those conditions.

Having secured the hardiest possible stock available for planting, the next consideration is choice of a suitable location. The advantage of natural shelter such as a timber belt or hill or an artificial windbreak should not be overlooked. Large bodies of water usually have a modifying effect upon extremes of temperature, as in your Lake Superior district.

Another factor worthy of consideration is that of soil. Recent experiments tend to prove that with the brambles, that is, raspberries, blackberries and dewberries a greater amount of winter injury occurs on light, sandy land than on heavier, clay soil, due, no doubt, to the fact that sand is less retentive of moisture, thereby subjecting the plants to injury from drouth as well as cold. On the other hand, over-rich soils have a tendency to prolong growth and retard maturity of the wood.

It is my belief that lack of sufficient moisture is second only to cold as a cause of winter injury to many of our small fruits, especially strawberries. I am convinced that much of the blame which we have been in the habit of attributing to cold rightfully belongs to drouth. The results in either case are similar. It may be that in many cases drouth injury serves only as a contributory factor to injury from cold as it has long been a recognized fact that plants will endure greater extremes of cold where conditions of moisture in the soil and air are favorable than where they are otherwise. It is equally true that plants frequently suffer severely from lack of moisture even though temperatures are unusually mild as during the winter of 1920-1921. While evaporation is reduced to a minimum during the period of dormancy it must be remembered that there is still a considerable amount of evaporation going on even in winter especially in areas where strong winds prevail. It is true that, at that time, the plant is reduced to a minimum of surface exposure. It is also true that it is then that it is least able to replenish its meager supply of moisture because of its inactive condition and the frozen ground. In commercial plantings the supply of moisture is largely beyond our control

except where irrigation is practiced. It would be well to add that there is also some danger from an over-supply of moisture during the fall months which, like over-rich soil tends to retard early ripening of the wood.

Closely related to the question of moisture and soil is that of cultivation which, in a limited measure, produces the same results; that is, it tends to make both moisture and plant food available to the plant thus encouraging a late growth if continued too long.

It is worth while to the fruit grower to be able to recognize winter injury when it has occurred. One of the surest symptoms is a more or less noticeable discoloration of the interior of the plant. Whether the injury has taken place in the bud, the cane, or in the case of the strawberry, the crown, or the root the shade of brown, from light to dark, indicates almost definitely the amount of injury that has taken place.

So far we have considered the subject of winter injury in relation to small fruits in general. It might be well to discuss its effects upon some of the more commonly planted fruits in particular.

Most varieties of currants and gooseberries generally planted throughout this section seem to be sufficiently hardy so that in the case of these fruits we have no serious problem to face. They are less susceptible to injury from low winter temperatures than from occasional frosts during their season of bloom.

The raspberry is found in its natural state over a wide range of latitude from the milder portion of the temperate zone to the northern boundaries of civilization. Its cultivation extends over a correspondingly broad territory with equally varied climatic conditions. There have consequently been developed many different varieties adapted to their respective environments, possessing different degrees of hardiness. It is therefore essential that in purchasing plants the hardiest varieties obtainable be secured; consistent, of course, with other requirements such as productiveness and quality of the fruit. In a series of experimental tests conducted recently by Professor Dorsey and Mr. Haralson some interesting results were obtained indicating a wide variation in the degrees of hardiness among different well-known varieties. It was found that Latham (Minnesota No. 4), King, Sunbeam, Herbert, Miller, Shipper's Pride and Louden showed greater or less degrees of hardiness in the order named. None of the black or purple varieties seemed able to survive without earth covering and on

sandy soil even this protection did not suffice. This practice of laying the canes down and covering with earth, however, is one which many well informed growers favor even with the hardiest varieties on the theory that conditions which may kill the weaker, immature buds near the tips of the canes may weaken the stronger buds further down on the canes which must be depended upon for fruit. Then, too, there is always the possibility of the occurrence of a test winter when practically nothing can survive above ground. This practice, which amounts to a sub-soil cultivation, is also beneficial to the soil.

With regard to blackberries the problem is more difficult owing to a complete lack of any tame varieties which will endure the temperatures of an average winter without killing to the ground. The only sufficient protection seems to be an earth covering which is expensive not only in time required for the operation of covering and uncovering but in loss of crop due to breakage of canes. Incidentally I have known this practice to lead to the destruction of many productive fields of blackberries. In bending down the canes many of them, while not broken completely off, are cracked or otherwise injured in such a way that the sap in flowing through the canes finds its way through these fissures forming a sweet, gummy substance attractive to insects. In this way the plants become inoculated with germs of crown gall or other infectious diseases until whole fields become diseased and must necessarily be destroyed.

None of the tame varieties of black-cap raspberries is supposed to be hardy as far north as central Minnesota. There seems, however, to be at least one exception to this rule. For six or seven years I have had growing at Excelsior a field of black-caps which have never had any protection of any kind yet they have shown little if any more winter injury than a field of Latham raspberries next to which they grow. Plants from this field sent as far north as Winnipeg for trial are reported to fruit well without covering of any kind. In quality and quantity of production of fruit this variety compares favorably with any of those less hardy. As a commercial berry its future is promising.

Dewberries are not hardy above ground although the root seems to be extremely hardy. The plants once established are hard to eradicate owing to their persistent habit of sprouting from the root. They are not a popular berry among commercial fruit grow-

ers because of their tenderness in winter and the difficulty of handling.

Out of some seventy varieties of grapes with which I have had some experience the only one possessing hardiness to any extent in our latitude is Beta. Several new seedlings of Beta will doubtless prove to be equally as hardy and of better quality commercially. Moore's Early fruits for me each year without protection but I would not recommend general planting of it without earth covering.

Strawberries differ from the fruits already mentioned in that the plants do not have so pronounced a period of dormancy as the woody stemmed fruits. Growth apparently ceases entirely but there is not the same appearance of maturing and ripening of the plant structure as in the cane fruits. It is the popular belief that strawberry plants receive their greatest injury during the winter months from damage to the roots caused by alternate freezing and thawing of the soil, but I am convinced that almost if not quite as much injury results from lack of sufficient moisture. It is not only a fact that some varieties are more capable of enduring severe cold than others but that the blossoms of some varieties seem better able to withstand frosts during the blooming season. In this respect the everbearing varieties appear to have the advantage over the June bearing varieties. Professor Dorsey noticed in some observations made last spring that runner plants exhibited a greater degree of hardiness than parent plants in the same hill. Plants which, by a discoloration of the interior of the crown and roots, indicate that they have suffered serious winter injury may survive but it is safe to predict that if they produce any fruit that year the crop will be small, probably consisting of one or two light pickings.

It was for a long time thought that lack of hardiness was an almost unsurmountable obstacle to the successful growing of commercial fruits in these northern latitudes, but we have come to believe that what we at first supposed to be a misfortune is in reality a blessing for were it not for the necessity of originating new fruits adaptable to these conditions the names of many of our most valuable varieties would still be missing from our lists of desirable fruits.

DISCUSSION

QUESTION: Which variety of red do you consider most valuable?

MR. BARTLETT: The Latham, without exception.

QUESTION: Have you tried the Cuthbert?

MR. BARTLETT: The Cuthbert used to give great expectations, but it became so diseased that it has been abandoned entirely.

QUESTION: Do you find the Sunbeam a good producer?

MR. BARTLETT: I did not get much fruit off the Sunbeam. I tried it experimentally, but did not get any berries.

MR. RASMUSSEN: What strawberries do you grow?

MR. BARTLETT: The Minnesota No. 3 promised to be better than the Dunlap when first introduced, but I am sorry to say that it proved a failure. Two, or possibly three years ago some of the plantings of Minnesota No. 3, even at the state fruit breeding farm began to develop a yellowing appearance of the leaves. As far as I know up to the present time no reason for this has ever been found. The plant pathologist of the University examined the plants thoroughly and decided it was simply a breaking down of the variety, and the State Horticultural Society in Minnesota is recommending that no further planting of this variety be made.

MR. RASMUSSEN: Would you add the Dunlap to the list?

MR. BARTLETT: That is largely a matter for the individual grower to decide. Dunlap is as satisfactory as anything we can grow for a June bearer.

MR. RASMUSSEN: What of the Everbearing?

MR. BARTLETT: No doubt the Progressive is the most popular. Minnesota 10-17 surpasses it in some ways, but the trouble with that is that it is not uniform under all conditions. It does well in some localities and in others it does not do well at all. In some places it will run to fruit without making runners or plants, in other conditions it will make plants without any fruit, or very little.

MR. HOFFMAN: It does not multiply very much at best.

MR. BARTLETT: Not very much. It has a tendency to overbear and not ripen all the fruit it sets. It needs a great deal of fertilizer in order to be satisfactory.

QUESTION: What do you say about 935?

MR. BARTLETT: No. 935 is a very good bearer. It is a little later than the Dunlap, perhaps a week. The berries are very large,

good color and good flavor. It is becoming very popular, although it will hardly take the place of some of the other varieties which mature a little earlier.

QUESTION: What about the Minnehaha ?

MR. BARTLETT: Minnehaha and No. 935 are the same thing.

THE IMPORTANCE OF GRADING HORTICULTURAL PRODUCTS

BY PROF. J. W. LLOYD

As they are gathered from the field, the different specimens in any crop of fruits or vegetables are likely to show marked differences in size, shape, color, ripeness, and freedom from blemishes or defects. In the case of many products, the different specimens may be adapted to different uses. Some may be suited for desert use and others primarily for cooking. Some may be in condition to bear long distance shipment or storage for later use, while some may be of value for immediate consumption but not in a condition to carry to a distant market. Different specimens may also meet the needs of different classes of trade. Some consumers may prefer apples that will command a price of ten cents each, while others might not be interested in this class of fruit at all but be in the market for an entirely different grade of stock that might sell for forty or fifty cents a peck. It is also true that some specimens are so poor that their market value is not equal to the expense of marketing, and they may be even worse than worthless if sent to market in the package with better stock. A poor specimen in the same package with superior stock is the most conspicuous object in the package and is likely to interfere with the sale of the entire lot. A medium grade product sells better if packed alone rather than mixed along with a better product.

When shipment of fruits and vegetables from distant producing regions to the large city markets was started, each shipper used his own discretion in grading and packing and there was likely to be extreme lack of uniformity in the goods packed in the same package or in the same lot. It is probable that this lack of uniformity in the products, even from the same shipping point, contributed largely to the development of the commission system of handling fruits and vegetables shipped to the city markets, since

there was no way of determining the grade and quality of a given package of produce except by personal inspection on the part of the prospective customer. The commission system has been criticized but so long as individual ideas or lack of ideals determine grading and packing it is the only system by which certain products can be handled in city markets.

It is true that certain individual shippers have for many years been practicing careful grading and packing; however, many who have tried to be conscientious in their grading and packing have been sadly disappointed by reason of the fact that when their carefully graded goods were consigned to market, the returns were no better than those received by their neighbors who shipped poorly graded goods or even goods packed in a deceptive manner. The general reputation of a shipping point is a strong factor in determining the price of the goods shipped by a given individual from that point. That is to say, where promiscuous or unscrupulous grading is common, a conscientious shipper is likely to gain nothing by his individual efforts when he first attempts to do proper grading and packing. It is true that in time an individual may establish a reputation for his goods, but many who have made the attempt have become discouraged before establishing a reputation and the tendency has been to slip back to the level of the mass at the given shipping point.

Although individual effort has not improved general grading and packing, it is possible for a group of growers at a given shipping point to form an association, establish uniform grading, and put out a sufficient volume of uniformly packed goods to attract the attention of the market. The apple growers of the northwest early learned that one good apple shipped to a distant market will net more to the grower than one good apple along with two bad apples. Association packing of western products has contributed largely to the uniformity in the grading of their products and has helped wonderfully in giving them a good reputation in eastern markets. The individual growers do not grade their own products. All are graded by employes of the association who handle the fruit in an entirely impersonal manner and secure much more uniform grading than can be attained when the grading and packing are done on the farms by more or less inexperienced and transient help.

In some parts of the west, a number of local associations packing a given product have become affiliated for marketing purposes.

In each case the various associations in the affiliation use the same grading and packing specifications. This makes it possible to pack a very large volume of uniformly graded goods and market them under the same brand. Such brands have in some cases been very extensively advertised and have secured a very enviable reputation in the market. The success of the California Fruit Growers Exchange has been brought about partly by reason of the dependableness of their "Sunkist" brand.

While certain organizations of growers in various sections of the country some years ago established definite systems of grading and packing their products, and thereby secured an enviable reputation for the uniformity of their products packed under a given brand, products from other localities continued to be packed in the same haphazard way as of old. The products from the west met with higher favor in the eastern markets than the same type of fruit grown in the eastern states. After the western products had become quite well standardized, promiscuous packing still prevailed in the east. Partly as a matter of protection of their own industries certain states have passed apple grading laws, and a few have passed laws governing the grading of other horticultural products grown within their borders. In most states these laws are mandatory. Unfortunately, the specifications in the different state laws for the grading of the same products show considerable variation, so that the "A" grade of apples, for example, packed in one state may be quite different from the "A" grade packed in another state.

To overcome these and other difficulties and if possible to bring about the use of the same specifications for the same grade in all the states, the United States Bureau of Markets has proposed grade specifications for apples and a number of other horticultural products. If all states would adopt these same grade specifications and either incorporate them into their state laws or empower their state officials to promulgate rules and regulations regarding grading that would include these specifications, it would be possible to have a certain grade mean the same thing in all states, the same as is true of cotton and corn. Such a state of affairs would greatly facilitate the transaction of business involving the sale or purchase of horticultural products. It would no longer be necessary for the prospective purchaser to personally inspect each package of goods or even a few packages in a given lot. Instead, the grade

marked on the package or quoted by wire would give an accurate idea as to the quality of the goods involved.

In standardized grading there should be a sufficient number of grades provided for to make it possible to place all of the salable products in one or another of the given grades. Even now growers of greenhouse cucumbers, for example, recognize at least six distinct grades of their products and each grade is branded in accord with the facts. The time should soon come when it would be considered no disgrace to brand a package as No. 2 or even some lower grade if that is what it really is. The old practice of omitting grade marks from all except No. 1 stock should be abandoned. Facility in trading and the elimination of the necessity of inspecting every package cannot be brought about until the brand is made to tell the truth.

In many grading laws the grade specifications include the requirement that the goods must be "properly packed." The exact meaning of "properly packed" varies somewhat with different commodities, but in general it means that the package must be sufficiently well filled and tightly packed so that the package shall be full upon arrival in market and that the specimens shall remain in the exact position in which they were placed and not be bruised. It also implies that the arrangement of the specimens in the package shall be in accord with accepted practice. In the packing of some commodities this means that each individual specimen shall be placed by hand in a definite position in the package and that specimens in the top or facing layer shall be arranged in a definite manner in reference to one another and to the cover of the package. The ethics of facing apple barrels has long been a point of contention. Accepted practice prescribes a certain arrangement of the specimens. The main differences of opinion are as to the quality and particularly the color of the specimens in the facing layer as compared with the rest of the fruit in the package. Some states have made definite specifications in their laws covering this point, but wide differences on this point appear in the different state laws. Concerted action among the states in respect to this matter is greatly to be desired.

Even in the case of goods regarding which there are no grading or packing laws the arrangement of the specimens in the package or wherever exposed for sale has a definite bearing upon their attractiveness and therefore their salability, regardless of the in-

trinsic value of the goods themselves. And manner of presentation of goods, especially on the retail market, will have a definite relation to the readiness with which they may be sold. Even though grading and packing may become sufficiently standardized to make possible wholesale trading without inspection, the ultimate consumer will continue to eat with his eyes. Retailers could greatly increase their sales of horticultural products by the use of effective window displays. Goods packed for shipments should be so arranged in the package that when the cover is removed, no rearrangement of the contents will be necessary to make an effective impression if the package is placed in a show window.

Reference has been made to the common practice of association packing in the west, and the advantage thus attained in reference to uniformity of grading and packing. Some localities in the east are just awakening to the fact that a community packing house is very desirable from the standpoint of securing uniformity in the output. When this method of packing is employed, it is also practicable to install better facilities for grading and packing than can readily be provided by the individual grower for doing his own packing. In most cases the grading and packing can be more economically performed in a central packing house than on individual farms as well as being done in a better manner. An efficient group of workmen can be trained and thorough supervision given the work by an experienced foreman. In the case of products which can endure a few hours' delay between picking and packing without deterioration, handling through a central packing house is highly desirable. It is much easier to secure uniform grading under the conditions provided by such a house.

Another advantage of community packing is that it is likely to lead to cooperative selling. It is also likely to raise the standards of all growers in reference to the quality of their product as it comes from the field, since no one relishes having a higher percentage of culls found in his product when graded at the central packing house than is found in the product of other growers hauling to the same house. The central packing house is a means of keeping poor products from spoiling the sale of good products and makes it possible to establish a good reputation for the products of a whole community. The present trend in progressive horticultural communities is toward the use of central packing houses where standardized products may be packed expeditiously

and sold under definite brands that have a distinct reputation with the trade.

BETTER FRUIT IN BETTER BASKETS

F. P. DOWNING, SOUTH BEND, INDIANA

The topic assigned me on the program "Better Fruit in Better Baskets," with your permission, will be changed to read, "Better Baskets for Better Fruit." In other words, I wish to talk about the basket first. Following this, I will emphasize the need of careful grading, packing and loading. My remarks will be confined to the manufacture and proper use of the round stave basket in its various sizes. First of all, I will very briefly explain the process of manufacturing baskets, following which the proper methods of packing, loading, storing and marketing fruits and vegetables, particularly apples, in bushel baskets, will be discussed.

PROCESS OF MANUFACTURE

There are about sixty round stave basket factories in the United States. In the north baskets are made largely from maple, beech and birch staves with elm hoops and other varieties of wood for slats. After the logs have been hauled to the factory they are cut into proper lengths, placed in large vats where they are either boiled or steamed softening the wood so it will be in proper condition for cutting. After the bark has been peeled from the log it is placed on a lathe and cut into veneer. The veneer is run out on long tables at the end of which a clipping machine cuts it up into slats, hoops or staves.

