

Annual report of the Wisconsin State Horticultural Society for the year 1910. Volume XL, Part II 1910

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William Toole, Baraboo, President W. S. H. S.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year 1910

VOLUME XL

PART II.

(Part I, containing Constitution, By-Laws, Business Transactions, etc., distributed to members only.)

F. CRANEFIELD, Editor

MADISON, WIS.



MADISON, WIS. Democrat Printing Company, State Printer 1910



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LETTER OF TRANSMITTAL.

MADISON, WIS., February 1, 1910.

To His Excellency, JAMES O. DAVIDSON,

Governor of Wisconsin.

DEAR SIR:—I have the honor to transmit to you herewith the Fortieth Annual Report of the Wisconsin State Horticultural Society.

Respectfully,

FREDERIC CRANEFIELD.

Secretary.

TABLE OF CONTENTS.

	Page
Officers and committees for 1906	vii
Lists of fruit recommended for culture in Wisconsin	ix
Trees and shrubs recommended	xii
Black list	xvii
Poisons used to destroy insects in orchards and gardens	xix
Spray Calendar	xxii
An outline of the work of the Wisconsin State Horticultural Society	xxiii

SUMMER MEETING.

Transactions of Annual Summer Meeting.

Opening Session	1
The Home Orchard, Dr. T. E. Loope	1
Pears for Wisconsin, Geo. J. Kellogg	4
Cherries & Plums D. E. Bingham	7
Paspherries Blackberries, etc., for the Home Garden, Irving Smith	14
Your Family Strawberry Bed. C. L. Pearson	17
My Home Vineyard, G. W. Reigle Some Recollections of A Hurried Trip Through the Northwest,	20
W. S. Hager Cultivation of the Farm Orchard and Fruit Garden, Prof. J. G.	23
Moore	26
Spraying the Farm Orchard, J. G. Milward	36
Why Farmers Don't Have Good Gardens, J. W. Ingham	42
The Farm Beautiful, John Tiplady	46
Perennials and Annuals for the Farm Home, Chas. Elliott	50

CONTENTS.

V ...

Page

WINTER MEETING.

Transactions of Winter Meeting.

Opening Session	54
Small Fruit Session—	
Report from the Sparta District for 1909, E. A. Richardson	54
Report from Sturgeon Bay Disttrict, D. E. Bingham	58
Report from the Warrens District, W. H. Morse	58
Big Bayfield Berries, Harvey Nourse	59
Strawberries New and Old, Geo. J. Kellogg	63
Report on Strawberries, Henry B. Blackman	65
Does Inspection of Small Fruit Pay the Grower? E. F. Bab-	
cock	66
Small Fruits-Principles of Management, O. M. Taylor. (Dis-	
cussion p. 122)	69
Annual Business Session-	
Report of Secretary	77
Report of Sunt of Field Work for 1909	86
Report of Chairman of Trial Orchard Committee D E	00
Report of Charman of That Orchard Committee, D. E.	80
The 1000 Grow in the Wayson Triel Orchard W H Marsh	90
The 1909 Crop in the Wadsau That Orchard, W. H. Marsh	0.6
Garden of Eden, G. W. Reigie	90
A Chippewa County Orchard of 60 acres, J. W. Melvine	104
The Stanley District, C. L. Richardson	104
Orchard Tillage Session-	
J. G. Moore	106
Dr. T. E. Loope	108
W. S. Hager	110
W. H. Marsh	111
D. E. Bingham,	111
R. J. Coe	113
L. H. Palmer	114
A Comparison of Tillage and Sod Mulch in an Apple Orchard,	
O. M. Taylor	117
The Northwestern Greening Apple-	
I C Melville	125
I. H. Palmer	127
L. C. Kollogr	127
L. G. Meleber	128
A I Dhiling	130
A. J. Fhilips	130
M. S. Kellogg	121
D. E. Binghall	139
W. H. Marsh	132
G. J. Kellogg	120
Mr. Pratt (Mich.)	190
Mr. Cady (Minn.)	130

WISCONSIN STATE HORTICULTURAL SOCIETY

Spraying—	Page
Arsenate of Lead, Mr. Tuck	137
Lime Sulphur as a Summer Spray, Errett Wallace	140
Notes on Lime Sulphur Mixture, A. L. Hatch	149
How to Make Bordeaux Mixture, M. W. Richards	150
A Summary upon Orchard Spraying Extension, J. G. Milward	154
Vegetable Gardening Session	
The Farmer's Garden, A. J. Philips	156
Celery, H. C. Christensen	161
My Experience in Raising Musk Melons, Wm. Nelson	163
The Tomato, N. A. Rasmussen	166
Miscellaneous-	
Contracts, C. L. Richardson	171
Report of Delegate to The American Pomological Society,	
J. G. Milward	175
Student Judging and Identification Contest, Prof. J. G. Moore	177
Washington and Oregon vs. Wisconsin, F. J. Toland	178
W. H. Hanchett	184
Questions and Answers	188
The American Society of Equity, C. O. Drayton	203
My Impressions of the West, W. W. Clark	205
The Small Fruit Plantation, R. L. Post	207
The Door County Fruit District, A. L. Hatch	212
Notes on Gardening and Preserving Fruits, Miss Blanchard	
Harper:	
A Protecting Screen	214
Lettuce	215
Hints from An Old Maid's Garden for Home Gardeners	217
Canning Vegetables from the Home Garden	218
Wisconsin as a Fruit State, G. W. Reigle	220
Report of Eau Claire Fruit Growers' Association	225
Report from Bayfield	226

vi

OFFICERS AND COMMITTEES, 1910.

OFFICERS.

Wm. Toole, President	Baraboo
A. J. Smith, Vice-President.	Lake Geneva
L. G. Kellogg, Treasurer	
F. Cranefield, Secretary	

EXECUTIVE COMMITTEE

Wm. Toole, Chairman	Ex-Officio
A. J. Smith	Ex-Officio
L. G. Kellogg	Ex-Officio
F. Cranefield	Ex-Officio
1st Dist., Wm. Longland	Lake Geneva
2nd Dist., G. W. Reigle	Madison
3rd Dist., L. H. Palmer	Baraboo
4th Dist., F. W. Harland	Milwaukee
5th Dist., H. C. Melcher	Oconomowoc
6th Dist., E. Gonzenbach	Sheboygan
7th Dist., W. H. Hanchett	Sparta
8th Dist., Dr. T. E. Loope	Eureka
9th Dist., D. E. Bingham	Sturgeon Bay
10th Dist., Irving Smith	Ashland
11th Dist., Harvey Nourse	Bayfield

BOARD OF MANAGERS.

Wm. Toole.

L. G. Kellogg.

F. Cranefield.

WISCONSIN STATE HORTICULTURAL SOCIETY

COMMITTEE ON TRIAL ORCHARDS.

J.	S.	Palmer, term e	xpires	;
R.	J.	Coe, term expi	res	2
L.	G.	Kellogg, term	expires	L

LOCATION OF TRIAL ORCHARDS.

Wausau, Marathon County, 10 acres Established	1897
Medford, Taylor County, 3 acresEstablished	1903
Poplar, Douglas County, 7 acresEstablished	1904
Maple, Douglas County, 3 acresEstablished	1906
Barron, Barron County, 5 acresEstablished	1906
Manitowoc, Manitowoc County, 5 acresEstablished	1907
Gays Mills, Crawford County, 6 acres, (1 A. Grapes) Established	1907
Sturgeon Bay, Door County, 5 acresEstablished	1908
Whitehall, Trempealeau County, 5 acres Established	1908
Lake Geneva, Walworth County, 5 acresEstablished	1908
Sparta, Monroe County, 1 acre (Grape Station) Established	1908

viii

LIST OF FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN.

The behavior of varieties of fruits is influenced very largely by 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. The following provisional lists were prepared by the Trial Orchard Committee. Hardiness of plant and fruit bud has been the leading thought in the selection of varieties.

APPLES (General List).

Alexander, Astrachan (Red), Autumn Strawberry, Dudley, Golden Russett, Fall Orange, Fameuse (Snow), Hibernal. Longfield, Lubsk Queen, McIntosh. Lowland Raspberry, Northwestern Greening, Ol-Malinda. McMahan, Newell, Plumb denburg (Duchess), Patten Greening, Perry Russett, Cider, Scott, Tetofski, Talman (Sweet), Utter, Wealthy, Wolf River. Yellow Westfield (Seek-no-Further), Windsor, Transparent.

APPLES (Lake Shore List).

In addition to the above many other varieties including the following may be successfully grown in the extreme southern part of the state and in the counties bordering on Lake Michigan. Baldwin, Eureka, Fallwater, Gano, King, Northern Spy, Pewaukee, 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: Dudley, Fameuse, Longfield, McMahan, McIntosh, Northwestern Greening, Oldenburg, Scott, Utter, Wealthy, Yellow Transparent,

WISCONSIN STATE HORTICULTURAL SOCIETY

APPLES (Five Varieties for Farm Orchard).

Northwestern Greening, Oldenburg (Duchess), Talman (Sweet), Wealthy, Yellow Transparent.

APPLES (For Trial).

These are all promising varieties but have not been extensively grown in any part of the state: Gem City, Hanko, Lily, Wendorff, Zettle Bellflower.

CRABS.

Brier Sweet, Hyslop, Lyman, Martha, Sweet Russett, Transcendent, Whitney.

PLUMS.

Of the classes commonly cultivated, viz.: European, Japanese and Native or American, the last named is the most reliable.

NATIVE PLUMS.

De Soto, Forest Garden, Hammer, Hawkeye, Ocheeda, Quaker, Rockford, Surprise, Wyant.

EUROPEAN PLUMS.

(Not recommended except along Lake Shore). Lombard, Green Gage, Moore's Arctic.

JAPANESE PLUMS.

(Not recommended except along Lake Shore). Abundance, Burbank.

CHERRIES.

Early Richmond. Montmorency.

GRAPES.

Brighton, Campbell's Early, Concord, Delaware, Diamond, Green Mountain, Moore's Early, Niagara, Worden,

LIST OF FRUITS

BLACKBERRIES.

Briton (Ancient), Eldorado, Snyder.

STRAWBERRIES.

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

Clyde, Bederwood, *Crescent, Dunlap, Enhance, Gandy, Glen Mary, *Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES STRAWBERRIES FOR FARM GARDEN. Dunlap, *Warfield.

RASPBERRIES.

Black: Conrath, Cumberland, Older. Gregg, Red: Cuthbert, Loudon, Marlboro. Purple: Columbian.

CURRANTS.

Red: Red Cross, Red Dutch, Long Bunch Holland, Victoria. Perfection.

White: White Grape. Black: Lee's Prolific, Naples.

GOOSEBERRIES.

Downing.

PEARS.

On account of the prevalence of blight and winter killing, 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.

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

TREES AND SHRUBS RECOMMENDED.

EVERGREENS.

For screens and windbreaks—Norway Spruce, White Spruce, White Pine, Austrian Pine, Scotch Pine.

For hedges and screens for shearing-Norway Spruce, American Arbor Vitae, Red Cedar.

For lawns—Norway Spruce for backgrounds. For groups—American Arbor Vitae, Red Cedar, White Spruce, Colorado Blue Spruce, Austrian Pine, Scotch Pine.

For small lawns-Arbor Vitae, Savin Juniper, Mugho Pine.

DECIDUOUS TREES.

The more desirable ones are starred, and a further selection of five is indicated by double stars.

**American Elm, Box Elder, Black Cherry, Carolina Poplar, **Green Ash, *Hackberry, Honey Locust, Larch, **Linden, **Norway Maple, *Scarlet Maple, **Silver Maple, *Sugar Maple, Scarlet Oak, *White Oak, White Ash.

DECIDUOUS ORNAMENTAL TREES.

This class includes smaller deciduous trees of more value for ornament than for shade or defense.

Crab (native), also Bechtel's double flowering crab, Cut-leaved Weeping Birch, Tartarian Maple, Ginnala Maple, Kentucky Coffee Tree, Mountain Ash, Weeping Willow, Russian Mulberry.