To manufacture good baskets the stock must be carefully sorted. All staves and hoops that are defective must be thrown out. This involves the sorting out all dead wood, cross grained and knotty staves. If the sorting is not properly done it will materially affect the strength or carrying power of these baskets. From the sorting table the staves are taken to web tables where they are made into basket webs. Care must be taken in this operation to see that the edges of the staves are in line and that none project. The webs are then taken to the basket machine.

Hoops, like staves, must also be carefully sorted. The top inside hoop is stapled on a hoop machine. It is then slipped over

the basket form and the web placed in vertical position. A device known as a follower then bends the web over the form and the two outside hoops are placed in the machine and stapled to the basket. The basket is then removed, inspected for defects and additional staples driven into the end of the outside hoop. It is then taken to the handle machine for the insrtion of two wire handles.

After the handles are inserted the baskets are placed outside in the sun to dry. After thorough drying, to prevent molding, the baskets are stacked in nests of one dozen each and removed to the storage room where they are laid upon their sides in long rows. A few small factories still make bushel baskets by hand. This, however, is too slow a process and most all factories are now equipped with automatic machinery which enables them to turn out large quantities.

In the manufacture of basket covers, machinery is also widely used. The cover hoop is first stapled on a hoop machine, then placed in the cover machine and the cross slats laid in position. Following this, the staples are securely driven through the slats and into the cover hoop. The covers are then tied in bundles of twelve, dried and are ready for storage or shipment.

The problems arising in the operation of a large basket factory are oftentimes many and serious. Good logs are becoming very difficult to secure. Skilled labor, so essential in cutting good veneer, is difficult to obtain and serious delays frequently arise in a rush season through breakdowns of machinery. Even in the best managed plants it is frequently difficult to fill rush orders sent in by the fruit grower at the last minute. In buying baskets it is always wise to anticipate delays and place orders well in advance of the time when wanted.

REQUISITES OF GOOD FRUIT BASKETS

In the marketing of fruit the container plays a very important role. It is quite essential that the fruit grower selects his packages with unusual care. Is his market close at hand? What kind of container does his market prefer? Is the fruit to be stored? What about packing costs?

In purchasing baskets the growers should give attention to the following points.

1. Strength of carrying power
2. Capacity or volume
3. Shape or form
4. Attractiveness
5. Convenience in handling and packing
6. Ease in inspection
7. Nesting
8. Assembling
9. Cost

Unfortunately, no container possesses all of the above requisites of an ideal container. I believe, however, that the bushel basket, properly made, will come nearer to filling the bill than any other container now manufactured. Its increasing popularity and widespread use are a silent testimonial of its usefulness.

Let me point out the requisites of a good basket. Strength is all important. The basket must be cut from good stock of the proper thickness. Maple and beech staves must not be cut less than one-eighteenth of an inch in thickness and gum one-sixteenth of an inch. Cottonwood, pine and poplar do not make good staves. The hoops should be cut preferably from elm. Single hoops one-seventh of an inch in thickness make better baskets than double hoops. The lower hoop should be well down on the basket to give proper strength.

Staples should be cup-shaped so as not to cut or bruise the fruit. Handles must be driven through both top hoops and placed exactly opposite. They must be of the proper height to permit of a good commercial pack. Bottoms must have a good concave with tight fitting staves. The old loose woven round bottom basket will no longer satisfy fruit growers.

Covers must be standardized and fit the baskets. Cover hoops must rest on the outside rim of the basket so as not to cut the fruit. Star covers are preferable to all other styles as they give added strength where needed. Handle slats must be cut just wide enough to fit snugly beneath the handle. Narrow slats allow a sidewise movement of the cover that injures the top layer of fruit.

Manufacturers are not all making baskets of the same grade and strength. Growers can be protected by buying baskets on definite specifications or by purchasing their supply from factories that have established a name for their product and who sell under an approved brand.

Because of the tendency of the public to buy in small quantities, large containers, like the apple barrel, are losing in popularity. Bushel boxes and crates are taking their place. The basket is more popular in the east and the apple box in the west. The basket has a number of advantages over the box. It comes ready for use, is easier and more cheaply packed, displays the fruit to better advantage, has handles for convenience in carrying and can be used about the home after emptying.

Until quite recently the basket was not considered a good package for storing apples. The development of the modernized, wide bottom basket with straight sides of heavier construction is fast changing the ideas of the trade in this respect. The past two seasons, apples have been stored with success in New York, Ohio, Illinois and Kansas. With high storage rooms decking is necessary, it not being advisable to store baskets over eight layers high. Varieties of apples subject to scald like York Imperials and Greenings keep better in baskets than in barrels as there is more ventilation. Baskets take up no more storage room than a barrel and can be handled in and out of storage in less time and at a smaller cost.

With but a few days training anyone can learn to pack apples in baskets. Several methods of packing are in common use. The jumble pack is the quickest but not always the most desirable method to follow. The apples are poured into the basket, shaken down, smoothed over on the top and the cover inserted. Most growers now ring face the fruit. The basket is nearly filled, a shaker put over the top and the basket given several sharp jerks. The shaker gives a tight pack and a foundation for the top layer. The apples are then arranged in concentric rings, beginning with the outer ring. A pad is placed over the fruit and the cover put in place. Last year, what is known as the 19-inch pad, came into very general use. This pad is wider than the basket and prevents lid bruising and cutting. Pads should always be placed with the smooth side next to the fruit.

For fancy pack, some growers resort to ring packing. The apples are placed in concentric rings in the bottom of the basket instead of being jumbled as in the two methods already described. Each layer is built in the same manner. This method of packing is more expensive and best results can be obtained only when the apples are carefully sized. When this is done a count basis similar to box apples can be worked out.

For L. C. L. and express shipments the cover should be attached to the basket with wire fasteners. Several types of these fasteners are now in use. A popular type is a hook with a straight end. The hoop is slipped under the top outside hoop of the basket and the straight end bent over the cover rim holding it securely against the top of the basket. Either two or four of these fasteners can be used.

What is known as the four handle basket is preferred by some growers. This basket has two extra handles and an additional cross slat which is slipped under the handles, held in place with a nail or tack driven in the cover midway between ends.

Apples can be carefully packed and graded in well constructed baskets and yet not arrive at destination in good condition if proper attention is not paid to careful loading. Several methods of loading baskets in cars are in general use but perhaps the very best method is what is known as the End-to-End or Three-three method of loading. This method has a number of advantages over all other styles. For example, it gives an increased number of baskets for the same height, it is easier for the average loader to secure a tight load lengthwise, it requires no bracing at the doorway to take up lengthwise slack and it usually leaves the packages in the doorway in an even and uniform position so that the inspector or receiver gains a good first impression of the carload. Detailed instructions for loading by the End-to-End method can be obtained by writing to the Package Sales Corporation, South Bend, Indiana. Best results in loading apples by this method are obtained when the apples are not loaded over four high but where the minimum is 30,000 pounds it is possible to load five high if good baskets are used and the directions for loading carefully are followed.

BRANDING

Several methods of branding or labeling bushel baskets are in common use. Probably the simplest and cheapest method is the stenciling of the grower's or packer's name, address, grade and variety of apple on the handle slat of the basket. Other shippers use a colored gum label not exceeding two and one-half or three inches in width. This is pasted on the cover slat. Still others use beautiful lithograph labels placed between the pad and cover of the basket. When the cover is removed this label shows up to advantage.

Bushel baskets are preferred by retailers because they make the very best display package on the market. The raised cover prevents the basket from having a slack pack upon arrival at destination. The concentric rings of a well packed basket make a most successful appeal to the buyer. People today buy largely by the eye. Color and size determine the price.

Selling by the basket instead of by the dozen is becoming the general rule. This means buying in larger quantities which increases consumption and helps the grower secure a market for his fruit. It is decidedly to the advantage of both grower and shipper to market apples in the best display package. Finally, the *empty* basket has a value. It is used about the house for many purposes, in the laundry or kitchen, in the barn and oftentimes in the furnace room. Economical buyers consider this point when making their purchases and for that reason use bushel baskets in preference to other containers.

OVERHEAD IRRIGATION

J. R. WILLIAMS

It might be a good plan to tell you how I got interested in irrigation. Seventeen years ago I finished the short course and soon after got a job running a pumping plant at Santa Anna, California. Often while watching the water on its way to the crops I would think, "why can't we irrigate in Wisconsin, for we have so much water going to waste?"

I think irrigation has been the most talked of subject by the gardeners and small fruit growers the past summer. There are a number of different systems of applying water to a crop, but there is only one system that is practical in Wisconsin, and that is the overhead system.

I have fourteen acres piped, but by moving the lines we watered about twenty-two acres the past summer.

When installing an irrigation system the supply of water is the most important thing. A lake or river is the most reliable supply for a large outfit, while wells or city water will do for a small acreage.

Next after the water supply is a good intake. If we are pumping from a lake or river an intake that will let in plenty of water

for the size of pump we are using and at the same time keep out all weeds and dirt, for a few weeds pumped in an overhead system will cause trouble all summer. The lake I pump out of is very weedy, and I tried a number of intakes before I got one that would do the business. The intake I use now is a box 2 by 2 by 5 feet. The top, bottom and ends are made of matched pine flooring, the sides are first covered with heavy galvanized screen, then covered with 60-mesh brass screen. Main supply lines must be laid so they can be drained during the winter.

A plunger pump is the best for an outfit using 10,000 gallons or less per hour. For a large outfit a centrifugal pump is cheapest.

The first system I installed I used nine-foot posts. The lines I am putting up now I use seven-foot cedar fence post, and I like them better than the high post, for it is so much easier to clean the nozzles when you can reach them from the ground.

The cost of installing an overhead system will run about $250 to $400 per acre without the supply line and pumping plant.

I have used irrigation on a number of different crops—strawberries, raspberries, onions, cabbage, melons, cucumbers, potatoes, tomatoes and flowers. It is nearly impossible to grow a good crop of everbearing strawberries without irrigation. I think irrigation will increase a crop every year, and a dry year like last summer it will increase it 200 or 300 per cent.

It is impossible for me to tell you when to water any more than morning and evening is the best time to water. Some crops may be watered in the heat of the day without hurting them, such as cabbage, cucumbers, melons and onions, while other crops are liable to blight if watered while the sun is shining. Irrigation is a great help in starting seeds. They will come up even and make strong plants. With irrigation we can set plants at any time and get a good stand.

A crop can be saved from a heavy frost by the use of an irrigation system. For protection against frost we should start spraying about midnight and water until sunrise.

Weeds should be killed as soon as they sprout for if they get to be any size it is nearly impossible to kill them on irrigated ground.

While the first cost of irrigation seems high it has been a money-maker for me every year since I installed the system.

DISCUSSION

MR. KERN: What is the approximate first cost of installation per acre?

MR. WILLIAMS: Well, there are different companies at different prices. Some companies are quoting $200 an acre, other companies from $250 to $400 per acre, that is, less post cost, or supply, or pump.

MR. RASMUSSEN: What is the length of the line?

MR. WILLIAMS: Fifty-two posts, eighteen feet apart, we have lines of different lengths.

THE CHAIRMAN: What is the extreme length?

MR. WILLIAMS: We find it practical to use a line about 200 feet long.

THE CHAIRMAN: How much of that is inch pipe?

MR. WILLIAMS: Ninety feet three-quarter inch on the outer end, 100 feet inch pipe and about 110 feet inch and a quarter pipe; if you go any longer than 100 feet line it really runs up the expense of posts, so we put up the main line, use all galvanized pipe on the overhead lines; buying inch and a half to two-inch pipe, it runs up into money in a hurry.

BREEDING APPLES FOR THE UPPER MISSISSIPPI VALLEY

BY S. A. BEACH

Secretary Cranefield requests that I give at this time some account of my work at the Iowa State College at Ames in breeding better apples for upper Mississippi valley fruit growers.

The variety question is not a matter of prime importance to the orchardists in those apple growing districts where they have already a sufficiently large list of varieties the trees of which are hardy and the fruit of which will meet the ideas that the people have in mind who are growing fruit, whether it be grown for domestic use in the home orchard, or whether it be grown in commercial orchards.

In the eastern states the variety question is practically settled and has been for a generation or more. The leading winter apple in the east is the Baldwin; next to that comes the Rhode Island

Greening; next to that the Northern Spy; then they have their summer apples and their fall apples. It is not a question with them of whether or not the tree will be hardy, it is simply a question of, "Which variety do you prefer to grow?"

In the Pacific northwest the variety question has been settled practically for all the important apple growing regions. In the Wenatchee valley they grow Jonathan and Winesap; in the Hood River valley they grow Yellow Newtown, Esopus Spitzenberg and Ortley. The men who are leaders in commercial horticulture in Oregon at this time are not seeking for hardier varieties of apples to plant, but they are urging fruit growers to select those apples for planting in commercial orchards which will give fruit of the best quality and of the best marketable appearance.

That condition does not prevail in the region which extends from Lake Michigan to the Rocky Mountains, at least not in that part of it which lies north of the southern boundary of Wisconsin. The man who wishes to go into commercial orcharding in this region,—and southeastern Wisconsin, is perhaps most favorable so far as climatic conditions are concerned of any portion of this vast region,—the man who wishes to go into commercial apple growing in this region, and who has to ask himself, what is the best apple which I can plant for a good winter variety which can be put into the general markets of the country, St. Louis, Pittsburgh, New York, Chicago, Baltimore, Boston, and successfully meet competition with the standard market varieties, has a problem before him which has not yet been satisfactorily answered. If it has been I should like to be informed. I cannot answer it, and I doubt if there is any man in the room that can answer it satisfactorily. That is not saying that we do not have in this region varieties that are sufficiently hardy to give us desirable market apples for summer and early fall, but when you go beyond the season of the Wealthy, we do not have as desirable later keeping varieties as this region needs.

The region which I have indicated is a rich agricultural region. Including that part of it which stretches into the Canadian country north and northwest, it has a present aggregate population, I should say, of probably fifteen millions. Inside of twenty-five years it will probably have twenty-five to thirty millions of people. Perhaps in Wisconsin they are not shipping in as many apples from the outside as they are in other portions of this district, but

speaking for Iowa, I heard a well posted man in the fruit business give an estimate the other day that this year Iowa is shipping in probably three thousand carloads of apples. Now, I believe that with the proper varieties, Wisconsin and Iowa can grow all the apples they need at remunerative prices and sell the surplus to a portion, anyway, of this vast population which is surely going to consume fruit and fruit products in increasing quantities and which will afford a fine market for the products of the orchard.

As a student at the Iowa State College I first became interested in this question of developing better varieties by importing and by breeding. The courses in horticulture there were under a man who at the time was regarded as one of the leaders in American horticulture, Prof. J. L. Budd. He, as you know, was instrumental in bringing into this upper Mississippi valley a great many hardy varieties of fruits, trees and shrubs, largely from Russia. The botanist, Doctor Halsted, was interested along the same line. The man who was president of the institution when I entered, in 1884, Dr. Seaman A. Knapp, was at that time a leader in agriculture and I understand was the man who wrote the first draft of what afterwards became the Hatch act for the establishment with federal funds of the State Agricultural Experiment Stations. Later, as you may recall, he went into the south and developed there the idea of county agricultural demonstration work among farmers, which was the beginning and which also really developed into the successful organization of the present type of farm bureau and home demonstration movement. So highly was he regarded as an agricultural leader in the south, that the people of the south have erected to him a monument at Nashville.

Under such leadership there developed a group of students at the Iowa State College who were interested in improving fruits and grains and who since then have been more or less closely identified with work along those lines in America. W. M. Hays was one of them. He went to the University of Minnesota, and as professor of agriculture there instituted cereal breeding at that institution. I was told a few years ago that one of the wheats which he originated, Minnesota 169, was then being grown so successfully in Minnesota and yielding so much better than the ordinary wheats that it was adding not less than a million dollars annually to the wealth of that state. That was but one of the many valuable new varieties which Hays originated. Prof. N. E. Hansen, now of Brookings, South Dakota, who has done so much

for the improvement of alfalfas and fruits was one of my college classmates at that time, as was also Prof. John Craig, afterwards professor of horticulture at Cornell University, and for many years previously engaged in fruit breeding for Canada at the Dominion Central Experiment Farms at Ottawa.

Immediately on graduation I went into the nursery business and acted as sales manager with one of the large nurseries in western Iowa. That experience gave me an opportunity to see the orchards as they were actually living and dying over central and western Iowa. A most valuable foundation experience for later work in apple breeding it seems to me was that which I had in this nursery experience, and in the experience of going over a wide area of this central plains country and seeing the way in which many of the old orchard varieties were suffering from climatic injuries in this region. I soon became convinced that most of the varieties which were called the standard varieties, and especially the standard winter sorts were not meeting the situation.

When in 1891 I was made horticulturist of the State Experiment Station at Geneva, New York, I began at once breeding fruits, grapes, pears, strawberries, raspberries, and apples at that station. I first began apple breeding by producing some pure bred seedlings of the Esopus Spitzenberg. Later I took up the proposition of trying to combine the productiveness and color of the Ben Davis with varieties of better quality, and made crosses of it with such varieties as Mother, which you know is a red apple of high quality in season about Thanksgiving time, Jonathan a standard red apple of high quality, Esopus Spitzenberg, one of the best in quality of red winter apples, and Green Newtown, a late keeping firm-fleshed green apple of high quality. Other combinations made were McIntosh with Lawver; Northern Spy with Rome Beauty and with Ralls Genet. I then brought these new seedlings into fruiting.

After fourteen years service, I left the New York station to take up the work with which I am now connected in Iowa. At that time I was not yet convinced that any of the new apples which I had originated at Geneva were sufficiently valuable to be worthy of introducing to cultivation, but my successor, Doctor Hedrick, has since named and introduced a large number of them, giving them names of the counties in New York state, as West-

chester, Cortland, Saratoga, Schenectady, and so on. My own personal opinion is that I have yet to see any one of those New York seedlings which I originated which is of sufficient value to give it promise of becoming permanently established as a variety of commercial merit for planting in commercial orchards, although some of them have a good deal of merit.