TREES AND SHRUBS RECOMMENDED

LIST OF SHRUBS RECOMMENDED.*

Scientific Name.	Common Name
Berberis Thunbergii	Thunberg's Barberry
Berberis vulgaris	
Barberis vulgaris var. atropurpurea	Purple-leaved Barberry
Corylus maxima var. purpurea	Furnle Filhert
Diervilla florida	Weigela (rose)
Diervilla candida	
Diervilla hybrida	Weigela (Eva Bathke)
Diervilla hybrida var. Desboisii	Desbois Weigela
Eleagnus argenta	·····Silver Berry
Euonymus Europaeus	Strawberry Tree
Hibiscus Syriacus	Althea
Hippophae rhamnoides	Sea Buckthorn
Hydrangea paniculata gr	Garden Hydrangea
Lonicera Ruprechtiana	Ruprecht's Honeysuckle
Lonicera Tartarica	Tartarian Honeysuckle
Morus Alba var	Tea's Weeping Mulberry
Philadelphus coronarius	
Philadelphus coranarius var. aurea	Golden Mock Orange
Philadelphus inodorus	Mock Orange, large fl.
Fontentilla fruticosa	Shrubby Cinque Foil
Prunus nana	Russian Almond
Rhodotypos kerrioides	Rhodotypos
Rhus Cotinus	Smoke Bush
Ribes aureum	Missouri Flowering Currant
Robinia hispida	Rose Acacia
Rosa rugosa	Japanese Rose
Sambucus nigra var. $aur \in a \dots$	Golden Elder
Shepherdia argentea	Buffalo Berry
Spiraea Bumalda	Bumalda Spiraea
Spiraea Bumalda var	Anthony Waterer Spiraea
Spiraea Billardii	Billard's Spiraea
Spiraea Douglassi	Douglas' Spiraea
Spiraea Japonica	Japanese Spiraea
Spiraea salicifolia	Meadow Sweet Spiraea
Spiraea Van Houtte	Van Houten's Spiraea
Syringa Persica	Persian Lilac
Syringa villosa	Chinese Lilac
Syringa vulgaris	Common Lilac
Tamarix Pallassi Desv. (Tamarix Amurens	se Hort.)Amur. Tamarix
Viburnum Opulus vr. sterile	Snowball

* From Bulletin 108, Wisconsin Experiment Station, by F. Cranefield,

WISCONSIN STATE HORTICULTURAL SOCIETY

ROSES.

Hardy garden—Harrison Yellow, Persian Yellow, Madame Plantier. Twelve varieties hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Dinsmore, Marshall P. Wilder, Coquettes des Blanches, Earl of Dufferin, Jules de Margottin, Vick's Caprice, Magna Charta, Prince Camille de Rohan, General Washington.

Moss roses-Perpetual White, Salet, Paul Fontine, Henry Martin.

Climbers-Prairie Queen, Russel's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler.

Five hybrid perpetual roses for the garden: Gen. Jacqueminot, Magna Charta, Margaret Dixon, Mrs. John Laing, Paul Neyron.

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRUBS.

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

Tall-10 to 15 Feet.

Barberry (Common) Lilac, Common Lilac, Japanese Golden Elder Lilac Jossika's Honeysuckle, Fly Mock Orange Honeysuckle, Slender Sea Buckthorn Honeysuckle, Tartarian Siberian pea tree (tall) Honeysuckle, Tartarian white

Medium-6 to 10 Feet.

Barberry, purple Crandall Currant Silver Berry Honeysuckle, Blue Strawberry Tree Japanese Rose Spiraea, Billard's Lilac, Chinese Spiraea, Douglas Purple Filbert

TREES AND SHRUBS RECOMMENDED

Spiraea, Three-lobed Rose Acacia Spiraea, Van Houten's Russian Almond Weeping Mulberry Siberian Pea tree (dwarf) Wiegelas

Dwarf-2 to 6 Feet.

Althea Spiraea, Anthony Waterer Barberry, Thunberg's Spiraea, Ash-leaved (Sorbaria) Cinque Foil Spiraea, Bumalda Honeysuckle, Albert's Spiraea, Japanese Hydrangea Spiraea, Meadow Sweet Rhodotypos Spiraea, Plum-leaved .

A LIST OF NATIVE SHRUBS DESIRABLE FOR PLANTING ON HOME GROUNDS.

Scientine Name.	Common Name.
Arctostaphylos Uva-ursi	Bearberry
Ceanothus Americanus	New Jersey Tes
Cephalanthus occidentalis	Button Bush
Cimaphila umbellata	Prince's Dinc
Comptonia aspleniflora	Round-leaved Dogwood
Cornus stolinifera	Red Osier Dogwood
Dirca palustris	eatherwood (Wickony)
Epigaea repens	Trailing Arbutug
Euonymus atropurpureus	Wahoo
Hypericum pyramidatum	St John's Wort
Ilex verticillata	Winterberry (Holly)
Juniperus procumbens	Trailing Juniper
Myrica Gale	Sweet Calo
Physocarpos' opulifolia	Ninchark
Rhamnus catharticus	Buckthorn
Rhus Typhina	Staghorn Sumao
Rhus Glabra	Smooth Sumac
Rhus copallina	Dwarf Sumac
Ribes rubrum	Wild Pose Current
Ribes floridum	Wild Plack Current
Rosa lucida	Wild Rose (tall)

XVI WISCONSIN STATE HORTICULTURAL SOCIETY

Rosa blanda	Wild Rose (dwarf)
Rubus odoratus	Purple-flowered Raspberry
Rubus Nutkanus	White Flowered Raspberry
Sambuscus Canadensis	Common Elder
Sambusus Canadensis	Common Elder
Cambucus Canadensis	Scarlet Elder
	Snowberry
Symphoricarpus racemosus	Coral Berry
Symphoricarpus vulgaris	Ground Hemlock
Taxus baccata	Shoonhorry
Viburnum lentago	Sheepberry
Viburnum dentatum	Black Haw
Viburnum acerifolium	
Viburnum opulus	Bush Cranberry
Zantoxylum Americanum	Prickly Ash

SIX SHRUBS FOR HOME GROUNDS.

The following are all reliably hardy in any part of the State: Common Lilac, Tartarian Honeysuckle, Rosa Rugosa, Mock Orange or Syringa, Van Houten's Spiraea, Common Barberry.

THREE HARDY PERENNIAL VINES.

Ampelopsis or American Ivy (native in southern Wisconsin). Wild Grape, Trumpet Honeysuckle.

BLACK LIST.

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED ON THE GROUNDS OF THE EXPERIMENT STATION AT MADI-SON AND FOUND UNSATISFACTORY.

Scientific Name.	Common Name.
Azalea arborescens	Rhododendron
Azalea viscosa	Rhododendron
Azalea nudiflora	Azalea
Azalea mollis	Azalea
Calycanthus floridus	Sweet-scented shrub
Caryopteris Mastacanthus	Blue Spiraea
Chionanthus Virginica	White Fringe
Clethra alnifolia	Sweet Pepperbush
Colutea arborescens	Bladder Senna
Cornus florida	Flowering Dogwood
Cydonia Japonica	Japanese Quince
Daphne Cneorum	Daphne
Daphne Mezereum	Daphne
Deutzia gracilis	Slender Deutzia
Eleagnus longipes	Goumi
Exochorda grandiflora	Pearl Bush
Forsythia suspensa	Golden Bell
Halesia tetraptera	Snowdron tree
Itea Virginica	Virginia Willow
Kerria Japonica	Korria
Ligustrum vulgare	Common privot
Paulownia imperialis	Faulownia
Prunus cerasifera var. (Prunus pissardi Hort)	Purple-leaved Dlum
Prunus Japonica	Flowering Almond
Prunus triloba	owering plum (double)
Spiraea Arguta	Arguta Chiraco
Spiraea Thunbergii	Thunberg's Spirace
	spilaea

The plants of certain of the above named varieties made a good growth each yeaar but have not blossomed unless given thorough B.

XVIII WISCONSIN STATE HORTICULTURAL SOCIETY

winter protection. In this class are Bladder Senna, Flowering Almond, Flowering Plum and Golden Bell.

The Japanese Quince is hardy of bush but has not borne flowers except when given winter protection. The Goumi will only bear fruit when protected in winter. The double-flowered Almond will blossom freely if given thorough winter protection, otherwise it will kill back severely. The double-flowered Plum grows well and after a mild winter will bear flowers in advance of the leaves; unreliable, however, four years out of five if unprotected.

The others of this list have either died outright or else barely survived.

POISONS USED TO DESTROY INSECTS IN ORCHARDS AND GARDENS.

PARIS GREEN

A well know poison used to destroy biting insects, as the apple worm, tent caterpillar, potato bettle, etc.

Formula

Paris	Green		1	to	2 lbs
Fresh	(unslaked)	lime			1 lb.
Water	••••••			200	gals.

One-half pound of pure Paris Green to 50 gallons of water is sufficient to destroy codling moth and other insects in the orchard and fruit plantation if properly applied.

Add 1/2 lb. Paris Green to every barrel of Bordeaux mixture and make a complete spray.

ARSENATE OF LEAD.

(A Poison for Biting Insects.)

This poison is better than Paris Green for the following reasons:

(1) It remains longer in suspension.

(2) It adheres better to the foliage; one thorough application being sufficient for the entire season.

(3) It may be used in any reasonable quantity without danger of injury to the foliage.

Use at the rate of 2 to 3 lbs. to 50 gals. of water or Bordeaux.

Add 21/2 lbs. of Arsenate of Lead to every barrel of Bordeaux mixture and make a complete spray.

WHITE HELLEBORE.

(For Biting Insects.)

Used to destroy currant and cabbage worms and on fruits and vegetables where more poisonous substances cannot be used with safety.

Formula

Powdered white hellebore..... 1 oz.

Water 2 to 3 gals.

It may also be used in the powder form mixed with flour, gypsum, soot, etc.

WISCONSIN STATE HORTICULTURAL SOCIETY

BORDEAUX MIXTURE.

The Unviersal Fungicide. Not a cure but a preventive of fungous diseases.

Formula.

Copper	· Sulfate				 	 	•		•	•		•	•	•			4	lbs.	
Fresh	(unslaked	1)	lir	ne	 	 							•	•			5	lbs.	
Water					 	 	•	• • •				•	•			5()	gals.	

Dissolve the copper sulfate in 25 gals. of water in one barrel or cask. Slake the lime so as to make a paste which dilute to 25 gals. in another barrel.

The lime water should be strained to remove coarse particles which clog the nozzles in spraying.

Pour these two solutions together into a third barrel and the resultant mixture is Bordeaux.

Add 2 to 3 lbs. of Arsenate of Lead to every barrel and make a complete spray.

Caution: Use only wood, copper, earthware or glass vessels in making Bordeaux.

Stock Solution for Bordeaux.

The above formula and directions may be followed when only small quantities are used. When ten barrels or more are used at one application always employ stock solutions.

For example: Dissolve 100 lbs. sulfate in 50 gals. water.

Slake 100 lbs. of lime and dilute to 50 gals.

Then use the following formula:

Water .	(approximately)	45	gals.
Sulfate	Solution	2	gals.
Lime S	olution 2	21/2	gals.

LIME-SULPHUR COMPOUND.

Home Made.

(From Bulletin 16, W. S. H. S.)

Formula.

Fresh (unslaked) lime	15 lbs.
Flowers of Sulphur	15 lbs.
Water	allons.

Directions for Preparation. In a kettle of at least forty gallons capacity heat twelve gallons of water. In a separate vessel mix fifteen pounds of sulphur with water enough to make a thin paste. Pour the paste into the heated water and when the mixture is near the boiling point add fifteen pounds of lime. After the lime has completely slaked, boil for one hour, stirring to prevent caking on the sides of the kettle. Then strain into the spray tank (or barrel) and add sufficient water to make fifty gallons of the mixture.

Lime-sulphur wash diluted as above is used only on dormant plants. Where large quantities are used a steam cooking plant is almost a necessity.

XX

POISONS USED TO DESTROY INSECTS

SELF-BOILED LIME AND SULPHUR.

(Bulletin 213, N. J. Agr. Exp. Sta., Sept., 1908).

"In this combination only the heat of the slaking lime is relied upon to unite it with the sulphur, and the formula is:

Lime, best quality	40	pounds.
Sulphur—flowers	20	pounds.
Water	50	gallons.

Place the lime in a barrel and dust in the sulphur with it, so that the two may be well mingled. Add boiling water enough to start a brisk slaking, and cover with a heavy blanket to confine the heat. Add hot water as needed to keep up the slaking and stir occasionally to aid the combination. Keep this up until the lime is fully reduced and mixed with the sulphur. Then let the combination stand covered for an hour to maintain its heat; afterward dilute with warm water to the desired strength and spray at once.

It should be remembered, in making all these mixtures, that enough heat is needed to melt the sulphur and bring it into combination with the slaking lime. It matters little whether the heat comes from a fire or from slaking lime or from caustic soda. For the mixtures made without fire, the water used in slaking should be boiling hot. If cold water is used the heat of the slaking lime is used up in heating the water, and not enough remains to combine the sulphur. It is only the sulphur in combination with the lime that acts as a scale-killer. The uncombined sulphur helps nothing and the surplus lime is a positive drawback, since it makes the wash too thick to penetrate well."

COMMERCIAL LIME SULPHUR.

Concentrated Lime Sulphur compound is offered by several different firms.