When I returned to Iowa in 1905 as head of the horticultural work at Iowa State College, I was also put in charge of the several trial stations of the State Horticultural Society in different parts of the state. At one time the Iowa Horticultural Society had eighteen such stations. By 1905 these had been reduced to about seven or eight, among them one at Charles City, of which Mr. Charles G. Patten was the station keeper.

The state society gradually reduced the number of its trial stations till finally only the one at Charles City was left and the small available funds were all turned to the support of that station, because we recognized that Mr. Patten was doing the most important work in fruit breeding of any of those stations. Afterwards, with the assistance of Capt. C. L. Watrous of Des Moines, for many years president of the American Pomological Society, and Col. G. B. Brackett, pomologist of the United States Department of Agriculture, arrangements were entered into, whereby the United States Department of Agriculture joined with the State Horticultural Society in the financial support of the fruit breeding work of Mr. Patten at the Charles City trial station, with the horticulturist of the Iowa State College cooperating.

Later, about three or four years ago, I succeeded in having seventeen acres of the Patten fruit breeding tract purchased by the state to preserve and maintain the more important fruit breeding material which Mr. Patten had collected or bred there, and requested that Mr. Patten be added to the state experiment station staff as an associate in plant breeding. This was done, and Mr. Patten held this position until his death, which occurred two weeks ago last Monday on the 28th of November.

There is not time here to speak more than briefly of Mr. Patten's lifetime efforts in fruit breeding. You are all, probably familiar with the Patten Greening apple, which is noted for its hardiness, and has proven to be a good bearer over a large part of this territory which we have been speaking of and westward so far as anybody has found that apples can be grown in the central

plains territory. Of course, if you go too far westward into the arid country, you get beyond where any apples can be grown.

Another one of Mr. Patten's apples is called the Brilliant, an autumn apple that belongs in the same class as the Fameuse and the McIntosh. Mr. Patten also has originated some seedling pears, a few of which we are now beginning to offer for distribution. He has also bred some valuable seedling plums. Any of you people who are interested in getting some really superior plums of native species if you will apply to our station, we shall be glad to send you a limited quantity of bud wood or scion wood, so that you can cooperate with us in testing in Wisconsin some of these better varieties of American plums.

Referring again to the fruit breeding work which I took up on coming back to Iowa in 1905, I will say that I immediately began the crossing and self-breeding of apples of the best of the hardier winter kinds which are found in Iowa, and sending to other regions for pollen of the varieties of superior quality, such as Esopus Spitzenburg, Newtown Pippin, etc., so as to lay a foundation for breeding here winter fruit of better quality borne on hardy trees. After having carried that work on in Iowa now for about sixteen years, I can say to you that I am beginning to see some very encouraging results.

In all, I suppose that we have used in this Iowa work perhaps as many as one hundred different varieties in various combinations. My first effort was to use an extensive list, and then when there was accumulated sufficient evidence as which were the best breeding lines judging from the seedlings which were produced by those parent varieties, either when self-bred or when crossed in different combinations, I planned to take up the work again with a narrower selected list. That is what we are now doing.

Among the parent combinations which have given us excellent results is the Wealthy crossed with Northwestern Greening. This combination is giving us hardy seedlings of vigor that make thrifty, large trees, bearing fruit of good size, and many of the varieties are of good quality. Oftentimes they are as beautiful in color as the Wealthy, and extend beyond the Wealthy season; some of them probably will run into the winter season when grown where we are at Ames. There the Wealthy is far enough south so that it becomes an early fall apple. It is picked commercially in late August or early September. Of course, as you go further north, it becomes a later fall apple.

Another combination of parentage which we have found very desirable is the Jonathan with Salome. Some of the best of the seedlings that we have produced are of this combination. Another good line is the MacIntosh with Longfield. We do not get very late winter apples from them, although some will keep into the winter, but we do get a number of fall apples of much merit. Besides these we have a long list that we have tried of various combinations of parentage, from which have come some other seedlings of evident merit which I might mention, but I will not take your time longer on this portion of the topic.

I will simply at this time call attention to some of the samples which I have brought here, and which I am going to leave in the hands of Mr. Marken and Mr. Goff, so that any of you who are interested can sample the fruit later.

This first red apple is a seedling of Wolf River by Harrington. Harrington is one of our red seedling apples of unknown parentage. It was produced at our station before I joined the staff at Ames. It appears to be a seedling of Scott Winter possibly crossed with Jonathan. This apple hangs well to the tree, and is in season from September to Thanksgiving, or can be kept possibly until Christmas in good years. This year we find that apples ripened from a week to ten days earlier than usual.

Second, this green apple is one which appears to us the best green winter apple that we know for growing north of the Grimes Golden belt. It makes a thrifty tree with well shouldered branches, has stood the climate without any signs of injury at Charles City in the nursery, and at Ames, where we have it growing top-worked in the orchard and in the nursery, as well as the original seedling tree. In quality at this time of the year it is rather sharply acid, and for those who like a mild flavored apple it would not be regarded as good for a dessert apple; but later in the winter, when it gets mellow, it becomes a very pleasant dessert apple. Always it is a good culinary apple. I think it compares very favorably for cooking purposes with Rhode Island Greening. It appears to be a regular cropper and a good bearer. This year it had but a light crop, because we had a succession of spring frosts which hit the blossoms, and we did not have as heavy a yield on that account.

Third, this other red apple is perhaps the most promising variety among those we have tested up to the present. The tree

is a good, thrifty tree, has shown no signs of winter injury, and appears to be a regular cropper. It gives a fair crop of fruit, even this year. One of its parents is the Perry Russet, which many of you know, because it has been grown quite widely in Wisconsin. In fact, I think it was named in Wisconsin, after having been brought here from Perry, Wyoming county, New York. The other parent is an apple known as Allen Choice, a small winter apple of good quality. Allen Choice is a hardy tree, and the fruit keeps until February or March in very good condition, as grown at Ames and vicinity. It is an apple of mild flavor and very good quality. In fact, it is one of those varieties which has sold itself by reason of the people asking the nurserymen for it. It is not a good commercial variety for the general market, because the fruit is too small. The Allen Choice at Iowa State College this year was loaded so heavily that the branches touched the ground.

I have put here by the side of this seedling a couple of apples of the Baldwin. I stopped at the corner grocery and asked them to give me a couple of Baldwin apples, and the grocer gave me those two. If you wish to compare them with the Ames as to quality, I shall be pleased to learn afterwards what your opinion is.

Now, so much for the reason for undertaking the work, and so much for the present status of the work as we have been pushing it forward in our section of the upper Mississippi valley. I am frank to say that I regard this as a very important line of work. If we can produce fruit like that which I am here showing you and if we can have 100 per cent stand in the orchard, this last mentioned red seedling we believe can compete in commercial plantings with such standard sorts as Baldwin and Ben Davis. There are not very many of our orchardists producing winter fruit with a 100 per cent stand of orchard trees; probably most of them have not got 50 per cent stand. How many of them, if they can grow fruit like this in an orchard with a 100 per cent stand after the trees come to bearing age and can maintain it for a reasonably long period would not regard this as a desirable commercial apple. Although it is not as high quality an apple as the Jonathan, it rates good to very good.

We have thousands of other seedlings that we are yet waiting to fruit. Among them we are confident will be found other kinds which will prove valuable for planting in this region. My own opinion is that the people of this upper Mississippi valley might

well give better support to work of this kind, not only for our children and our grandchildren, but even for ourselves, because I do not see any reason why many of the people who are before me in this audience may not in a very short time get supplied with apples of this kind, and supply a local market, and if you have a surplus, can feel certain that the general market will take them. I thank you for your attention.

DISCUSSION

MR. TOWNSEND: I should like to ask Professor Beach if it would be possible to cross the Hansen Plum and Montmorency Cherry? I have for a long time seen the value of the breeding of Montmorency, and I should like to ask if it can be crossed with the Hansen Plum.

PROFESSOR BEACH: Hansen used the Satsuma and the Burbank in his crosses on the Sand Cherry.

MR. TOWNSEND: Do you think a cross of that kind would give it hardiness?

PROFESSOR BEACH: I do not know of any definite cherry crosses of that kind. I remember that Mr. Theodore Williams, late of Benson, Nebraska, claimed, as I recall it, to have made a cross of the Montmorency Cherry with the Sand Cherry, which he designated under the name of Montbesseyii. I have raised a great many seedlings of it. The second generation had some fruits of good quality, but practically none of them that I would regard of sufficient value to be worthy of the attention of the planter. I would not say that crossing the cherry with some of the Hansen plums could not be done, but I do not know of its being done successfully.

MR. TOWNSEND: The good plums of the Hansen hardy sort will not bear, and if that quality could be retained and crossed with the cherry, or even with another plum, it would be a condition worthy to consider.

MR. KERN: At what age does your red seedling tree fruit?

PROFESSOR BEACH: I do not recall now, but as I remember, it fruited at about ten years of age.

MR. KERN: What is the combination in the green apple?

PROFESSOR BEACH: That green apple is a selected seedling. In starting the work of breeding back in 1906, the first spring after I arrived at Ames, I immediately went over a neighboring nursery where they had seedlings growing from a lot of seed imported from northern Vermont, for the purpose of using them for

seedling stocks. From among thousands of these trees I selected several hundred for top working, so that I could bring my own seedlings into bearing quicker. In top grafting these trees I usually left one branch of the stock to fruit. This green apple comes from one of those selected stocks and really a selected seedling, the original seed having come from northern Vermont. We do not have a very close line on its parentage but I would think possibly that its parentage may be the Bottle Greening, or some of those hardier Greening types that are known in northern Vermont.

FRUIT GROWING IN THE MIDDLE WEST—ITS DECLINE, ITS FUTURE

BY PROF. LAURENZ GREENE

Measured in statistical terms there has been an alarming decline in fruit growing in the middle west, particularly in the decade marked by the census period from 1910 to 1920. To those fruit growers living in the specialized fruit growing districts on our two coasts, this may indicate a climate and soil unsuited to fruit culture, thus enhancing the potential value of their holdings. Does a careful analysis of existing conditions indicate that fruit growing in the middlewest is not now profitable and will not prove profitable in the future.

I shall arbitrarily fix the middle west to include the two governmental groupings of the east north central states and the west north central states. This area is bounded on the east by the Ohio and Pennsylvania lines; on the south by the Ohio river, and the south line of Missouri; on the west by the west lines of Kansas, Nebraska and the Dakotas; and on the north by the Canadian border and the Great Lakes. The Ozark region of Arkansas and the hill orchards of Kentucky might well be included but limits must be placed somewhere. This area includes the famous "corn belt" and a few states besides. It is a general farming;—a corn and hog country. It is a territory of which the American people may well be proud, not only because of the wealth of food produced but also because of the type of civilization it has developed. Nor would any fruit grower within its border wish to make it less predominantly a general farming region for in this extensive farming area the intensive farmer finds an easy and an adequate market.

This middle western territory contains a population equal to about one-third of the total population of the country. If we may further subdivide the middle west, we find 20 per cent of this total population east of the Mississippi and about 12 per cent west of that great river.

According to the census report of 1920 the bearing apple trees of this section are about one-third of the total number in the United States thus making the ratio between bearing trees and population about equal as compared with the whole country. With the other tree and bush fruits the section is much less fortunate.

It is, in the main, a farm orchard and farm fruit garden territory. There are only a few well defined fruit growing districts. The growers in general lack that close contact with one another which many feel develops a more progressive horticulture. We do find extensive commercial plantings in a few regions. Commercial apple plantings are found in southern and eastern Ohio, in western Michigan, in southern Illinois, and western Illinois, in southern Missouri and along both banks of the Missouri river. Peaches are extensively planted in southern Ohio, in western Michigan, in southern Illinois, and southern Missouri. Commercial cherry plantings are largely confined to your own Door county and across the lake in western Michigan. The plum is not a commercial fruit in this area but we find some commercial plantings in the lake region. Pears are nowhere grown extensively. The small fruits, particularly the strawberry, are found in limited areas in all the states, with carlot shipments largely confined to Missouri, southern Illinois, and southern Indiana. Commercial grape growing is well developed in the Lawton district of Michigan, Wathena, Kansas, and near Council Bluffs and Omaha.

Fruit growers in general are not organized. We find in the thickly planted area of Michigan, associations which are fully successful. The same is true of some of the strawberry regions of Missouri and of the cherry region in Wisconsin.

We thus find that commercial fruit growing is restricted to a few comparatively small areas and scattered single plantings. The great bulk of the fruit produced has in the past been grown in the home orchard and fruit gardens.

Statistics are always dry and census figures especially so, if too often repeated, but to state that this middle western territory has lost practically as many bearing apples trees as were found ten

years ago within the boundaries of the states of Missouri, Iowa, Minnesota, the Dakotas, Kansas and Nebraska, leads us to realize what the mortality has been. The bearing apple trees in 1920 were only about 53 per cent of the number found in 1910. If we add to the 1910 figures those trees which were not then in bearing but which should have been when the 1920 figures were taken, we find the loss has been about 60 per cent. The greatest loss has occurred in the state of Missouri, which shows a decrease of over nine million bearing trees out of approximately fourteen million in 1910. Kansas has lost about five and one-half million trees out of seven million, Iowa three million out of nearly six million and Nebraska two million out of about three million.

Blister canker has thus finished the job of neglect which the farmers of this region practiced from the planting boom days of the eighties and nineties until the end of the period. While other fruits are less important in the area we find a general decrease in productive trees and in about the same ratio, or from 30 to 55 per cent less than in 1910. Small fruits which are shipped from the district in only small quantities are the only class that are holding their own in acreage and production. Production, however, in census years is not a fair index. Production figures must cover long periods before they represent a rise or fall.

During the past five or six years the Bureau of Crop Estimates has separated the commercial crops from the general farm crop, thus we find that only about 44 per cent of the United States farm crop of apples is commercial. Probably a smaller percentage of the other fruits are commercial. (The commercial crop is defined as that part which is sold in the fresh state.) In the middle west the percentage of the total crop which is commercial is much smaller than that in the rest of the country as might be expected where we find a small area devoted to fruit culture. In most states it does not run higher than 30 per cent. However, in the state of Illinois, in a good crop year, as high as 70 per cent of the crop may be commercial.

To return, then, to the question of whether or not fruit growing may prove profitable in the future within the limits of the boundaries of the middle west, let us consider what has caused the decline and what the opportunities for the up-to-date fruit grower may be.

In the early eighties, the farm orchards in this territory, particularly in the western part, were very profitable. Disease and insects were practically unknown and large crops selling at a good price, were the rule. This lead to a planting boom which increased the number of bearing trees in 1900 by many millions. Successive freezes between 1900 and 1910 discouraged fruit growers as did the introduction of some of our more serious orchard pests. Neglect was the rule. As an illustration of what this decline has meant to certain communities, one town with which I am familiar shipped in 1909 and 1911, something over 500 cars of apples. I presume that it would be difficult to get together at the present time five cars of commercially sound fruit in that district. Following the extreme cold weather of the fall of 1909, the disastrous freeze of April, 1910, following warm weather in March and with the extreme drouth of two or three years following, the trees were so weakened that blister canker made rapid headway. I presume that this disease has been more largely responsible for the death of these trees than any one factor, certainly more so than has San Jose Scale. Those orchard men, the real fruit growers, who took care of their orchards in place of neglecting them have been prosperous through all this time. They have not found climate and soil unsuited to fruit growing. This is even true in the northern states, of Minnesota and Wisconsin, where more hardy varieties have been developed by our esteemed friend, Mr. C. G. Patten of Charles City, and more recently by the Iowa Experiment Station under the direction of Professor Beach. No small part of the future apple growing areas in these states will come from the fruit breeding station in Minnesota.

With the loss of the farm orchards a new market has developed for the commercial fruit grower. In my own state of Indiana large numbers of growers are selling their entire output from orchards of ten to fifty acres at their own door without any costs for packages, freight, commissions, or the usual marketing expenses. These men spend a portion of their package charges in advertising. Many different marketing systems have been developed; sales days and the booking of orders are most common. Automobiles and trucks come to these orchards from distances as great as one hundred miles. This, of course, does not apply to the commercial sections which have been listed. It is surprising

to note what a large percentage of the customers in the corn belt are farmers who have failed to produce good apples at home.

In considering the planting of commercial orchards one must consider, first, possible competition for the markets available; second, increased population, and, third, the usual hazards in the production business.

Turning again to census figures we find that the non-bearing trees of our principal fruits have greatly decreased in number since 1910, in fact, there are increases only in New England, along the eastern coast and in California. The state of Washington has lost more non-bearing apple trees than the increase in all of these sections. The younger plantings would not seem to offer any great competition. One of the factors which must be considered is the increased production on the smaller number of trees which still remain. It is true that the total production of apples from 1910 to 1920 was greater than in the preceding decade. This can be accounted for in only one way and that is that the better care given by commercial fruit growers has increased their production per tree sufficiently to take care of all the trees that have been lost. With still better cultural methods can we look for a still further increase in the average production per tree? There can be very little doubt but what this increase will occur, but the population of the United States is increasing at a more rapid rate and we must look for a still further decline in the bearing tree in our farm orchards, although this loss will not be in as great ratio as it was in the past decade.

What has been the commercial production measured in carlot shipments from this middle western territory? Taking the carlot figures on the larger markets for the year 1918 we find that approximately 90 per cent of middle western apples was marketed within the borders of the middle west. We also find that the states of New York and Washington each shipped more fruit into the markets of this territory than was shipped from the middle west. In other words, the middle west can consume all its own commercial crop and must call upon Washington and New York for twice as much more. As a further illustration, the city of Indianapolis received 814 cars of apples in 1918. Of this only 53 cars came from the state of Indiana, while over 300 were shipped from New York.