The commercial product is a clear reddish liquid and is used by diluting with cold water.

xxi

LET US (S)PRAY

			WH	EN?	On Chan L WING	REWARKS
WHAT?	WHY?	How?	1ST SPRAYING	2D SPRAYING	3D SPRAYING	
Apple	Scab	Bordeaux Mixture	Just before Blos- soms Open	Just after Blossoms Drop	10 days after 2d Spraying	
	Codling Moth	Arsenate of Lead combined with Bordeaux	Just after Blossoms Drop	10 days later .	Last week of July or 1st week of August for 2d brood	1st and 2d Spraying same as 2d and 3d for scab; merely add arsenate of lead to Bordeaux
	Oyster Shell Scale	Lime-Sulphur	March or early April but before growth starts			Do not use Lime- sulphur on grow- ing plants
Cherry and Plum	Mildew and Shot- hole fungus	Bordeaux Mixture, 3-4-50	When leaves are about ¹ grown	10 to 12 days later	10 to 12 days later	
Currant and	Mildew, blight and Currant worm	Bordeaux and Arsenate of Lead	When leaves are fully developed	2 to 3 weeks later		
Grapes	Mildew and Anthracnose	Bordeaux	Before leaf buds open	2 to 3 weeks later	3rd, 4th and 5th ap- plications at inter- vals of 2 weeks if required	
Strawberry	Leaf-spot or blight and leaf eating insects	Bordeaux and Arsenate of Lead	When first leaves appear	After Blossoms fall		
Raspberry and Blackberry	Anthracnose and fungous diseases	Bordeaux	As above	2 weeks later		Spray new growth after fruit harvest

xxii

INSIN STATE HORTICULTURA

AN OUTLINE OF THE WORK OF THE WISCONSIN STATE HORTICULTURAL SOCIETY

The Wisconsin State Horticultural Society conducts field work at sixteen different points as indicated on the map.

The 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 55 acres and 5445 trees in addition to two acres of grapes.

The orchards at Wausau, Medford, Barron, Poplar and Maple are "Trial" Orchards, being for the purpose above indicated; the Sparta vineyard is also in this class.

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

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

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

The Society has recently (1909) undertaken the task of improving the grounds of the 7,000 rural schools of the state. (See 1909 Arbor Day Annual, p. 41.) A comprehensive plan has been adopted and the first steps taken.

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 (250 pages) containing articles by experts on orchard culture, small fruit and vegetable gardening and the decoration of home grounds. Sent free to members.

Issues bulletins on practical subjects written in plain language and free from technical terms including pruning, spraying, planting, etc. Sent free to members and others who apply.

WE ANSWER QUESTIONS

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

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

Maintains a membership of 158 life members and over 1,000 annual members. (Feb., 1910.)

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 knows 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.

WM. TOOLE,

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

Annual membership 50c.

Life Membership \$5.00

Remit to Secretary, Madison, Wis.

xxiv

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING.

La Crosse, Wis., August 25, 1909.

MORNING SESSION.

The meeting was called to order by the President, Mr. William A. Toole, at 10 o'clock, in the Court House.

After the invocation by Mr. Irving Smith, the president announced the first subject on the program, "The Orchard, Location, Varieties, etc." and called on Dr. Loope to speak on the subject of "Apples."

Dr. Loope: In regard to the location of the home orchard, there are a great many homes in the state of Wisconsin that have no location that would be of any use for a home orchard. The location ought to be one reasonably high and well drained; never anything else.

In regard to varieties, that is where we differ; here is where our roads will part right away. In the home orchard there is one tree that you absolutely must not plant, and one apple that must not be in the home orchard, the apple of discord, because it will bear something that will make trouble all the time and you cannot take care of it. The apple of discord is entirely discarded in my home orchard. But for fifty trees for the home orchard, I would say, 10 Wealthy, 5 Duchess, 5 Northwestern

WISCONSIN STATE HORTICULTURAL SOCIETY.

Greening, 5 Whitneys, 5 Tetofsky, 5 McMahon, 5 Snow, or Fameuse, 1 Wolf River for shade, I Sweet Crab for the children

Now, you will notice in that list I have no really good winter apple, and in all the lists for your home orchard you had hetter leave out all the real good winter apples. What I mean by that is, that the regular old fashioned winter varieities, such as are grown in New York and Ontario and Michigan, we cannot raise. There is no use planting them; they will die. There may be favored localities where you can put in that class of fruit in this state, but there are not many of them, and the main part of the home orchard you must devote to the summer and fall apples, and if you do that you can grow all the apples you can use on fifty trees such as I have named. You would not be able to use them all.

The reason I put in the Wealthy is because the Wealthy is one of the best apples grown in Wisconsin or anywhere else. I put in the Wealthy, because, if you are near cold storage, and you have ten or twelve trees, they will fill your barrels with Wealthies, put them in that cold storage and take them out in February, March or April, and you have the finest eating that anybody ever had in an apple. So you can have apples all winter long, if you are near cold storage.

As regards culture; it is quite a mooted question. I have been to quite a number of horticultural meetings, in Missouri, Illinois and other states, and I find just as much diversity of opinion there as there would be here today, probably. The fad that they have just now is clean culture; it is a very fine fad; if you are going to have the very finest ideal for an orchard, you have got to keep it clean, free of sod, without anything green between the trees, because that is the ideal condition.

The question of culture in the home orchard is quite a burning question, because we know and you know and every one knows that the home orchard is the neglected place on the farm. If there are any Canada thistles, quack grass, or any of those things to be grown on the farm, they are grown in the home orchard. The trees are neglected, they are not pruned, and once in a while a tree will die under such use, and they will come around and say, "Why, we cannot raise apples here, the trees die." I have quite a large orchard of some five thousand trees, and I find in that orchard the trees die, but before this I have made this statement, that in the community in which you live some of your neighbors die, and sometimes you cannot tell why they have died, at other times the cause of their death is very plain, and it is the same law that governs both the individual and the orchard, I think.

There are a good many other things in connection with the home orchard. The home orchard will not get spraying; ninetynine out of every one hundred home orchards, in Wisconsin we will say, are never sprayed. Now, if you are going to educate the people of Wisconsin to the point of having home orchards, you have got to teach them to spray, and we have some gentlemen here who have been at that business this year, I am glad to say, giving demonstrations and working along that line, and I think that ought to be spread all over the state and that lesson ought to be thoroughly given.