The last of the factors considered, the hazard in the business of production, is of least importance in the mind of the middle west-

ern fruit grower and probably greatest in importance in the minds of those growers outside the district. We have considered the cause for the death or loss of these fruit plantings. In the regions where these losses occurred are many plantations that indicate that with proper care no fears may be entertained as to the possibility of protecting the trees from the attacks of insects and diseases. The climatic hazards are absolutely out of the control of the fruit grower unless he resorts to the expensive method of orchard heating, which in most cases has not proven profitable over a period of years in this territory. The profits and the success or failure in any business cannot be measured by the income and outgo of a single year, but averages must be taken over a period of years. When this is done fruit growing will show a substantial profit in this territory.

Recent investigators have pointed the way to increased production through better fertilization, more sane methods of pruning and more timely spraying. In those regions where production is sufficiently great to prevent the local or home markets consuming the majority of the fruit, horticultural associations have and will continue to provide markets for all of the first class fruit that can be grown.

In conclusion then, the decline in fruit growing in the middle west has had its causes in orchard pests which have made it possible for the commercial fruit grower to produce fruit at a profit. This decline then means that the future for the commercial fruit grower is brighter than it has been in the past. Those diseases and insects which have ruined these trees have been a blessing in disguise. Some may feel that with the loss of trees the consumer may be forced to pay higher prices for the fruit which he receives from the commercial grower. While in some cases and in some years this will be true, the average will show that the consumer will receive a higher quality, a more economical product at very little, if any, higher price.

The future of fruit growing in the middle west then will be largely confined to the commercial grower who has sufficient foresight to see the opportunities as they are, sufficient interest in the business to give his fruit plantations the best possible care and sufficient business ability to so organize his productive enterprise and his marketing as to make the productive years carry the burdens of the years when no fruit is produced. The most successful

grower will be that one who diversifies his fruit growing and farming practices to the fullest extent possible, considering markets, labor conditions and capital invested.

"The intensive farmer in an extensive farming region is assured of an easy and adequate market." This is indeed the outlook for the fruit grower in the middle west.

SOME WAYS IN WHICH THE DEPARTMENT OF MARKETS AIMS TO HELP FRUIT GROWERS

BY B. B. JONES, *Dept. of Markets*

I am glad indeed to have the pleasure of discussing with the members of the State Horticultural Society a few of the things in which both the Department of Markets and the fruit growers are interested. It might interest you to know that a considerable amount of my knowledge of things horticultural was gained from taking class work under and doing practical orchard work for Professor Beach, who has just spoken to you.

I am glad to note that the program uses the word "Some" in giving the title of my talk. There are a great number of problems in which the fruit grower and the Department of Markets are both vitally interested and so I will confine my remarks mainly to those things of which I have direct charge, namely, the standardization, inspection and the market news projects of the department.

Two years ago when the department started its work one of the first projects to be started was that of standardizing farm products. It is needless to say that at first the work along this line met with considerable opposition. It is sufficient to say at this time, however, that practically all opposition to the principle of grading has subsided and that many of those who first opposed grading are now among the staunchest supporters of the grading work.

The question of standardization of fruits and vegetables is not confined to simply the grading of the product for market but standardizing should be practiced in other lines as well. Growers should standardize on a few standard varieties in each locality. We have too many varieties of our various fruits and vegetables

and as a commercial proposition the less important kinds should be eliminated. Methods of producing fruits in any locality should be standardized by the growers of that locality. When the commodity has been produced the system of preparing for market should be standardized and instead of the produce being prepared in a dozen different ways uniform methods should be practiced. Finally standard grades for determining the size and quality of the stock should be supplemented by the use of standard containers.

The Department of Markets during the past year revised the old apple grades and promulgated grades that have met with general satisfaction. It is unnecessary to go into detail regarding these grades because apple growers in general are well acquainted with them. In addition to apples, standard grades have been established and enforced for potatoes and cabbage. Standard grades for strawberries have been recommended but have not as yet been promulgated and enforced. Grades for other fruits and vegetables are being tentatively drawn up and as soon as found practical they will be promulgated. The department through its standardization program hopes to benefit producers, dealers and consumers. Producers and dealers will be benefited by the building up of a high reputation for Wisconsin products which will mean increased demand and increased prices and will benefit the consumer by letting him know what he is buying and by enabling him to get better quality products and thus increased value for his money.

The inspection work is closely linked with the standardization program as in reality the inspection work is the means by which the grades are enforced. In the case of potatoes the department is enforcing the grade rules through a system of compulsory shipping point inspection. This system consists of inspecting every car of potatoes before it is shipped and issuing an official state certificate showing the grade and condition of the potatoes in the car. In the case of cabbage the grades are enforced through inspectors being placed at shipping points. These inspectors in addition will make inspection on carloads of cabbage and issue an official certificate when called upon to do so by the shipper. The apple inspection work this year consisted largely of educational work in the field. The apple growers of the state have a good idea of what apple grading consists, but due to the fact that the

grades were slightly changed this past year, it was thought best to do further educational work this year before strictly enforcing the grade rules or instituting a compulsory inspection system. It is planned that next year a strict system of inspection will be outlined and that growers not grading and properly marketing their fruit will be prosecuted.

As fast as other grades on fruit and vegetables are established there will be outlined systems of inspection that will enforce the grades as promulgated by the department.

The third line of work that I wish to briefly speak about is that of the market news service of the department. The fruit grower has come to realize that his whole problem is not one of production, but that half of his work is to successfully market his product. It does very little good for a grower to produce a fine lot of fruit if he is unable to find a satisfactory market for it all. In order to market his crop successfully, he must know and understand market conditions and be informed of the daily changes that occur on the terminal markets. He must have figures showing production over the country and a study of all facts available will give him some idea as to the consumption and the probable demand and movement. Much of this necessary information is furnished by the Department of Markets through its market news service program.

At the present time, the department is issuing a daily market report showing market conditions and prices for live stock, dairy products and fruits and vegetables on the large central markets and also giving information as to prices at the larger shipping centers. Since this work has been started there has been a noticeable demand on the part of the producers for this information and in order to expand the service, the department has arranged for the dissemination of this information in ways other than through the daily mail bulletin. Some of the larger growers and dealers desire quicker service than they can obtain through the mail service and for such parties we have established our wireless market reports.

The department has installed in its office a branch of the leased wire circuit of the United States Department of Agriculture and are directly connected with the larger terminal markets extending from Boston to Kansas City. As fast as the market reports come in over this wire they are made available for those who want

them. Every day a market report is written up and dispatched to the Department of Physics of the University who have a powerful radio sending apparatus and who dispatch these market reports, which the department furnishes them, both by wireless telegraph and wireless telephone.

The department has scores of letters from receiving stations in Wisconsin and from stations in the surrounding states of Minnesota, Iowa, and Illinois telling how they are receiving these daily wireless reports and how they are making use of the same. County agents are becoming greatly interested in this wireless work and many of them are planning to install receiving outfits in their offices by which they can receive these daily market reports and furnish this information to those producers who desire it. One of the advanced ways in which the information is to be distributed is being outlined by the Waupaca Association of Commerce. They are installing a large receiving outfit and each day intend to furnish to the local telephone company the market reports that the Department of Markets sends out. The telephone company is to give a general ring to all its subscribers and to read over all of its lines these market reports. Such a system of distribution can be made very effective and bring the farmers in direct contact with the market. Compare this quick service with the service that was in vogue ten years ago or say even three years ago. Producers, as a rule, have not been conversant with the market condition in the terminal markets but under this system they can be brought in direct contact and understand just what is going on at the places where their products are being sold. It places them in a position to know and to take advantage of any upward tendency of the market.

The daily mail bulletins are sent out free of charge to any one making application for them and if any of the members of the Horticultural Society are interested in receiving these bulletins, you can leave your name in the office of the Department of Markets in this building, and you will be placed on the regular mailing list.

If you are interested in installing a wireless outfit, we would be glad to have you call at the office and discuss the matter with the men in charge of the radio work. Small receiving outfits for home use at a short distance from Madison can be purchased for around $40.00 but where the distance from Madison exceeds 75

to 100 miles, it is necessary to expend the sum of $75.00 to $150.00 for a good receiving outfit.

As I stated previously there are many other things that the department is doing in which the producers of the state are more or less concerned, and time will not permit my going into detail on all the various projects of the department. You might be interested, however, in knowing of the project for assisting producers in selling their crop or in buying supplies that they may need. For instance, if a fruit grower has a carload of apples for sale and does not know just where he can market it to the best advantage, he can call upon the department who is in touch with all the markets and no doubt would be able to find a purchaser for the car. If, on the other hand, a local farmers' shipping association would like to ship in a car of apples, peaches or other fruits or vegetables, they can call upon the department, who will be in a position to put them in touch with someone having such products to sell.

Another feature of the department's activities is that of suppressing unfair practices in competition. Some unfair practices spring up in the distribution of food products and the department is working at all times to suppress these unfair practices and to prosecute violators of the law. At any time that you think you have just cause for complaint along this line, the department will be glad to have you report the case to them.

There are a few fruit growers' organizations in the state that might be interested in the department's work along accounting methods. Accounting systems for shipping associations have been outlined by an expert accountant of the department and he is glad at all times to advise with any shipping association and to install this uniform accounting system when called upon to do so. A request for such service addressed to the Department of Markets will receive immediate attention.

Fruit growers having transportation problems can secure assistance from the transportation project of the department. The bonding of warehouses is another activity of the department and this phase of the marketing work should be studied by those interested in holding their product in storage for some time and make it possible to secure loans on warehouse receipts. For those who are interested in co-operative marketing I will say that the department strongly backs such activities and is glad to give assistance

in the formation of cooperative associations. In closing I would like to emphasize that the department is deeply interested in marketing problems, especially those of the producer, and every one should feel free to call upon the department for assistance in marketing work.

HAS THE FRUIT GROWER ANY RIGHTS THAT THE NURSERYMAN IS BOUND TO RESPECT? AND VICE VERSA

LLOYD C. STARK, Louisiana, Missouri.

Being equally interested in orchard and nursery, financially, enables me to speak with freedom from bias that one not similarly situated could hardly feel. I have an interest in a nursery and I personally own and operate an orchard of 100 acres.

First, I am going to talk as an orchardist, and I am going to tell you what I want when I get ready to plant out my orchard. Now, as to whether, the nurseryman is bound to respect my wishes or my rights or what you may call them, as an orchardist, I can't answer, because the nurseryman, like any other citizen is only *bound* to respect the rights of the orchardist as set forth in the statutes—but if he is a good nurseryman, and if he wants to stay in the nursery business for the rest of his life, he is not only bound to respect my reasonable wishes as an orchardist, but he is mighty anxious to do so, and if he can't quite come up to the specifications and requirements as set forth by me, as an orchardist, he is at least going to lie awake nights making plans and "doping" out ways and means to come as near as possible to measuring up to my expectations.

Now then—let's get down to brass tacks. I am going to plant an orchard. I have bought my land and I know it is good orchard land. I have paid probably $150.00 an acre for it. Maybe more or less, but I know it is good orchard land or I wouldn't be planting it to orchard. Now then, my trees are going to cost me a good bunch of cold cash—say they cost me 30c each. I have decided to plant them so it will require about 39 permanent trees and 39 fillers to each acre. That is $23.40 per acre for my trees.

The worst horror I have is that when my trees come into bearing they are not going to be true to name. That would be awful

if the varieties I have so carefully selected, turn out to be something else. That is *Specification No. 1.* I don't want to get my trees from any nursery that has a reputation of being either rascally or careless. I want to get my trees from the firm that I think tries hardest to keep all their varieties true and un-mixed, and if a nurseryman hasn't got what I want I want him to come right out and say so, so I can get them some place else or plant trees of one or two other varieties that I would just about as soon have.

Of course, if I were a doctor or a business man in some other line and didn't know anything about the nursery business, I would be pretty likely to ask Mr. Reliable Nurseryman what he thought would be best for my soil and climate, and I think I would take his advice if I had enough confidence in him to buy his trees.

Now then—we come to *Specification No. 2.* If Mr. Nurseryman can't furnish the trees ordered, it is up to him to let the orchardist know so he can buy elsewhere, or buy some variety which Mr. Nurseryman can furnish. Now we have our varieties all straightened out; the trees have been shipped but haven't arrived yet.

Right here is *Specification No. 3*—It is something no man under the sun can answer with absolute certainly. *Are my trees full of life?* Have they every bit of that 100 per cent vitality that they had last fall when they were growing in the nursery so beautifully? Right here lies the secret of many an orchard failure and the loss of thousands of dollars—not only to the orchardist, but to the nurseryman, and aside from correctly labelled trees, to my mind, this is the most important of all the requirements I make of the nurseryman—*Get your trees to my freight station just as full of vitality as they were before they came out of the ground.* To do this Mr. Nurseryman must dig his trees right. He must dig them with some sort of a power digger that will get down deep and dig wide—something that will get all the roots, the tiny fibrous roots as well as the spreading laterals and tap roots, because I want to plant my trees in a hole 20x20x20, and I want my trees to fill that hole; and, YES—I want to have to cut a few roots to get them in that hole.

So here is *Specification No. 4*—I want my trees dug with all the roots.

Specification No. 5—I want my trees handled without exposure, from the time they are pulled out of the ground until they go into

the shipping box or bale. To do this for me, the nurseryman has got to use some head work, some common sense, a lot of good tarpaulins, and has got to build some nice, cool, dark grading houses. In other words, as soon as the big digger blade goes under my trees, I want a gang of husky, well-trained men following close behind, with never more than a few hours between the passing of the digger and the lifting of the trees. Right behind this pulling gang I want a line of covered wagons, and I want my trees to go right out of the ground into these covered wagons, and I don't want them to come out of that covered wagon until they are inside a cool, damp packing or grading house, where the wind and sun cannot brown the tiny little tendrils of the fibrous roots—the little fellows that start to grow first and really are the feeders, the lungs for the larger roots.

Now, I know—and I know all of you here know—that a tree may have these little roots badly injured and still finally pull through and grow nicely and make a fine tree, but that tree has got to go through a spell of sickness, so to speak, and get well again before it makes that fine big orchard tree. Maybe some of my pigs will get sick, and get well again and grow out of it, but I would a lot rather have one that started growing from the day it was born and never had a check until he went to market. It is the same with transplanting a tree. Mr. Nurseryman can preserve all the wonderful vitality of that root system, or a big part of it, but a little carelessness, a little exposure to sunshine, hot wind or cold wind, or simply handling uncovered in the field without any wind at all, will take away a big part of the vitality so badly needed by the tree to stand the shock of transplanting.

Just to show you what I mean, to give you a specific example—not long ago I planted in one of our more recent orchards about 8,000 trees. I was on the job as much as possible—or at least as often as possible, and saw to it that holes were dug right and trees were planted right. Especially I saw to it that there was no exposure of roots. The trees came right out of the trenches where they were heeled in, carefully hauled in and each bunch planted within a few minutes from the time it left the ground. Out of this batch of 8,000 trees, from all causes, we had practically no loss—about 80 or 90 trees, and most of these were killed by the locusts we had that year.

These dead trees I replanted in the following spring. That is—a year after the first ones were planted. All conditions about the same, same kind of trees used in planting, except it came at a time when I was very busy and could not be out there when they attended to this job, nor could I send one of my experienced men. After this bunch of trees had been planted I learned that the two youngsters who did the planting had carried these trees all over that orchard—up and down one row and on to the next, etc., sashaying back and forth across the orchard. Some of these trees had been exposed half a day or maybe all day—perhaps parts of two days. Weather not particularly bad, but chilly and windy. The sun was shining and once or twice it got down pretty close to freezing. Anyway, the roots of those trees were exposed a lot more than it was good for them to be exposed—and what was the result? They had just the same chance as the other 8,000 trees. Yet, about two-thirds of those 90 trees failed to live and I wasn't a bit surprised after I heard how the boys handled them—I knew they weren't going to live, and I wasn't surprised. Those that did live, although they made fairly good growth, didn't make anything like the growth they would have made if they had come in without exposure.

And this is the part of the nurseryman's job where he most often fails and most likely he doesn't know he is failing. Maybe he thinks his customers are unreasonable, unfair and a bunch of kickers—and there may be some orchardists who are like that, but most of them are pretty reasonable chaps. Most of them are honest, but like all other professions there are some crooked orchardists, just like there are some crooked nurserymen.

So much for specification No. 5, wherein I require the nurseryman to handle his trees with all possible care so that he is going to get them to me 100 per cent full of "pep" in the roots—uninjured roots and well matured, well ripened tops not dug until all the sap has "gone down."

Specification No. 6—Mr. Nurseryman must give just as much thought to packing my trees for shipment as he does to keeping them straight in the nursery and digging them right after he grows them. If I have a large order, I want it to come in double paper lined boxes, closely packed with wet fiber and moss around the roots, so that there will be no air pockets. I want them packed just as tight as they can be without breaking the roots or branches,

for if they are packed right, a little delay, a little freezing won't make any difference, provided I don't open the frozen trees until I have thawed them out in some damp, cold cellar or similar place. If I have a small order, and my trees are shipped by express, I want them baled and baled right. I want this same wet packing material and plenty of it put around the roots, and I want them wrapped in good, strong, air-tight paper, with the tops entirely covered with a good coating of rye straw, or other similar material, and I want the roots tightly sewed up in burlap.

Any nurseryman that sends me trees reduced in vitality by careless handling at digging time, or through careless packing, is not respecting my moral rights as his customer and an orchardist, but he is following practices that sooner or later will wreck his business as well as injure the bank accounts of his orchardist customers.

My shipment of trees has arrived at the railroad station. I have paid the freight bill and loaded them in my wagon. If Mr. Nurseryman has lived up to my specifications, his job is done.

Now, it is up to me as an orchardist to keep my part of the transaction. The first thing I want to do is to make sure that I don't forget to pay for my trees, keeping Friend Nurseryman waiting for his money for three years when he may need some of it to carry along his business of growing and handling the trees the way the orchardist wants him to handle them.