In regard to the pruning question, every man has a way of pruning. Of course there are certain general principles in regard to pruning that are established, but when you come to the actual pruning, there are a great many people that have their own notions I have a orchard that I have never pruned, and I have less apples on them, and I am going to put a tree butcher in and clean them out bye-and-bye, and I hope to get better fruit, and maybe as much as I have had heretofore, but I believe judicious pruning is a good thing.

A Member: Would you plow an orchard that has been in blue grass sod now, or wait till spring?

Dr. Loope: Not now, wait until spring.

Mr. Hager: I do not agree with the doctor on the grass part and I do not want this society to go on record in favor of grass orchard, because if you do, the tendency is that they will quote this society as saying that grass is all right, and they will seed them down about the second year.

Mr. Periam: As to the question of plowing an orchard, it is self-evident that it would be ruinous to any orchard to plow it just as the orchard is ready to go to rest for the winter, because it generates a second growth.

Mr. Palmer: I practice plowing last thing in the fall, plow as shallow as I can; I never had bad results, and I think I have good results as far as curculio is concerned.

Dr. Loope: Do you have any blue-grass sod?

Mr. Palmer: I do not let any blue grass get in at all.

WISCONSIN STATE HORTICULTURAL SOCIETY.

PEARS FOR WISCONSIN.

GEO. J. KELLOGG.

In 1854 I did not know much about Wisconsin as a fruit state; who did? I had helped my father graft in a little seedling apple nursery in 1840, two and one-half miles north of Kenosha, and had helped harvest nice, large, rare, ripe peaches on his farm. After my return from California in 1853 I bought seedling peaches eight miles west of Racine at \$1.00 per bushel. That same year I bought 40 acres on the prairie two miles south of Janesville on which I expected to raise an abundance of fruit; my hopes I think were based on the fact that there were three dead peach trees on the place.

In 1854 I bought 100 apple trees of Colby & Willey grown only one mile from me; 100 apple trees grown by F. K. Phoenix, Delavan, Wis; and 100 apple trees grown by J. Bell, of Springfield, Wis. These were planted 40 by 40 feet covering about 12 acres. I commenced planting every other row pears and plums, making the orchard 40 by 20. Of the apples why not plant castern varieties, we are on a line west of New York. Who at that time knew any better? Of pears I planted dwarfs and standards any variety I could buy; I had the encouragement of my brother-in-law Dr. Ozanne who had a successful pear orchard seven miles west of Racine. Of plums they were all of European varieties.. The Americans had not come from the woods at that time.

The winters of 1853 and 1854 gave us our first severe Horticultural lesson. My zeal for pears continued and I planted two trees for every one that died; this is a good rule if you have the right soil and good common sense. I did get in ten years a small basket of Louise bon de Jersey, nice pears, from a dwarf. About this time I stated at our Horticultural meetings that pears grown cutside the influence of Lake Michigan, in Wisconsin cost \$10.00 each. I kept on planting pears in spite of the winters of 1853-4; '62-3; '74-5; and '82-3. During these years I had known Dr. Robinson and F. W. Loudon to grow pears quite successfully on the high ground west of Janesville where the Janesville grape, the Jessie strawberry and the Loudon raspberry had their birthplace; and I had seen in the city of Janesville a half dead Flemish Beauty bear two bushels of nice pears. I had succeeded in growing a row of seedling pears on a high gravel hill that bore some poor fruit and gave quite a success to top grafted Kieffer. I had reduced the cost of pears to \$5.00 each in this 45 years of unsuccessful efforts.

After the winter of 1898–9 when the dry freeze killed for me 75,000 apple trees, 2,000 roses, three acres of vineyard and all plum and pear stock I quit growing pears on the prairie. There is one little monument of my pear folly still standing; a Flemish Beauty 30 years old standing south of the carriage house and nearly covered up by an Austrian pine, that does bear a few scrawny, cracked pears.

In 1899 I came to Lake Mills planted Flemish Beauty, B de Anjo, Bartlett, Clapps Favorite and Kieffer; standards on clay soil, about 20 feet above and near Rock Lake, which is 3 miles by 2 including the mill pond. These all died but Bartlett and Kieffer. Bartlett has borne three full crops and no blight; Kieffer has also had to be propped up and then broke down with fruit. The other trees blighted and winter killed before fruiting. John Schultz on the N. W. side of this lake had a successful pear orchard of a dozen varieties and grew bushels and bushels of nice pears for the market.

I had a fearful attack of "pear fever" eight years ago while delegate to Michigan Winter Meeting, as a result I bought a dozen Dwarfs, the Duch. de Angouleme bore one pear that weighed 19 ounces and died. Clapps Favorite, Sheldon, Bartlett, Louise bon de Jersey, and Flemish beauty all died before fruitage. Koonce still lives but no fruit. C. des Nantes has become a half standard and has borne three crops and is now loaded to breaking; this is a very large pear of excellent quality, which I have repeatedly exhibited at the state fair. This year Bordeau, which looks in tree and leaf almost identical with C. des Nantes, is carrying its first crop and is supported on all sides for fear of breaking; this is a pear about the size and shape of the Bartlett.

As vacancies occur in the pear row I set in Kieffer trees to top graft and now have eight Kieffer carrying the following twentyone varieties, C. des Nantes, Worden, Seckel, Peffers No. 4, No. 5, and Russian Seedling; Rhiels Best; Starratt, of Phil Cheek; B. Clariague; Flemish Beauty; Bartlett; D. de Angouleme; Pres. Druard; Lincoln; Marguerite; L. bon de Jersey; Mt. Vernon and

WISCONSIN STATE HORTICULTURAL SOCIETY.

6

Burkett; Bordeau; Wilder; Vt. Beauty; and Peffers Seedling No. 6; five varieties in fruit this year, Bartlett; Bordeau; C. des Nantes, Kieffer and Clapp Favorite. Most of the Kieffer are entirely worked over and what surprises me is I have had no blight for five years. One Kieffer is growing twelve kinds that promise fruit next year. I shall have about two bushels of No. 1 pears this year and can now grow pears at one cent each.

I attribute my success to high clay soil, contiguous to the lake, careful cultivation, wrapping the trees in winter with ropes and cat-tail flags or corn stalks, thorough spraying and top grafting on Kieffer. With fifty-five years experience growing pears in Wisconsin I would advise setting on high clay soil with free circulation of air avoiding any fertilizers, planting Kieffer standard to use as a stock to top graft, plant also C. des Nantes, Bordeau, Flemish Beauty and Bartlett, preferably dwarfs; careful cultivation, wrap in winter; thorough spraying and a general pinching back of vigorous shoots.

Mr. President I have thus given my failures and successes; believing it will benefit more than any theory I might advance. My 74 years in Wisconsin and 55 years in the nursery business ought to be worth something.

Mr. Hager: I would like to ask if Mr. Kellogg would advocate setting pears in the so-called home orchard for the average farmer?

Mr. Kellogg: If you are on clay soil, try it. Do not spend your last dollar on it. I would not plant on prairie soil unless I wanted to fool away my money; I did that for forty years and got no returns.

Mr. Periam: Mr. Kellogg uses the word "clay," now, what kind of clay was that, whitish or yellow?

Mr. Kellogg: Yellow clay; alluvial clay.

Mr. Periam: That solves the question; it is not blue clay. Pears have no business in blue clay; still the white clay north of Chicago is very fertile in pear culture; they raise a great many in Waukegan, but it is the quality of the clay soil that has helped you out. I may as well say that my friend Kellogg's experience was more serious than that of a Bostonian in relation to pears. Mr. Kellogg says it cost him five dollars apiece, now he has reduced the price very considerably. This Bostonian, they were making fun of him for growing pears; he said, "Why, gentlemen, pears do not cost me much; I can raise them for about 75 cents or a dollar apiece." I do not think I ever raised pears that cost me less than five dollars.

Mr. Kellogg: I got them this year so that they did not cost me a cent apiece.

CHERRIES AND PLUMS.

By D. E. BINGHAM, Sturgeon Bay.

I have no paper prepared on cherries and plums.

In regard to cherries; about fourteen years ago, when Prof. Goff and Mr. Hatch went to Door county they figured that the European plum business would be a wonderful success, taking the general lay of the land and the nearness to the water into consideration, they thought that plum culture there would be as sure a thing as they could enter into, and planted out about sixteen acres of European plums, with perhaps two or three varieties of the natives and as many of the Japanese varieties. Those trees did very well for a number of years, but the shothole fungus, which attacks the foliage of European plums, and of course of the Japs and of the cherry, attacked these, and being in the nursery, we did not have a chance to spray them, and of course that injured the trees somewhat. Following a hard winter, nearly all of the European varieties were dead, the result, no doubt, of the defoliation the previous summer. The Japanese varieties still stood that test, the foliage did not fall as much as on the others, the shot-hole fungus seemed to attack the foliage on the Jap varieties earlier in the season, and they seemed to renew and go on with the later foliage, which was good and did not show as much injury, and consequently lived through the winter. That is about fourteen years ago. The Japs are still living, the Europeans are practically cleaned out, with the exception of perhaps two or three hundred trees on a lower, sandy soil.

This year and last year also the winters were very mild, mild enough so that on the Jap varieties the fruit buds lived through the winter and we had a good crop last year and this year of the Burbank. Europeans have the disadvantage of being a little

WISCONSIN STATE HORTICULTURAL SOCIETY.

weaker in the tree but are a little stronger in the fruit buds than the Japanese; Burbanks are hardy in the tree, but in the fruit buds are more tender than the Europeans. With us the native plum has never proved successful, until this year. I have a fair crop of Wyant, Forest Garden and Hawkeye. It is the only crop of natives I have of ten years' planting of trees, and they are vigorous and healthy, and with the exception of the extra amount of work that we have put on the pruning of them, they have cost no more than others, but the fruit up to the present time has cost more per basket than either European and Japanese.

Perhaps there would be no necessity of entering into the matter of energy culture, except we might mention the importance of keeping the trees well topped, and leaving on the first growth that we get, until we get a crop of fruit from that wood.

You understand in planting out a cherry orchard our main object is to get fruit early, get them to bearing as young as possible, get them to pay their way, and we figure closely on the amount of growth that we get each year. Trees this year of six years' planting produced three cases of cherries each.

In regard to the different varieties of plums, one has to consider location and soil and the care one can give a tree in order to make them profitable. I think a crop of Burbank plums one year out of three would be a paying proposition. This year we had trees about fourteen years old that had forty baskets a tree. Those can be planted twenty feet apart; that would make 108 to the acre; that would be equal to a thousand dollars revenue per acre. You might get that crop once in five years in favored localities; even so it is profitable to grow them. We have averaged about one crop in three years right along that has been usually a good crop; we have had a few scattering plums, and a light crop a little oftener than that, say every other year; but last year forty trees on a farm that we had rented gave us about 400 baskets of Burbank. In the vicinity of La Crosse I would not plant anything but the natives. I would plant such varieties as Hammer, Surprise and De Soto. The Wyant with us is a little late, perhaps it might be earlier here, it is too late to make it very profitable, and not very good quality.

The varities of cherries that we grow there are only two, the Early Richmond and Montmorency. We have other varieites coming on well, the Wragg cherry for instance is a good producer; we have trees of this variety that have been planted four-

8


Cherry trees at Sturgeon Bay, 3 years planted.



Neglected cherry orchard, Sturgeon Bay, 4 years planted. A few scattering trees only remain which proves that something besides climate is needed to make a profitable cherry orchard.



SUMMER MEETING.

teen years that every year since they were planted have produced cherries, a few specimens the first year and every year since they have produced crops of cherries increasing gradually. There seems to be an imperfection in the foliage that we cannot control by spraying, the new growth seems to be injured by the winter. These trees are practically dwarf, and we pick from the ground. They produce only three cases; a Montmorency of the same age would produce ten cases.

Mr. Reed: I have in Winnebago county an elevation of 150 feet; would you advise me to plant cherries up there?

Mr. Bingham: I do not know; there is something peculiar about the cherry. In Richland county, where cherries seem to do as well as any section of the state that I have visited, I find that they get about two crops of cherries in four years, about every other year a crop, sometimes two crops in five years, and the reason for it does not seem to be frost, it seems to be weather conditions, or climatic conditions that do not favor the fruiting of the cherry. You will notice in all those sections the trees run considerably higher than in our section of the country, or along the lake, showing that there is something in the soil or climate of other sections that is not just suitable to the cherry tree.

You will notice in all the experimental orchards we have the growth of the cherry is high, all the bottom limbs keep dying off early, when the trees are three or four years old you see those limbs die. With us the trees from the ground up are nice, solid, healthy foliage; it is a healthy condition of the tree that keeps those bottom limbs alive, and there is where we get our fruiting wood.

The President: Do you know that in Richland county they practice such thorough spraying as you do at Sturgeon Bay?