I have paid my bill then, and the trees have been opened up. I have looked them over. They are fine—nice, big healthy roots, just fresh as they came out of the earth, moist and plenty of them. The tops are good, too—nice, well-formed trees, nicely branched two year, or nice, big, fat one year whips, full of big, fat, ready-to-grow buds. It is a sure thing if these trees don't grow it is my fault now—not the nurseryman's. If any of these trees die and I kick, I am a piker, and I know it—so I am going to see to it that they don't die.

First, I am going to see that those holes are dug right, plenty large enough. I will see that the trees are not exposed to wind, sun or freezing during the planting operation, because the roots can be easily injured, causing the tree to die, or make a very poor growth. The men doing the planting will do a good careful job—plenty of good top soil worked in round the roots and tramped in solid because air pockets around the roots are bad.

If trees are planted in the spring, the trees will be pruned soon after planting or at latest when they first show signs of the buds growing. During the first season, the trees will be frequently cultivated, especially early in the summer, because that is when they will make most of their growth. I will not allow weeds to grow up and choke the trees and then blame the nurseryman because the trees didn't grow.

Many a "kick" has been made to the nurseryman when investigation would show that it was a case of gross neglect on the part of the orchardist. If the orchardist had a corn field, he wouldn't fail to cultivate it, because he knows he wouldn't get any corn—but that same man will often let his trees go without any cultivation or care and then raise "Cain" because the trees didn't grow.

That reminds me of a friend of mine who lives in a Chicago suburb. During the war he got the "War Garden Fever" and bought a lot of fine vegetable seed, planted it out and then watched the result. "If the vegetables beat the weeds, they are all right. If the weeds win, the seed is bum."

I am glad to say that the up-to-date farmers and orchardists are rapidly learning that it pays to cultivate and care for their trees just the same as it does corn or any other crop.

Another right of the nurseryman that the orchardist should respect—(but some of them don't),is this—"Live and let live." Be willing to let the nurseryman make a fair profit on his trees. When any business stops making a profit, they either must cut the quality of the product or go "broke." The nurseryman doesn't want to go "broke," although a lot of them do. Don't try to beat the price down below the cost of production. A cheap "bargain price" tree may be mighty expensive in the end—and it is the orchardist who suffers. By being willing to pay a fair price for his trees the orchardist is much surer of getting his full money's worth.

There are many more rights of the nurseryman that I could mention, but I believe three words will express it—"The Golden Rule." You will find most nurserymen anxious to *permanently* please you for they are looking for your future business. Treat him right and I think he will do his utmost to give the orchardist a square deal.

WEDNESDAY EVENING

The program was furnished by The Women's Auxiliary, Mrs. N. A. Rasmussen presiding. The following papers were read:

MY FEATHERED FRIENDS

MRS. E. L. ROLOFF

Give you "A little talk on 'My Feathered Friends?'" Thank you! I'd be very glad to.

Perhaps I can best tell you about my bird neighbors by inviting you all to come with me on a little imaginary ramble through my garden and immediate vicinity to get a glimpse of some of our birds as I see them throughout the year at my home.

According to classification we have winter birds, summer birds, migratory birds that pass on farther north in the springtime and return again in the fall for the southland; and several species who are permanent residents. These different classes are again subdivided into, land or song birds, water birds, shore or wading birds, game birds and birds of prey. True, we receive visits from many species of each of these different classes in their respective seasons. Yet, it is the birds belonging to the family of land and song birds—those who come from the southland every springtime to home and nest with us—and remain all summer—that are nearest and dearest to us.

The first one to come is the beautiful bluebird; he arrives on the first pleasant day after the first of March, and, Oh! the good cheer that comes with his arrival is like an announcement that spring is come; usually on the same day that I see the first bluebird I also pick the first pussy willows. A pair of bluebirds always nest and rear their family in a bird house in an apple tree in our garden. Last summer a second pair was persistent in wanting to build in a bird house close by our home, but a triangle fight ensued between bluebird, flicker and English sparrow lasting a month, when the bluebird, disgusted, went elsewhere; flicker and sparrow also left, leaving the house vacant for the season.

The robin is a close second to the bluebird, arriving several days later; then follow the song sparrow, meadow lark, kildeer, and by the end of the month the phoebe, mourning dove and the flicker. All build close by. One pair of robins always build on a beam of our pergola, and Mrs. Phoebe never fails to build her nest

on a little shelf under the roof of our porch, just beside the living room window, where she seems to enjoy our presence and interest, for, if she did not, would she come again the next season? She raises two broods in the same nest. The song sparrow builds her nest on the ground, under a tuft of grass, or a tiny shrub—the strawberry patch is a favorite place.

The next birds to arrive that are of greater interest are the purple martins (about the tenth of April), who that has ever "owned" a colony of happy and congenial martins that does not love them? Is not their reputation of "eating at least two thousand mosquitoes a day" alone worth their weight in gold? When we watch them bringing in the yellow cabbage butterflies to feed to their young the thought comes to us that "Oh! If we only had more martins, perhaps the cabbage worm would become extinct.

Shortly after the martins come the little chatterboxes—the house wrens. We have small houses and boxes placed in every nook and corner, so as to induce as many pairs as can agree with each other to build their nests, for the wren stands side by side with the phoebe on the upper rung of the ladder of beneficial qualities—living wholly upon insects of injurious and noxious kinds. The phoebe catches her prey on the wing—the wren secures hers more from secluded hiding places.

Occasionally the question is asked me as to which gives me the most pleasure, my flower garden or my bird family? My answer is always, "both," for to me they sort of belong together, for in many instances, either adds greatly to the beauty and attraction of the other. The blossoms alone on the syringa and spirea van houti bushes by our gate would not be nearly so attractive if Mrs. Catbird did not build her nest in them every summer—one year in the syringa—the next in the spirea; and Mr. Catbird the while perched upon the arbor over the gate pours out his beautiful variations of improvised song or, catmew scoldings to unwelcome intruders, as the case may be.

The beauty of my perennial border is greatly enhanced by the presence of the little ruby-throated humming bird, who always arrives early, about the middle of May, the beginning of the blooming period of the Aquilegia Canadensis, or, wild columbine—the nectar of which he is especially fond. He remains with us all summer, flitting and humming from flower to flower, all day long,

gathering the nectar and tiny insects for his daily food. . Two special favorites after the Columbine are the Monarda Dydima and the Impatiens biflora, or jewel weed—both native flowers of Wisconsin and both growing in my garden. Mrs. Hummingbird has built her nest and raised her family of two in our yard for many years.

Lilac and currant bushes in the farther end of the yard are favorite nesting sites for the yellow warbler and chipping sparrow, both become quite tame after making your acquaintance.

My ill-feeling toward the hordes of dandelions that have planted themselves promiscuously on the lawn, is considerably alleviated by the fact that their seeds furnish food to the flocks of our beautiful gold-finches, with an occasional Indigo bunting for color scheme, who congregate and feast upon them all day long.

Close by my kitchen door and window, we have a large boxelder tree, which, I suppose, if I could behold through the eyes of a true horticulturist, would long ago have met its fate at the chopping block of a firewood pile, but as I profess to be only a play horticulturist, this boxelder tree has become one of my favorite trees in the entire yard, because of the attraction it holds for the birds throughout the year. In the summertime at least two bird families nest in it, a yellow warbler and perhaps a Baltimore oriole, robin or catbird. In the wintertime the myriads of seed pods furnish food for some of our winter visitants—the evening grosbeaks and purple finches. To see a flock of a dozen or more of the handsomely colored grosbeaks feeding on these seeds for a half hour or more at a time in snowy midwinter, is truly a pleasing sight.

About the tenth of May marks the time of the beginning of the most exciting and busiest ten days in bird life of the entire season. It is the time of the coming of the Vireos, thrushes, flycatchers, swallows, and the migrations of the great American warbler family from the south to the northland. Hundreds of the little beautifully colored birds—all colors and markings—feeding, flitting and warbling as they go from branch to branch, and bush to bush, forward and onward; several varieties are ground warblers, feeding low; others higher on bushes and some prefer the tree tops. Only a few species remain in this vicinity to build, others go as far as Canada, and one—the black poll warbler—is said to go as far as Alaska to nest.

May and June are the two months that we enjoy wonderful bird songs and choruses. Most birds are settled and nesting then, and are in full song. The chorus beginning at day-break, with the robin usually as the leader, and in a few moments we can identify twenty-five or more individual songs. The most beautiful among them is that of the wood thrush. To me, a solo sung by the wood thrush from a fence post at eventide, when all nature is quiet and at peace, is one of the most beautiful things that I have ever heard.

There is much more to be said about our bird friends, new things to learn and enjoy from year to year, but we must hurry on. With the coming of autumn and the passing of our summer birds to the southland, we must get the suet tree and feeding station ready for the winter birds—many of them arriving before the summer birds are all gone—the little chickadees, nuthatches, hairy and downy woodpeckers and brown creepers—all suet eaters. Then, if the snowfall is very heavy, covering all weed seeds, we must put out crumbs and birdseed or small grain for our weed seed eaters—Juncos, tree sparrows, red polls, all beneficial birds. A few apples left on the trees in addition to the seeds or berries on asparagus vines and native shrubs, are appreciated by our winter visitants, the Bohemian waxwings and cedar waxwings. And so, on and on, until March 1, when we again begin to look and listen for the beautiful bluebird and his love call.

THE DECORATIVE POSSIBILITIES OF THE DAHLIA

MRS. J. T. FITCHETT.

In his address before the American Dahlia Society, President Richard Vincent, Jr., thanked an all-wise Providence for the wisdom and ability given to produce such an exhibition as was made at the annual dahlia show in New York City last September. We have his word for it that there was brought together at that time as charming a lot of wonderful flowers as ever mortal eyes looked upon. He had an ambition that is also mine; to make you see the loveliness of this flower to such an extent that you will wish to join our happy dahlia family, feeling that life is not quite worth while and that our gardens are quite incomplete, without at least a few choice specimens growing in them.

You were told this morning that there is no flower that grows that has the variety of form and color that the dahlia has. There are few places indeed, where flowers are used, that cannot be filled by this versatile member of the family. All the grace and simple beauty of the cosmos and daisy are embodied in a bunch of single dahlias. Some of the white peony flowers and cactus dahlias show a stateliness and purity that the far-famed lily cannot rival. The saucy collarettes show a velvety piquancy that the pansy never equalled, to say nothing of the advantage of having a stem and size. The exquisitely colored, softly curling petals of the peony dahlias, from a flower of rarest beauty, with shadings more alluring than any rose, while the stiff, perfect form of the show dahlia still go to make up the acme of beauty for many flower lovers. More wonderful than all of these are the great chrysanthemum-like flowers of the cactus type, with their petals variously rounded, pointed, flat or curving, rolled tubular-wise or turned in, some shaggy and some almost regular, many of them seven or eight inches in diameter.

As for color, a dahlia garden shows a perfect riot. With every possible color excepting the blues, we have shadings that rival anything that Turner ever put upon canvas. Primrose yellow shading to violet rose; sulphury white suffused with lilac; rich, deep scarlets, royal purples, canary yellows shaded with pink; velvety maroons, golden salmon, rich apricots, coral reds, old rose and delicate lavender, all are found in this gorgeous flower, together with every tint of autumn glory. And these are only a few of the colorings and combinations obtainable.

No home or hall, club house or church is so spacious that the dahlia cannot fill it. No sick room or table so small or poor that this flower will not cheer it. No banquet table so beautifully appointed that the dahlia will not grace it, and no color scheme so unique or unusual that there cannot be found dahlias to harmonize with it.

We have proven the above statements, many times. One of the most effective decorations, and one very largely commented upon, was used this fall in a local church, seating 1,200, on the occasion of the opening after redecorating. The woodwork and walls were a lovely soft brown, with mellow, softly colored lights. On that day, the only decoration used was a single basket of the King of the Autumn and George Walters dahlias, with stems four and

five feet high. Nothing could have been more gorgeous and effective.

One of our club houses has ivory walls and old blue hangings. For one party the flowers used were the old rose and buff dahlia, called Wodan. Many thought that nothing could have been more beautiful, but when, at another time, the flowers used were of the autumn yellows and bronzes of King of the Autumn, Duchess of Brunswick and Frau Geheimrat Scheiff, they were not quite so sure. At this particular party a basket containing but four perfect blossoms set off by beautiful foilage, attracted universal attention and admiration.

Much could be said of the beauty of baskets filled with this flower. The cactus dahlia seems to be particularly well adapted for this use, although not by any means to the exclusion of the other types. But a basket filled with yellow cactus dahlias, ranging from palest straw color to tawny orange, with perhaps one or two deep, velvety maroons to set them off, leaves nothing to be desired in the way of beauty.

Combinations of this kind, and uses to which the dahlia may be put, are limited only by your garden space. If you are cramped for room, plant fewer potatoes, letting "George raise them," and give yourself the pleasure of going out into the garden and picking real armsful of lovely flowers whenever you wish or whenever occasion demands them. Your garden then will give you an unlimited vocabulary to "say it with flowers." And let us not forget to "say it," for I think we all feel as did Francis Murphy, who used to say that he would rather have a little girl give him a bit of a nosegay while he was living than have a big Irishman dump a whole wheelbarrow load of flowers on his grave and say, "There, Murphy smell of thim." So say it to your friends and relatives, to the bride, the young mother, to the shut-in, the bereaved, the sick and the well, the joyous and the wretched, the rich and the poor. It will give happiness to each one and you can find an individual dahlia for every taste and temper. A boquet of mixed dahlias will often do more good in a sick room than the doctor's morning visit. The study and interest in the different flowers so taking the mind of the patient off himself that nature has a chance to get in her healing work. Physicians have prescribed regular visits to our gardens as a part of the cure for nervous patients.

So long as the human heart goes out in sympathy when loved ones are gone, just so long will flowers be the silent messengers

bearing that sympathy. And for funeral work, dahlias are rapidly coming to the fore, proving their adaptability here perhaps more than in any other place. The soft shades of rose or flesh pink or delicate lavender, blended with the white of Queen Wilhelmina or Giant Edelweiss, can be used most appropriately and with charming results, while many of the richer, deeper colorings make sprays and designs of unsurpassed beauty.

There is much that I have left unsaid that I might have said. Like the far-famed brook, I could go on forever, but I wont, but will let the flowers speak for themselves in the pictures that will now be thrown on the screen.

THE TRIALS OF A FRUIT GROWER'S WIFE

MRS. A. K. BASSETT.

It may sound very romantic to one who reads about renovating an old orchard; clearing land from brush, stumps, and stones; raising nursery stock which the deer nearly eat up; and finally reaping a bountiful harvest which gains attention, and fame throughout the state. But to one who gave up a good position in the city to conform life to this primitive sort of horticulture it was not so romantic.

My years spent in the city schools and later teaching there had weaned me away from the country. Even the short time I taught in the country school I had little or no interest in cows, pigs, chickens, apples, onions or berries. But the birds, flowers and children were my delight.

My fondest memory is an old orchard by the roadside where I passed every morning on my way to school. Of course if we had such trees in our orchard today they would get the ax right away. But that dear old orchard with its brushy tops, hollow trunks, and dead trees, was the most wonderful place to me. Here the woodpeckers hammered and laughed. The brown thrashers, bluebirds and robins chirped and sang. The vireos, orioles, and warblers were there in full force. Even the butcher birds built their nests and hung their mice on the thorn bushes near by. There was shelter, food and contentment for all. I just loved that old orchard but the fruit it should bear never concerned me in the least.

When I came to live on the "Old Weidenkopf Farm" as it was then called, there were any number of these old bird-house trees. But Mr. Bassett declared war on them all and cut them down without mercy. The dooryard was full of old transcendent crab trees, adorned with blight and scale, and I don't know how many kinds of worms and bugs. Well, they all went into the bonfire the first summer. In the orchard there was so much underbrush and so many dead trees that when the first pruning was over with we had enough firewood to last us two years.

The premises were surrounded by what seemed to me the "Forest primeval." Here the hoot owls and mourning doves sent forth their weird calls and filled me with horrors of wolves and wild cats. Brush heaps and stone piles adorned the fence corners, and served as hiding places for woodchuck, rabbit, and skunks. The cleaning up process went on and things began to look better, but as the end of the months came I sadly missed the pink checks.

Besides the farm conditions, the old dilapidated buildings were so distracting. There wasn't a shack among them that would keep out a skunk or a rat. The first summer I kept six hens in one of them and one day when I went to feed them, they were cackling something terrible. I peeked through a loop-hole and saw a rattlesnake making its way out at the opposite side. Every summer I lived in dread of these horrid creatures. They used to come round the spring, which is near the house. Since the woods have been cut down they have taken up their abode elsewhere.

I took a terrible revenge on the last bold one that came near. It was wash day; Arthur, Jr., was bringing some water, when he dropped his pail and jumped upon the porch yelling "snake." Sure enough a big rattler coiled beside the house, right under the kitchen window. How it did rattle and spit. My first impulse was to scream as usual, but I could not do that in front of my three children. I felt I must kill it and not let it get away. I quickly filled a pail with hot suds and opened the kitchen window. I gave Josephine, then nine years old, orders to empty the water out of the window, as I went outside to see what would happen. The hot water came down with a splash. Mr. Snake uncoiled and I struck him across the back. I assure you there was great hilarity as we tied a rope around his neck and hung him to the limb of a sour apple tree. That was the last rattler seen on Ski-Hi. I am sure they are hoo-dooed forever.

Besides being out of tune with my early surroundings, I was not a lover of domestic animals. I wouldn't dare gather eggs if a biddy was on the nest. She might peck me. And a clucky hen could scare me out of the coop. If a strange dog came around the place I wouldn't dare leave the house. If a cow or horse looked at me I would run for the fence. One day I went through the pasture with the children, suddenly the cattle came our way. I grabbed a club and made for safety, but my boy, who was only five, refused to run, saying, "Oh, Mom, don't get scared, you will never be a man if you're afraid of cows."

How many times I wished I had learned to handle a gun, but in all my gymnastic training we only learned to swing Indian clubs and point a kind of broom handle in the air. Many a time a hawk has picked up a chicken in front of my nose, or sat on the nearest tree making faces at me.

Many a time when the men were off in the orchard have I been pestered by some black haired peddler, or insulting picture agent. My wits got rid of one in a hurry. I was alone with the children and heard over the telephone that some hard looking peddlers were on the way. I pulled down the shades. Soon a covered rig drove in and an ugly stranger was knocking at the door. I opened it slightly saying, "We have scarlet fever here." He threw up both hands and cried, "Mein Gott, Mein Gott," and ran screaming to his rig. They whipped up their horses and how they did make the dust fly. After living on the farm I soon found that if we were going to raise fruit, instead of cows and pigs like the rest around us did, we would have to make good before we could expect to hold a place in the neighborhood. One neighbor who had dined too freely with John Barleycorn stopped to see us and spoke out his mind. He said in part, "You haf no grain, no crops, no cows, no pigs, no nothings. I don see how you make a lifing." "But," he added, "You haf got a fine baby, I can say dat for you."

I have thought often of the drunkard's remark. He sure was right about the baby and he had given us a greater compliment than he knew, for are not our children the greatest proof of our success? I would rather have it said that I brought up some fine children than to be the wealthiest cattle raiser or fruit grower in the country.

In due time the Ski-Hi Fruit Farm began to draw the attention of horticultural experts and progressive fruit growers. They

were always welcome visitors, as they left us with words of encouragement and good suggestions for improvement. But there was also another class that came, whom it was my lot to deal with. Curiosity seekers, time killers, and agents were often daily callers. Wasting my time and often leaving a sting. Among the first to come and look around were summer-resorters from Devil's Lake. They had plenty of time and needing exercise, came walking in groups, crowds and small droves. I got so I just dreaded to see them come. I remember one afternoon a dignified lady same along with her Chicago guests. They were all very much interested in fruit as they had invested money in a western orchard, which they had never seen, but from which they expected soon to get big returns. After we had been over the eighty acres, and they had eaten all they could and "bit" into as many more, and bought 15c worth to take back with them, they bade me goodbye. One Chicago lady thanked me very kindly for my time, at which the hostess of the party turned and said, "I presume you see people so seldom, that it is a pleasure to have someone come and use your time." Pleasure or no pleasure I have learned to "size up" these time killers and very courteously make short work of them.

The agents are usually the hardest to shake, but I have some excellent remedies for walking them on. I remember the first scholarly agent who came along. So handsome, so brilliant, and had such important business with Mr. Bassett. Well I hunted over orchard and dale, not finding him. My caller said he would impart his business to me. And getting out some magazines from an inside pocket asked, "Have you ever heard of LaFollette's Magazine?" Had he asked if I had ever heard of Columbus discovering America I would not have been more crestfallen. I gave him a look of thirty degrees below zero and went to the house to find my dinner burning. But I never burned another dinner for any agent.

Jingle, Jingle, Jingle, Santa Claus is coming. Oh, no, he is not; that is only the fruit growers' telephone ringing from early morning till late at night. And of course you must answer every call, for some are really very important. When the phone rings one doesn't know if it is going to be a hurry up call for a shipment of apples or some fusser trying to find out where she can buy crabs a penny cheaper.

I remember one madame who had ordered two pecks of apples. Well, she found occasion to ring up every day for a week concerning that order. The last time she called I was hurrying breakfast. "Good morning, Mrs. Basset, this is Mrs. Porter again, isn't the telephone a great convenience?"

"Yes, and sometimes it's a great nuisance," slipped from my tongue. The deed was done, another customer lost.

If we could afford it, I would keep a girl with a sugar coated tongue to answer all calls. As it is the telephone is my greatest bugaboo. All other problems have been solved. Even my pecky, clucky hens have become my best friends, and my two hundred brownies are our pride and delight, as they keep the egg basket and pocketbook full. The old buildings, like Cinderella's rags, have turned into better ones. The little apple trees as well as the children are becoming very promising.

After the dark, the daylight, and so I found that by falling in line with my surroundings and the determination to succeed, I learned to

Name apples, pick apples,
Cook apples, can apples.
Keep apples, sort apples,
Pack apples, grade apples,
Show apples, judge apples.
Sing apples and sell apples.

WHAT HORTICULTURE MEANS TO THE HOME

ANNA A. IHRIG.

There are two kinds of homes. The home which is equipped with a garden and the home that is not so equipped. To the latter home horticulture, as an art, means very little. However, the homemaker, according to her means, may purchase in her local market the produce from the gardens of the world. Her morning cup of coffee or her afternoon cup of fragrant tea, she takes as a matter of course and blames no one but her grocer if they are not up to their usual standard. To this same grocer she looks for her sugar and spice, her oranges, lemons, grape-fruit, pineapple and bananas, her raisins and dates and figs and other dried and canned fruits and vegetables, with scarcely a thought

for the many far away gardens from which they were gathered or the vast army of gardeners who have produced these articles and by their skill and industry have brought them to their present state of perfection. If she desires fresh home grown fruits or vegetables she orders them, also, from her accommodating grocer or her favorite market gardener. Her florist is glad to advise her in regard to what she desires in his line and sell to her his choicest plants and flowers. The ability to procure these horticultural products means much to the home-maker and to each inmate of the home.

Twenty years ago Irving Smith said the time to sell vegetables is when people want to buy and the way to sell vegetables is to make them so attractive that the people want to buy whenever they see them. This rule holds good today but our marketing commission is striving to make it still easier for the grower and the housewife so that all she needs to do is to order Wisconsin Fancy to be assured of the very best.

Homes, like people, all conform to a general pattern, but no two are alike. Each is an individual problem in itself and the wise man or woman makes generous use of horticultural products to ensure the health, comfort and happiness of the members of his or her family. The Wisconsin home that is equipped with a garden has all these advantages and in addition it has the garden itself. A garden, a name to conjure by. No matter about the size of it or what it may contain it is yours. You feel the joy of possession and at once take a different attitude toward all gardens and your whole family is affected in the same manner. Even before it is a reality, as soon as the decision is reached that your home is to include a garden the coming season you begin to plan for it. You talk garden and read about gardens. Consult garden authorities and seed catalogues and people regardless of who or what they are. Any man can talk gardening to you. If he never had a garden he will tell you about some garden that has influenced his life. It may be his mother's garden, or some garden connected with his childhood, and he will wax eloquent in describing it and the appetizing or healthful things that grew in it. He may never have made a garden but he knows that he could and very likely will get the fever from you and proceed to show you.

Those who have had real gardens are never loath to talk about them and even the most experienced gardeners are willing to tell

you of their methods and advise you when you are in doubt. You seldom are in doubt. You have faith in yourself, in your seeds and slips and cuttings, your soil and location, and are sure the thing you have planted will yield a rich harvest. If it should prove a failure you know just exactly why or you will not rest until you do know and then you will go at it again sure of the best results the next time.

The children love the garden and often it furnishes the means of teaching them habits of industry and responsibility. They do not lose interest in it as they grow older but from the age of ten to twenty their interest is not so apparent as it is crowded out by many other influences.

They will always, however, be ready to use the choicest flowers for personal adornment or to gain favor with their young friends. As they grow older their love for the garden returns by fits and starts and when old age finally overtakes them it is a great solace to be able to putter around in the garden. The garden is invaluable to the housewife in that it affords her a breath of fresh air and a view of growing things which breaks the monotony of cooking three meals a day and cleaning up the debris. It also helps to solve that eternal problem of what shall we eat. Where possible all Wisconsin homes should be provided with sufficient garden space to furnish the home with the common fruits and vegetables grown in this region. The season begins with the first rhubarb pie. Rhubarb thrives in all parts of Wisconsin and should be found in every home garden. If there is no back yard garden it may safely be placed on the lawn either as a single ornamental plant or in groups against a background of shrubbery. It delights in a rich, cool, moist soil and absolutely refuses to grow in a hot climate. In the Wisconsin garden rhubarb is closely followed by asparagus and the early vegetables: winter onions, radish, lettuce, and spinach. Seed onions, green peas, string beans, cucumbers, beets, carrots, cabbage, strawberries, raspberries, blackberries, currants, gooseberries, cherries, early apples, tomatoes, green corn, squash, melon and the various late or so-called winter vegetables.

The home garden is valuable because it furnishes all these and furnishes them in perfect condition, fresh and full-flavored; not to be compared with the same article which has deteriorated on its way to market and from the market to the home.

The home garden should also yield to you flowers. Flowers for every need. First for your own pleasure in the garden and in the house. Cut-flowers for the school or the church, for your friends and neighbors, to express your pleasure if they rejoice and your sympathy when they are sorrowful. Flowers for the children, the aged, the sick or afflicted or those who are shut in for any reason. These are easily supplied by planting some of the old stand-by perennials. Lily of the valley, columbine or clove pink with a few blades of striped grass. Iris, peony, the lilac and rose and so on through the season with a liberal allowance of your favorite annuals, sweet peas, nasturtium, pansy, phlox, verbena, just what you admire most and you will have an abundance. If your space is limited or your time is limited or your purse is limited or whatever the limitation then is your opportunity to show your resourcefulness and the value of each rose or violet or cucumber, or ear of corn is thereby enhanced.

Interest in your garden will cause you to seek the society of other gardeners and you will thus become associated with a class of people who are optimistic and enthusiastic and well worth knowing. You will learn from them that practicing horticulture is a cure for all the ills and ill-humors of mankind. It is balm to the weary, comfort to the sorrowful, occupation for the idle, recreation for the studious, exercise for the sedentary, company for the lonely and pure joy for the normal man, woman or child. If you have no limitations, then indeed does the flower world unfold itself before you and you may fill many hours in the exploitation of your preferences in the flower line. Making a collection of some one kind as peony or gladiolus including a seedling plot gives pleasure and occupation for many empty hours.

SUMMER MEETING

Wisconsin State Horticultural Society

OSHKOSH, AUGUST 17-18, 1921

The meeting was called to order on Wednesday, August 17th, in the Library Building, at 10:30 a. m. President Hays in the chair.

ADDRESS OF WELCOME

BY HONORABLE G. A. BUCKSTAFF

I might start out by saying that you are as welcome as the flowers that bloom in the spring, but perhaps it would be more proper to say that you are as welcome as the flowers that ought to bloom in July and August and did not, because that is what happened to my garden.

The mission of horticulture heretofore has been the raising of food products and flowers, but the new movement towards reforestation should be taken up by all horticultural societies. I do not suppose that there is any one thing that is so necessary at the present time as to study the reforesting of the cut-over and waste areas of the United States.

The men who are familiar with the forestry situation assure us that in less than thirty years, at the present rate, we will have cut off all the timber. If that is so, it is a pretty late date now for us to take up reforestation and to make any efforts in that line. The state organization for reforestation has been organized and is doing good work. They have succeeded in getting through the legislature several bills that will assist, one of them especially, a law to acquire titles to waste lands that are now being picked up by individuals and held until it becomes valuable. If you were to go into the northern part of the state to buy cut-over lands, unless you buy right from the lumbermen who are stripping the land, you would find 90 per cent of the titles came through tax title organizations. Now, if the state has the power to take over that right to acquire by tax title, we could probably acquire a good many thousand acres in the state in that way.

But as you travel through that country and see the devastation, not only of the lumbermen, which of course is legitimate—if the public demand lumber they will have it and the lumberman will cut his lumber—but the waste that comes from fire and is not repaired in any way, shape or manner, that is one of the appalling things. I learned from one of the lumber papers the other day that almost as much lumber was burned every year in this country

as was cut down by the lumbermen. If that is so, why, that is a very bad situation, a very bad state of affairs. Though in the western forests, where the greatest fires occur, they now have fire patrols, lookouts, police, and airplanes, so that within the last few years forest fires have been kept down to some extent by the vigilance of these men. But I should say that one of the greatest things that this Society can do would be to interest itself in the reforestation of Wisconsin and to begin at once and to begin in your own home, your own farm. If you have waste places, set out trees. When the legislature meets, encourage your member to vote for the things that will rebuild the forests of Wisconsin, and if the Horticultural Society of this state has even a small part in bringing about that end, you will have justified your organization since the time it began.

I did not come here to make an address; I came here to say a word of welcome, and in behalf of all the horticulturists of Oshkosh, I welcome you to the city, and hope your meeting will be a profitable one.

PREPARATION AND ARRANGEMENT OF FLOWERS FOR EXHIBITION

BY JAMES LIVINGSTONE, MILWAUKEE

In my younger days, when my brother and I started out to exhibit flowers, we used to go to a great deal of work to prepare them for exhibition and we fixed them up in very fine shape, very fancy, with fancy paper and we used to make the chrysanthemums nice and fluffy, each petal that had a speck on it had to be taken out, and it was a great deal of work outdoors long before an exhibition came. I have seen garden flowers that had a pane of glass put over them to keep the rain from them, so they could be kept in perfect shape. In these days we have gotten away from that. We like to exhibit flowers more in their natural state, which I think is a very good thing. That fixing up of flowers to look artificial is not just what we want at the present day.

In preparing flowers for exhibition, I would say that we ought to begin with the seed pod, have something definite in view, begin right when you sow your seed and grow your plants to the very best advantage, give them very good care all through the season,

watching and taking care of them, and then when you get ready for your exhibition, you will have something fine to select from.

In exhibiting flowers, I think one of the worst conditions that we have to contend with is the lack of space for exhibiting them. For instance, our exhibit here is far too crowded, there has not been space enough provided for it. This exhibit ought to fill half of this hall in order to make it look right and give it enough room to show off to the best advantage. Milk bottles are not the proper thing to stage an exhibit in to best advantage. They are either too short for the long-stemmed flowers, or too long for the shorter stemmed flowers.

Then sometimes the exhibitor is at fault. He wants to crowd too much into the vase that is provided, forty or fifty flowers in a vase where half a dozen would show off to a great deal better advantage. Some of our vases here would look a great deal better if they had fewer flowers. Of course, if you have a proper vase to put your flowers into, you can make a nice display with a big bunch, but where you are confined to a small vase, then it is better to use fewer flowers.

Then, when you have your flowers ready for exhibition, you have got to use a great deal of judgment in selecting the flowers. You have got to know the type, to make yourself familiar with just what is a perfect flower in the variety that you are going to exhibit. Take, for instance, asters. You can select asters that are perfect in form and on the same plant will be single flowers with the center showing. Those with the centers showing should never be exhibited, that is, for double flowers. Of course we have varieties of single asters that are beautiful in their class, but a vase of asters that should be perfect flowers should have a full center and select them with as few blemishes as possible. And so with all flowers, select the specimens that you know are almost as perfect as you can get them in their class.

Another thing in exhibiting is that you ought to pay very particular attention to the premium list, the schedule that is provided. That is one thing where a great many mistakes are made. I see it among the professionals as well as amateurs, that when a class is provided for, say, six flowers, sometimes there would be seven or eight or nine flowers in that vase. Well, the only thing we can do is to disqualify them, because you cannot give it a prize over some that have the exact number. Suppose some exhibitor has the

exact number and has poorer flowers than the one that has eight or nine in the vase, the one with the poorer flowers will get the prize, because he has the exact number according to the premium list. We have sometimes been criticised for disqualifying an exhibitor that had more than the specified number, and I have always maintained that it was the proper thing to do. That is the only way to teach the exhibitor a lesson, to keep by the schedule; next time he is going to exhibit he will pay attention and look up the premium list before he enters his exhibit. You will find in an exhibit of animals a class of three or four animals, for instance, and the judge would not look at an exhibit that had more than the specified number, and we should be just as particular in exhibiting flowers. We have got to keep to the schedule. It gives the exhibitor a better chance and it gives the judge a better chance, because he is not supposed to select the six best flowers in a vase, that is not what he is there for. He is there to judge the exhibit as it is put up, and not to make any discrimination between exhibitors. Each one has got to have the same advantage as the others.

Then there is one thing that ought to be impressed on exhibitors. Every one that puts up an exhibit expects that he is going to get a prize. If they don't get the first prize they expect to get something. You know when there are a dozen exhibiting in that same class, somebody is going to be disappointed, so it is for the advantage of the exhibitor to select the very best specimens that he possibly can get, because you have got to bear in mind that the other fellow is doing the same thing, so that you cannot all get first premiums, and the judge, if he knows his business, is going to look into those exhibits very thoroughly and he may see defects in the flowers that the exhibitor cannot see. We parents usually think our children are the best in the world, of course every parent thinks that, and children cannot all be the best in the world. When we come to our flowers we are very much the same way. We think nobody else is going to beat us, and when we come to the exhibit and get beaten, if we are not good sportsmen we are going to be disappointed and sometimes get "sore." When you come to exhibit flowers you have got to be a good sport; you have got to give the judge the credit, to begin with, that he is honest; we have got to have confidence that we are going to get an honest deal and there are things in each exhibit that the judge is going to look into and see that perhaps you cannot see yourselves.

Perhaps he has got a little more experience on the staging of things, the arrangement might count for a great deal, the arrangement of colors and the way the exhibit is staged, will usually count with the judge, so that when an exhibitor puts up an exhibit, he ought to bear all those things in mind, because the judge is going to criticise things severely. While he is looking for the best points in an exhibit, he is also looking for the bad points, and sometimes a very little thing will throw an exhibit out, and if it gets a place at all, it will be among the lower grades.

I do not know that there is anything else that I can say about the exhibiting of flowers. It is not a subject that you can elaborate on. Almost any one that comes in for exhibiting has had some experience and knows what is wanted, and I would impress again on exhibitors, to select the very best specimens that they can get and then pay very particular attention to the schedule, provide the exact number of flowers specified in the schedule and then stage them to the very best advantage that you can.

If there are any questions that you would like to ask, I will answer them to the best of my knowledge.

DISCUSSION

MR. CHRISTENSEN: Don't you think the amateur usually makes the mistake of cutting the flowers too short?

MR. LIVINGSTON: That is one thing I should have spoken about, to get as long stems on the flowers as you possibly can. Of course, there are some annual flowers on which you cannot get a very long stem. That is one of the disadvantages of annuals, that the stems are short and you cannot always exhibit them to the best advantage unless you have specially provided for that. With some of the perennials and longer stemmed flowers it is an easy matter to get longer stems and to display them to better advantage.

MR. RASMUSSEN: We had great difficulty at the state fair in deciding on a suitable vase for flowers. No two exhibitors agree. What do you advise?

MR. LIVINGSTON: I have seen all kinds of fancy made vases, very expensive and they are absolutely useless in showing flowers to the best advantage. Sometimes you can go into a ten-cent store and get a vase that is worth ten times as much because it shows off the flowers. People are not so much interested in fancy vases as the flowers. I do not see the vase at all, it is the flowers I look at. If you see a well-arranged vase of flowers you are not so much interested in the vase, it is the flowers you look at. It might

be adding to the artistic value of flowers to have a nice vase, to me the vase is of no importance as compared with the flowers.

MR. MOYLE: I was in a building recently where there were floral decorations, and there was an arrangement with a four-legged stool on which was placed a round doiley, on which were placed a dozen zinnias and some wild cucumber vines and that was one of the most wonderfully arranged floral decorations I ever saw. Alongside of it was probably $10 worth of gladiolus, all jammed in so thick that it took all the beauty away. But that one little stand with the few zinnias was one of the most beautiful things I saw.

MR. LIVINGSTON: When you are shipping flowers at a distance, it would be a great advantage to prepare your flowers properly.

I would cut them at least 24 hours ahead of time and put them in water, let them soak up well. Put them in a cool place down in the basement and give them plenty of time to get soaked full of water before you pack them. Always pack them as securely as possible. That is another matter of individual judgment, that is the packing of flowers. There is really no set rule for packing flowers, it comes by experience, you pack them to the best advantage. The main advantage is to get them all thoroughly well filled full of water, all the stems soaked up, all the water that they possibly can hold and then wrap them either with some wet moss around the bottom of the stem, or some wet tissue paper to keep the stems moist and perhaps they could be sprinkled with water, or wet the tissue paper and wrap with oil paper to save evaporation as much as possible. That would be a great advantage in shipping flowers.

COOPERATING IN FRUIT AND VEGETABLE MARKETING

BY MR. C. E. DURST

Mr. Chairman, Ladies and Gentlemen: In talking with some of you last night and this morning, I see that you are not so very familiar with the farm bureau idea. Quite a number of questions have been asked about that, and so I am going to start my discussion by trying to describe the farm bureau, and that will lead me into the marketing question that I am here to discuss.

The farm bureau, I would say, was discovered by accident. The United States Department of Agriculture had some men in the south a number of years ago, studying the cotton boll weevil

larvae, and some of these men, while living among the farmers, helped the farmers with other things besides the cotton boll weevil. When the time of their investigation came near the end, the farmers were very much disappointed. They said to the men, "Now, you have helped us a great deal, and we would like very much to keep such men as you in the field," and that thing gave the Department of Agriculture an idea, and from that idea the farm bureaus developed.

It was seen for a long time that there was a widening gap between the experiment station and the government department of agriculture on the one hand and farmers on the other. Scientific information was accumulating, and it was not passed on to the practical farmers as rapidly as necessary, and so they saw here a need for, and an opportunity to get this information more promptly to farmers.

The first farm bureau was organized in New York in 1911, and the first farm bureaus in Illinois were organized and started on June 1, 1912, Dekalb and Hancock counties starting on those dates. Each county farm bureau hires what they call a county agent. In Illinois we call them farm advisers. These farm advisers work among farmers by means of meetings, by means of personal visits, by means of circular letters and by means of consultations, telephone calls, everything that anyone would ordinarily use to keep in touch with farmers. They are in the county studying farm problems, helping them with their live stock, shipping associations, all those things that are necessary in the practical working out of farm problems.

The farm bureaus are financed in several ways. The Lever act, passed by the United States Congress, appropriates to the farm bureaus some money, each county gets some money from the government. Then, some of the states also give their farm bureaus money, each county I believe now gets about $1,000 a year from the state. Some counties—that practice is more prevalent in other states than in Illinois—appropriate money to the farm bureaus, that is, the supervisors of the county give money to the farm bureaus, and then members of the counties raise money by means of individual memberships. Of course, if there is a pretty strong county appropriation, the membership from the individual farmer is usually lower, if there is not very much of a county appropriation, or none at all, why, the individual membership fee is likely to be high.

In Illinois the most common membership fee for the farm bureau is $10, and it ranges from that all the way down to $1. There is one state in the northwest, I forget just what that is now, where they charge $25 a year.

The idea at first was to organize these counties alone. The thought of bringing those together in larger organizations, as far as I know, did not occur to the people who were leaders in this at the beginning. It was the farmers themselves in the farm bureaus who, in just a few years, saw that they needed some organization bigger and stronger than a county organization to work out large, state-wide problems that they could not handle as counties, marketing problems, legislating problems, etc.

Here I am going to take up the situation in Illinois, because it will illustrate the idea the same as it has developed in all the other states. They went to work in Illinois, about the time they saw they needed large organizations, to form a larger organization, and the Illinois Agricultural Association that I am working with developed out of that. This organization in Illinois is an organization composed of farm bureau members, its membership is limited to the members of farm bureaus. The farm bureaus themselves are not members of our state association. The practical reason for that is that in Illinois the "Not for profit" law, under which the Illinois Agricultural Association is incorporated and under which the farm bureaus are incorporated, that is, the ones that are under that law, one "Not for profit," association cannot have as members other non-profit associations. We have to accomplish the same purpose in another way. We can confine our memberships to the members of other non-partnership organizations, we can confine our membership to people who belong to no other organization.

Now, each member of the I. A. A. pays $5 a year into the state association. Altogether we have ninety farm bureaus organized, they are increasing right along in the state of Illinois, and the Illinois Agricultural Association has a combined membership of about 110,000 farmers in the state of Illinois. So you see it makes a good, strong association, one that is well financed. I do not know how familiar you people are with Illinois affairs; if you read the papers you have read of it and the work it is accomplishing.

It has emphasized very strongly from the start legislative matters, and at all times it has had legislative committees. This leg-

islative committee draws up legislation that it thinks is necessary for agriculture, and during the session of the legislature it keeps a committee on the ground to work in favor of the legislation that it wants, and also to work against any legislation that it does not think is a good thing for the farmers. In the session just closed it did not accomplish all we wanted to in the legislature. You have heard of these land sales which were the hot-bed of contention in the whole legislature. The I. A. A. failed to pass those by six votes. We had a majority, easily, but we did not get the necessary two-thirds vote.

It is interesting to note that practically that same bill has been passed by the Senate and House of Representatives of the United States Congress and simply needs to be signed by the president. The only important difference between that and the Illinois bill was that the Illinois bill prohibited the feature of trading altogether on the Chicago Board of Trade, while the bill in Congress allows future trading in thirteen exchanges of the country and prohibits it in all the others. But the national law is better than the state law, because it is a national law, and so it really is better than if we had passed our bill and got it through.

In the legislative session before this one we succeeded in getting across some very important legislation, quite a long string of fine bills.

Now, another thing that the Illinois Agricultural Association has emphasized from the very start, and this is its major work—legislative part is secondary to this—is the marketing proposition. The farmers of Illinois, as well as everywhere else, felt that the marketing of their products is the thing that needs more attention. The farm bureau, since the start of the work, bore hard on the productive side. Of course during the war that was very important and they rendered a wonderful service, but we have known from the time before the war, and certainly more than ever since the war, that marketing is very important, in fact, it is fully half the game. It is one thing to grow the crops, and it is another to market them, and so, as I say, this state association is working very hard on the marketing line and it is attempting to work out the marketing along the line of departments.

Other state associations have one department, that is, some of them have. In Illinois we have it divided up into four departments. We have the grain department, that took a very prominent

part in the organization this year in the United States; we have the live stock marketing department; the dairy marketing department and the fruit and vegetable marketing department, and since this latter one is the one I have been brought here to tell you about, I will confine my remarks to that.

This fruit and vegetable market development is backed up by a committee of fruit and vegetable growers over the state. They were picked carefully and then they set about to secure some one to represent the work of this department and it happened that they just got me. A number of people have congratulated me since getting this work on the position I got. I told them I did not know whether I got the position, or the position got me, and the troubles I have had in trying to get across farming associations, I really and truly believe sometimes that the job has got me.

We started to work in the state of Illinois. At first it was apparent that we could not take up the problems of fruit and vegetable growers all at one time. Fruit and vegetable market problems are various, have to be approached from different lines. We cannot have one organization like the grain growers. The fruit and vegetable growers that go to distant markets have different problems from those going to near markets. One organization will not answer them both. In Illinois we have the perishable fruit and vegetable growers. First we have the onion set growers around Chicago, and they have different problems from the fruit growers. So we decided at first we would devote our time and money to the developing of the market problem in southern Illinois.

Now, southern Illinois grows quite a lot of early fruit, particularly apples and peaches, grows a lot of late apples, and a lot of crops of various kinds. They have had practically no market assistance at all, up to this time, they have been selling to country buyers, they have been consigning to Chicago markets mostly and naturally have had a pretty hard time.

Now, our department studied the cooperative systems of the country, and developed a plan of organization for southern Illinois growers that was, as far as we could find, educationally, the best of all things from different cooperative organizations. We studied California, Michigan, Minnesota, Wisconsin and all the other organizations, took the best things from each and combined them into a plan of organization. Of course, we had to organize according to the Illinois law. It so happens that in Illinois we have

a pretty fair non-stock "not for profit" law and we used that for this organization. It is called the Illinois Fruit Exchange, organized in central Illinois, June 1, 1921, and the first car of fruit was shipped on June 24th. The organization has marketed from ten different points during the past summer and has organized in seven counties in southern Illinois and more counties coming in later. In fact, our requests for organization work in different parts of the state come faster than we can take care of them.

This Illinois Fruit Exchange is working just like the National Fruit Exchange. We have local units at each important shipping point, those local units have their own local board and have their own local manager. This summer they did work by means of inspection. That is, the farmers graded their products according to a set of rules, and when they were brought in and entered, they were inspected. It was too late to do that this year, but next year all these local points will have what they call community packing houses; all the products will be brought in in temporary carriers and they will be then graded by disinterested parties, standardized, weighed and packed, and then we will have the marketing on its footing a great deal better than was possible under the system of inspection.

Now, the organization also has a main board, and its central office is at Centralia. When local points get their cars loaded, they simply notify the central office, where the sales force is located, and this central office finds a sale for that stuff. In fact, it often has a sale beforehand. The local people keep them informed as far ahead as possible what they are going to have and they therefore look for markets for what the local peaple have.

The organization is a non-profit, non-stock organization, that means, an organization which is not in the business for profit. It can take enough from the returns of the goods to pay for the cost of operation, but beyond that everything that is received by that company belongs to the grower. The exchange has the right to keep a certain amount to use as a reserve fund, but even if it does that, that is money retained by the exchange for itself, and it belongs to the grower.

Now, there is another phase that belongs to the mere marketing problem, and that is the receiving end. I mean the receiving end for such markets as Chicago—well, my receiving market, and that is the end that I am interested in, and I understand that many of you are interested in here in Oshkosh. There are some mighty

serious problems in connection with this receiving end, and they must be approached both from the standpoint of the distant shipper, and also from the standpoint of the local market gardener, because both have a problem in that market, and in Illinois we are considering working out a system at that end that will involve both the problems of the local market gardeners because we have hundreds of them around Chicago, and the problems of the distant shipments. It is going to be a serious problem, because it will have to be approached slowly and carefully, as we have to be absolutely sure that we are correct.

Now, leaving that, I want to say just a few words about the need for organization. Perhaps it is not necessary, yet I want to call your attention to a few reasons why we need to organize, and I mean this from the standpoint of both distant shippers and local market gardeners. The farmers of all kinds, no matter where they are, we have been trying, most of us, to work out our problems individually. It has worked fairly well up to fifteen or twenty years ago, but since that time we have been gradually going down hill, that is, I mean it has been gradually getting to be less and less a profitable game. The reasons for that, if you stop to consider, the history of the United States, you will notice the last fifteen, twenty-five to fifty years have been those of organization along all lines. Look what people have accomplished in that line. They have met with all kinds of opposition, but they have now a very strong organization. I am not here to argue for labor methods, because they have done something they ought not to, but we all have to admit that the labor unions have done a lot of things for themselves that they needed and were justified in having, and they never would have done it in the wide world if they had not organized.

You know what capital has done. Every bank is a member of some banking organization. Wherever you go, people are organized and you know we are the only people that are not organized. Every organization that can will take a slice off agriculture, because it is the only place, the last few years, that any one could get a slice, and so the farmer's products have gotten smaller and smaller and will so continue if we do not get together.

Farmers in other sections are organizing and have been organizing for some time. You have heard what California has done,

it is only one example. Take Michigan, we have some fine organizations. They have an organization to handle peaches; I understand the Minnesota people have an organization to handle their potatoes. The south is getting pretty well organized along fruit and vegetable lines. Florida has a fine organization and there are some fine organizations in the east. In fact, the East Shore Virginia Produce Association handles about $25,000,000 worth of products a year. I am told by the people of the United States department that it has one of the finest sales and accounting systems of any cooperative society in the country.

And then New York is organizing and everywhere they are organizing, and they recognize what it means, because, by means of standardizing, by means of advertising, by means of working out a better distribution system, they are just undermining our place on the market and unorganized people are actually suffering now because of the work of other cooperatives. We have got to begin to do business like the others.

Now, we must, first of all, in working out these things, to standardize products, and that is a thing that we cannot do as an individual. Some people have done it who grow things on a very large scale, but even the very largest growers cannot attract so much attention, because, no matter how great a volume of product they have, it is a very small volume compared to the amount that comes on the market.

Go down to any store here and you will find matches, for instance, all standardized and they are put up in standard packages, name and so on. You can buy them in nice packages, with the name on, and you are satisfied that every package is a diamond match. So are cigars, so are raisins, so are oranges, and every other product that you get you will see standardized methods of handling. Think of the name "Sunkist" on a box of oranges, you do not have to ask about the quality, they are Sunkist oranges, uniform, this month, next month; they have been standardized.

We cannot get standardization unless we do it in a large way, that is, the growers must get together in a general way and work out their standardization methods. This idea of every man having a different variety, there is nothing to that. We may have to settle down on a few for a community, or preferably one, and push that variety as hard as we can by good grading, packing and advertising.

Now, the standardization idea has worked out best in places where they ship product to distant markets, by establishing packing sheds. In southern Illinois we plan to have packing sheds next year. The growers will bring their products in by temporary carriers and grade into as many grades as we find necessary. Then, don't you see, the association can have something that can stand back of it. It will know what it is saying when it describes a certain car of stuff, and it will know whether the rejection we have had at the other end is bona fide or not. We know how far we can hold up on a rejection of that kind, whereas, if we allow each grower to pack we will not know how strong we can go holding up that car of stuff.

Now, we need to advertise products more than we advertise them. I have already mentioned something about the way other lines of business advertise, and you know how fruit and vegetable growers in other sections advertise. Take California Sunkist brand, the Blue Ribbon brand of peaches, the Red Star brand of peaches, the peaches of Virginia; so each important fruit and vegetable section, ought under some brand name standardize its stuff, then put that brand on the best line of stuff and push that as hard as possible. This ought to be followed up by newspaper advertising, perhaps bye and bye by circulars or pamphlets; there are lots of ways of advertising.

Then another important factor is distribution. I do not believe in Wisconsin you have such a concentrated growing of products, except in the case of cherries. Let us suppose that you have a big crop of potatoes and a big crop of cherries—you did have a big crop of potatoes last year, I understand you had a great big crop of cherries this year. In those cases it is a problem of distribution. There is a market somewhere for those potatoes, there is a market somewhere for those cherries, the problem is to have those at the right market at the right time; that is something that cannot be worked out by producers as individuals, that problem of distribution has got to be worked out in a larger way. It has got to be worked out by putting our products together, by pooling them, so to speak, putting our sales service and distribution service into the hands of people who know that game. Market problems have come to be so complex that we have got to have specialists. A man who keeps up with the crop reports and garden reports can distribute stuff to better advantage, put it where it belongs and put it where you can get the most money out of it better than the

average individual can do it. As growers we do not have time to keep up with that. We work all day and either do not have the inclination or are too tired to do it at night. We cannot keep up and for this reason we must put our sales problems in the hands of people who are experts along that line.

Now I want to ask one question and then discuss it. What do we mean by cooperation? You know some people have the idea that cooperation is something that is going to be all good and not bad. You must not forget that cooperation must work both ways. We must cooperate in the things that are good as well as the things that are bad. When a man joins a cooperative concern he wants a big return right away. When we started down in southern Illinois, the men were looking for double the price that they had had before. We did actually get some fine prices, but at one point we had a little hard luck, we shipped some cucumbers, and the first of July there were four days when 79 cars of cucumbers came to Chicago market; cucumbers could not be sold at any price. We did not please those people on the sales of cucumbers. As a matter of fact, I think we did get almost as much as the average grower got, but it did not satisfy them.

Now, when you begin with cooperative associations, you must not expect big results right away. Let us remember that we are starting something new, we must remember that we have got to build up something new, we must standardize our products, you must remember that we are starting out to work out a marketing system, to stand against a system that has been in existence forty to fifty years. If farmers will have patience, if they will stick and pull together, with all the bad things that happen as well as the good things, it will not be very long but what we will see some mighty good results. We need organization, we need cooperation, we need the cooperative spirit.

We have had some objections from various people to this exchange when we organized, and I want to tell you what a few stock objections are. One is that a man does not want to give up his own selling rights. He says, "Well, that is about the only right I have, the only time the trade does pay any attention to me, and I want to have the right to sell my own stuff, I will not give that right over to anybody." I suppose it is a kind of personal liberty that they want. Now, I want to illustrate that by a little example, just what is meant when a man says he wants to do his own

selling. What do you do when you do your own selling? I want to contrast that with the results secured under the two methods in southern Illinois this summer. You know we had a tremendous cold spell about three days down in southern Illinois that killed all the peaches and nearly all the apples, but they did have some apples left.

Now, when we started to do our organization work down there, the people of Alto Pass said, "We are absolutely for organization, but we are not going to have any crop this year; when we see we are going to have something, we will go right in." We said to them, "That is all right, we do not want to force you to have any organization." Well, now you all know very well that the prospect in regard to apples is a very deceiving thing. There were some apples here, some apples there and the first thing you knew, just a week before picking time they saw they were going to have quite a crop. A buyer came in, he was a home buyer, a man who knows the peculiarities of every man there, his weakness or his strong points, knows which man is likely to stand for the lowest price. So what does he do? He goes into the community and visits the weakest man first, buys his apples at the lowest point he can, then goes to the next easiest man, buys his apples at the lowest he can, then tackles the highest one, he says, "Well, now, Bill Smith sold me at that, your fruit is no better than his," and so it weakens the man and first thing you know he had all the apples in that community bought. He bought ten cars of apples and paid $3 a bushel f. o. b. Now, that is a good price. It was not all they could have gotten this summer, though, on account of the short crop. Now, what did he do with those apples? Another buyer came into the same neighborhood a few days later; he did not know the peculiarities of the men, and he said, "If I cannot buy from the growers I will see this other man, I have got to have the apples," and so he sees this other man and buys the same apples for $3.15 a bushel, and so the one buyer made those 15 cents a bushel and he never touched an apple. Is that a legitimate profit? Did he render any real service? I do not know what the second buyer sold them for, but he must have sold them at $7 a bushel, so there are two men to get big profits without rendering any service. Now, did those growers do their own selling? What did they have to say about it? They did not have a thing in the world to say about it. He did the buying, they did not do any selling.

Contrast that with New Burnside, which is a town three and one half miles east of Cairo. Those folks saw they would have some early apples, enough so that they could form a local exchange. They said to us, "We recognize that it is one thing to grow fruit and another thing to market it, and we recognize that the buyer must buy the fruit at as low a price as possible and sell as high as possible. We realize we ought to get together and stop that loss. So they got together in the local exchange, they crated the apples according to the rules of the exchange, and they placed them in the hands of our sales manager for sale. He is one of the very best salesmen in the country. He has good trade connections, he knows the market, because he keeps in touch with it, and he sold those apples at one dollar a bushel at Burnside, f. o. b., which was a better price than was received by these other people.

Another objection is, some men say, "Well, I am going to wait and see how it works. I won't join now, wait till next year." He might as well tell you, "Now, here, I recognize it is going to cost money and it will not work right at the start and may lose even a little at the start. What I want to do, I want my neighbors to bear all that expense and take all that risk and when they get to working nicely, then I will come in." We tell those fellows, if you do not join us now we do not care a rap whether you stay out or come in."

There is a man in Union county, one of the best fruit growers in southern Illinois, and there is no doubt but that his name on the barrel makes it worth a dollar more. He said to me, "I do not believe this thing will help me, because I know I put my stuff up right, I know what a name I have on the market, I built up a special trade, but I have made enough money out of the fruit business, and I am about ready to turn this over to my boys anyhow, and I am going into this thing and work for it, because it is going to be a great thing for the community." That is the way to look at this. I am glad to say we have a lot of people that are ready to get back of a project of this kind. I was in Union county seven years and in Cook county one year, and I realize that sometime we get folks pretty well stirred up. You can see as the effect of this proposition a sort of new spirit, a spirit of forgetting ourselves; we have got to forget ourselves, put our goods together with other growers and then we have got to market our products from the standpoint of the industry rather than the standpoint of the individual.

SOME STAND-BY ANNUAL FLOWERS

MRS. C. E. STRONG

From gardens that I have seen and my own experience, I will try and give you something about Stand-by Annuals. Stand-by in a flower means about the same as it does in a friend. They are dependable.

A few years ago I should have headed the list with the Aster—queen of all annuals, but stem-rot and yellows have taken this flower from its high position and while you may grow them beautifully—yet it is not a dependable flower.

So I will give the Larkspur first place instead, the old-fashioned flower that grew in our grandmothers' gardens and that you see today in nearly every garden of any size. Sometimes the same small purple, white and lavender pink blossoms, but more and more frequently, the improved varieties with their tall spikes emulating the Perennial Delphinium.

Growing beside it in almost every garden is the Pot-Marigold or Calendula that too has changed and the great golden or creamy disks are seen even in the florists windows side by side with their aristocratic cousins of the greenhouse.

Driving around Waukesha last summer I saw Four O'Clocks grown as a sort of filler for foundation planting. They were very effective both as to foliage and bloom. This year I saw rose and white Balsams used in the same manner. While Balsams have always been a favorite of mine I never realized their effective uses as a decorative plant before.

In my trips to the city during the summer, I, as well as every other passenger, view with pleasure a hedge of pink Cosmos bordered and mingled with Euphorbia—or Snow on the Mountain. There were just a few scattering plants at first, now it is most lovely, though grown from self-sown seed and with absolutely no care.

Not far from there, is another garden whose owner is evidently an Iris fiend, for there is not another plant or shrub in the yard. But when the Iris are through blooming it becomes a mass of blue and pink Centaurea or Bachelor Buttons, also self-sown. The

owner evidently tolerates them, much to the pleasure of the passer-by. On a little side street a few years ago was a window box filled with Petunias, now the yard is a riot of color, every sort of Petunia grows there. Evidently that little woman has decided Petunias are a stand-by annual.

In my own garden the Nigella, or as we used to call it,—ragged lady—is a favorite, no other early flower appeals to me, as does this sturdy blue one. It has decided that the vacant spots in the vegetable garden and the beet and carrot rows are improved by its presence.

Zinnias, not the old single brick red or muddy pinks and yellows we used to tolerate, but great dahlia-like blossoms of glowing crimson, scarlet, rose, yellow or bronze shades, delight us now—or, if you prefer, there are midget blossoms in the same clear colors. Verbenas, Phlox D. in the separate colors, or mixed, they are a garden all alone, from early until late, continuous bloomers.

So are the annual Dianthus, they invite you to linger at their side. Salpiglossis and Calliopsis, graceful, fairy like blossoms, waving with every breeze an invitation: "come see us." "No other flowers in the garden have our wonderful coloring." Celosias with their odd combs, and the plumed varieties, especially the Woolflowers, are always satisfactory. Godetias, as beautiful as Azaleas and much more easily grown. Still most people haven't even a speaking acquaintance with them. For two years this flower exhibited at the state fair by Mr. Hauser has caused more attraction than any other annual shown there. Linaria with their dainty spikes of snapdragon like flowers in orchid colorings, will insist quite strongly on a place in your garden of stand-bys if you once grow them, as they self seed and you are not sorry, for they are especially adapted for table decoration. Mignonette, we need her sweetness. You can suit your own taste as to whether you wish the small gray blooms or the newer gigantic reddish sprays.

Those of you who have mourned over your failure in growing Hollyhocks, try the annuals, they never fail to bloom, and though they lack a little of the stately beauty of the perennial sorts, are very satisfactory.

Now, if I were to give you any more it would sound like a catalogue list. These I have chosen for freedom of bloom and freedom from insect pests and disease. Most of them are adapted both for show in the garden and for cutting. Most of them will

grow in gardens, window and porch boxes, and are not very particular as to soil.

I saw nearly all of those I have named growing on a roof, in one of the dingiest, dirtiest parts of Milwaukee. If I have left out some of your particular favorites; why please remember I am not pretending to be an authority, just a flower lover with favorites in the garden just like yourselves.

DISCUSSION

A LADY: I should like to ask what is the matter with perennial phlox when the leaves turn brown from the bottom. Perhaps it was somewhat on account of the dry weather this year, but I do not think it was only that. It seemed like a rust.

MR. MOYLE: The phlox are no doubt covered with red spiders. When your phlox become infected with red spiders, you have a job on your hands. You might as well fold your hands and let them die.

MR. TOOLE: I was told, as a cure for red spider, to spray with lime-sulphur, or spray them heavily with just sulphur. I have tried that and found it partially effective. Besides the red spider there is a rust that affects the phlox as well. The nursery inspector was around to our place the other day and he said in some places he had seen that rust and he did not know any remedy for it. Phlox does not stand extreme dry weather, some varieties especially do not. They are apparently not very deep rooted and need considerable moisture.

MR. LIVINGSTONE: I think some of the trouble the lady refers to is rust on phlox. That is quite a prevalent disease on phlox. Some varieties are more susceptible to this disease than others, but the only remedy I can suggest is to spray with Bordeaux early in the season. In fact, I have found one way to control the disease was to water the roots early in the spring before the growth commences at all, with Bordeaux. In that way it checks the disease before there is any active growth at all. Then, if you keep on spraying through the whole season, you can control it. The best way to fight a disease is to fight it at the start.

ADVENTURES WITH HARDY PERENNIALS

W. A. TOOLE, BARABOO

This is to be a paper without any particular beginning but I assure it will have an end, or at least stop, somewhere. One of the puzzling things in considering hardy herbaceous perennials is the lack of some definite standards as to what constitutes hardiness in Wisconsin. Some kinds, as the Forget-me-not, are quite hardy in winter but find difficulty in withstanding our hot dry summers. Some things are perfectly hardy at Bayfield where the snow is sure and comes early before the ground freezes much, while at Baraboo, where the winters may be more severe, but nearly snowless, some plants may survive but die with the freezing and thawing of spring. Some are hardy on sand but winterkill on clay soil. Just for the sake of some standard I will consider as hardy, any kind that will survive an average winter at Baraboo, with moderate protection and sufficient surface drainage of water.

One of the pretty perennials that seems to be very hardy is the Great Sea Lavender or Statice latifolia. The delicate lavender flowers work in with other flowers when cut much as does the Baby's Breath. With us it has survived all sorts of winters both with and without protection. Our greatest trouble has been in propagation as it seems almost impossible to buy seed that will grow. Every year a great many of the flower stalks turn brown and die just before or during flowering. I can see no signs of disease and the main part of the plants is not affected. I do not know of any remedy.

I have always wanted to grow the Bears Breach or Acanthus. Something about the name seems to attract me but it does not seem to be possessed of any degree of hardiness in this climate.

A couple of years ago we received some plants of Dianthus, Red Grenadin from Mr. Hauser of Bayfield. We have found this very hardy and desirable. The flowers are like a brilliant scarlet carnation, sweet scented, many are double if grown from seed. It flowers in July and vies with the scarlet Lychnis in intensity of color.

Some of our friends from Lake Geneva had told me of the beauty of Rudbeckia triloba, especially if planted in masses in waste places. I could not find it listed in any catalogs but one of the gardeners sent me seed two years ago and they are flowering now. The medium sized golden yellow flowers are borne in greatest profusion and it is very attractive. This plant is a biennial, but self-sows readily and after it is once established takes care of itself.

Like pretty nearly everybody who is kind of "bugs" on growing plants, I do my most enthusiastic gardening in the winter time, and usually buy a lot of seed that never flowers up to description, or never grows at all. Fortunately for my happiness, hope is a hardy perennial with me and I never fail to read the catalogs with interest. One of the things that sounded attractive last winter was the Greek Love Plant or Catananche coerulea. The ancient Greek ladies were supposed to have found it useful in making love potions to attract some desirable male. I don't know how the dope is made, but think there surely must be a little moonshine mixed in to be effective. If any of the ladies wish to try it out, our vice president would seem to be a good subject. You will find some of the attractive lavender blue flowers on exhibition. I am not sure about its hardiness, but rather doubt if it will live with us.

One of the very pretty spring perennials flowering in June is Heuchera sanguinea or Coral Bells. Among the different kinds we have tried, the one known as Walkers Variety pleases us the most. The brilliant though delicate stems of coral pink flowers are very attractive. We have found this variety hardier than others, as it seems to survive our winters with moderate protection if given a well drained place to grow.

Another attractive hardy plant not commonly known is the Leopards Bane or Doronicum. The flowers are yellow and daisy like in form. A few vigorous growing dandelions in full flower in your garden will spoil the effect of the Doronicums however. These (the Doronicums) also need a well drained soil to successfully carry over winter.

One of the new things hailed as something wonderful a few years ago was Meehan's Mallow Marvels, a variety of Hibiscus. The immense flowers like single Hollyhocks are showy because of their size, but after the first view of them there seems little to keep up one's interest. They seem to be hardy for a year or two and then after flowering they winterkill easily.

The above remarks remind me that the question of seed-bearing is important in considering hardiness. Many perennials do not survive if allowed to seed heavily.

The hardy candytuft or Iberis sempervirens is one of those plants that seems very hardy way up at Bayfield but will rarely winter over with us. The Iberis, Alyssum, Arabis and others of the cress family do not root very heavily and are not easy to transplant unless done quite early in the spring. Perhaps as easy a way to grow these as any is to sow the seeds where they are to grow to maturity.

One of the new things sent out not many years ago is Lychnis Arkwrightii, a hybrid between our scarlet Lychnis and Lychnis Haageana. At first I was disposed to be disappointed in it as it appeared no different to Haageana which has proved to be too tender with us and not very attractive. Arkwrightii seems perfectly hardy and flowers for a month or more if not too dry. In England it is recommended for an all summer bedding plant, but our summers are too hot for it to keep flowering all the summer.

During the war a new kind of hardy carnation was introduced in England, known as Dianthus Allwoodii. They are said to be a hybrid between the grass pink and the greenhouse carnation and over there they are creating much interest among flower lovers because of their continuous flowering qualities, as well as size and hardiness. We had high hopes of these and propagated them heavily but find they are lacking in hardiness and do not flower over the whole summer here. In reference to these flowers and their behavior with us, Mr. Kruhm of the Garden Magazine has the following to say: "I was very much interested in what you say. You but corroborate the impression which we have received in many instances. Things that do well in Europe will do well on the Pacific coast but will not do so well east of the Rockies. Our soil and climatic conditions east of the Rockies are very much different from those found in Europe and in California. This is a big story and some day it might be interesting to check up the same experience with other plants of European origin."

This brings us around to this fact; that many of the most satisfactory of our hardy perennials are but developments of plants that are native to this country. Many of the best are to be found growing wild in our own Wisconsin woods and fields and swamps. If you love to go adventuring, hitch up your auto of a Sunday

afternoon and go out seeking what you may find. Get off the main trunk highways and look for spots that have not been pastured heavily. If you see a pretty plant, dig it up with plenty of dirt and carry it back home. Give it careful culture and you will be surprised to find the improvement in size of flowers and vigor of growth. No matter on what kind of soil or exposure you find them, most of our native plants will respond to careful culture in good garden soil. Among the desirable native perennials are two kinds of Phloxes, Shooting Star, Hare Bell, Aquilegia, several Hardy Asters, Cardinal Flower, Hepatica, Heliopsis, Helenium, Euphorbia, Butterfly Weed, two kinds of Eupatorium, Physostegia, Polemonium, Tradescantia and many others.

Probably some imaginative nature lover will get off some sentimental bunk protesting against devastating the beauties of our native landscape by digging our wild plants. This may be perfectly good criticism near our large cities but through a large part of our state, there are thousands of acres of beautiful native landscape where the flowers will be forever doomed "to blush unseen and waste their sweetness on the desert air." Sooner or later most of these spots will be pastured and that will be the end of the flowers. I think it far better to transplant some of this beauty to some place where it can be enjoyed. I am however strongly in favor of preserving unmolested as many beauty spots as is really practical.

Like many other interesting subjects, there is much more that might be said. I hope that these remarks will suggest something to your mind to add, or criticise, as it has always seemed to me that the discussion is the most valuable part of most papers.

STRAWBERRIES

MR. N. A. RASMUSSEN

In regard to strawberries, I am not going to say as much about last year as next year. Last year I believe that one-third of the Wisconsin strawberry crop was lost from lack of covering in time.

Another thing, the growers do not do as much as they ought to do, and that is to study varieties. They will see or hear or read certain articles on certain strawberries that do well in one part of the state, but will it do the same on your land? It is a question

of locality. Because a variety has done well in one county is no proof that it will succeed with you.

They told me I would lose out in having solid Dunlap this year, but I noticed where they were growing Warfield strawberries, shallow-rooted, later foliage, that they had practically no yield at all. While our crop was below the average, still we had a very good picking, and after this year we will pick four acres of Dunlap. Our market is local here, do not ship far. We ship to Milwaukee, sometimes to Chicago, and the Dunlap is preferred by the people at the other end. They ask for the Dunlap. It is getting a little bit harder to get strawberry pickers, and they prefer to pick the Dunlap. The season is a little shorter, but the fruit is larger.

Another thing I think we should do which we never did before, straighten out the runners and cover them. With the scarcity of plants likely to occur next year I think it is up to every man to get them covered up by cultivator or by hand. Your strawberry runners should be covered now. The biggest trouble we have had with the Dunlap and one of the causes for which it has been condemned, is letting the runners get matted in the row, but I do not think they will do it this year. But there is plenty of time yet to get plenty of plants for planting if we will take care of them.

DISCUSSION

MR. COE: There is a berry that you have not mentioned that is really a good one, that is the Dr. Burrill. It has the long roots of the Dunlap, it has a little firmer berry and it is just as good a grower, just as good a yielder. I would not think of growing strawberries without having some Dr. Burrill.

MR. RASMUSSEN: You think it is better than the Dunlap?

MR. COE: In some respects it is, yes.

MR. MOYLE: The Dunlap sometimes is a little shy, has not the pollen bearing capacity that the Dr. Burrill has. The Dr. Burrill is a great pollenizer, and I think any one growing Dunlap should plant Dr. Burrill.

MR. CHRISTENSEN: Do you think it would be advisable to plant any strawberries in August, or in the fall?

MR. RASMUSSEN: Some people want them. I think that is why the nurserymen sell them. I do not think you will ever find a nurseryman planting in the fall, or the commercial men. I do not believe in it at all.

Lower Stacks

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