Mr. Bingham: I do not know that they spray as thoroughly, but spraying is practiced; they do not cultivate them as thoroughly as we do. One thing about the cherry is very important, and that is, to give it constant and thorough cultivation. I think there is nothing that will injure a cherry tree as much as to put it in sod, even for a season, even if they are large enough to produce fruit. If you check the growth of a cherry tree it turns the bark rather dark, and next year those trees are more apt to be broken off with the wind, you will find the wood more rotten.

Dr. Loope. You have made a success of cherry growing, a great success, the question is, whether the people in other localities in the state of Wisconsin except those favored localities on the lake, can grow those cherries, whether they had better buy fruit than plant them. That is the question that is of interest.

Mr. Bingham: I think cherries can be made to thrive in more sections than those favored sections that you speak of, if the trees were given proper care. Our cherry trees, if we give them cultivation, make good, rapid growth every year, and then the conditions are right to ripen up the wood. Of course, in some sections of the state, on rich soils, the trees do not ripen up the wood as quickly as the cherry ought to do; the cherry ought to be mature by the middle of July, and we find sometimes they get nipped a little by the winter if they are not mature early enough in the season. Oftentimes in institute work a man will ask the question "What is the matter with my cherry trees; they are not healthy, the foliage falls too early, turns yellow and falls off; the tree looks all right until the foliage falls." That is the shot-hole fungus, and the man is not spraying, and there is nothing that will injure a tree more than the foliage falling. In this orchard I spoke of, the man neglected spraying one year, next year he tried to remedy that. but we found those trees were more rotten, and would break very easily with the wind, more easily than would have been the case had they not had that check at that time, and they did not get over it for a number of years.

Mr. Geo. I. Kellogg: I want to ask if the Burbank is hardy enough with you as a tree?

Mr. Bingham: The tree is perfectly hardy; I do not know of any tree in our orchard that is hardier than the Burbank; much hardier than the Abundance, under our conditions. The fruit buds will stand more cold, and bear fruit better than the Abundance.

Prof. Moore: We have to consider that Mr. Bingham is growing cherries on a commercial scale. I do not believe that Mr. Bingham recommends that cherries can be grown in the majority of this state on a commercial scale?

Mr. Bingham: No.

Prof. Moore: We are talking about home orchards, and we have got to confine ourselves to the fact that in the home

SUMMER MEETING.

orchard we are going to try things which we know are not going to be a success financially; that is, we are not going to make money out of them, simply because we want something for use in the home, we must sacrifice a little in the way of cash to get that. If a man does not grow his cherries in his home orchard, he is not going to have any cherries, in nine cases out of ten, and for that reason he ought to plant some cherries, even if they do not give him cash returns, in order to have fruit for his home. I think we must not consider in this talk what we are going to do from the commercial standpoint, but the question is the home orchard, to consider it from that standpoint when we come to plant cherries.

Mr. Periam: What is the best cherry you have from the money standpoint?

Mr. Bingham: I think from the money standpoint there is not very much difference between the Early Richmond and Montmorency; the crop on one is about as great as the other. The hardiness of the tree is very similar; the care the varieties need is indentical and the fruit of the Montmorency is perhaps a little bit larger than the Early Richmond, and that is about the only difference. Take a handful of Montmorency and a handful of Early Richmond, no one can tell the difference by quality or color or shape. I have tried that time and again, no one can tell the difference. They are both of the Morello class, sour cherries.

Mr. Kellogg: I think the Early Richmond as a general thing in a farmer's garden is very unprofitable, the robins take every last cherry, they do not leave enough for a pie, if there are two bushels to the tree; that is the case in our county.

Mr. Bingham: I was just going to mention that if you have four or five trees, there might be a little advantage in having other fruit which the birds might take and leave the cherries. They are good judges of fruit and take what they want. They will pick out sweet cherry trees anywhere in the orchard and take those because they are a little nicer than the sour, but I believe every farmer ought to have a few cherries planted and take care of them right.

Mr. Smith: What varieties would you recommend for one to set, say ten plum trees for home use, in the northern part of the state?

Mr. Bingham. To be sure of plums nearly every year, I

would plant two or three Burbank, two or three natives of the good varieties, and two or three European varieties, of the hardiest sorts.

Mr. Smith: Name those sorts.

Mr. Bingham: Moore's Arctic, or Green Gage. Green Gage is a nice plum and hardy.

Mr. Smith: How about the Abundance, did we not see the Abundance on your place?

Mr. Bingham: Yes, but I would prefer the Burbank to Abundance for sureness of crop and hardiness of tree.

Mr. Smith: What is the objection to setting a few Abundance.

Mr. Bingham: Well, if you want my judgment in the matter, it would be the Burbank in preference to the Abundance. The Burbank is bearing this year, but with us the Abundance is not, it has a smaller fruit bud, very much smaller and weaker, and it may bloom perfectly and yet not set any plums.

Prof. Moore. Is not that due to brown rot?

Mr. Bingham. I do not think so; it seems to be a weakness of the fruit bud.

Mr. Kellogg: I object to Burbank and Abundance and Moore's Arctic for the southern and central portion of the state as not hardy enough.

Mr. Hager: How about Brown county?

Mr. Bingham: We cannot succeed with Japanese plums away from the Lake. There is a great area in this state where we have to confine our plum planting to native varieties. At La Crosse and all through the southwestern part of the state, I would not advise anything but the natives also through Crawford and Richland county, but when we get to the lake quality and productiveness is enough better to warrant planting Japanese varieties. I think any one planting native plums along the lake would experience more of a failure than in planting the Japanese from the fact that they do not do well in that damp climate, they do not bear.

Mr. Kellogg: I want to hear from L. G. Kellogg on cherries; he has had an experience that is worth something, just with failures.

Mr. L. G. Kellogg. I have made an utter failure in growing cherries for profit. I planted out about ten acres of cherries, Early Richmond and Montmorency, and I succeeded in obtain-

ing three or four crops. I gave them absolutely clean cultivation; I did not spray; mildew got into the cherry orchard and took the foliage off the trees, and that was the end of the cherry business.

The President: Do you think that spraying at any time would have saved the trees?

Mr. L. G. Kellogg: I do not think spraying would have saved the trees; that is my candid opinion, and I do not think you can make a success of growing cherries upon a prairie loam soil and give the trees absolutely clean cultivation. I think if you practiced clean cultivation until about the fifth or sixth year, and then seed down and cultivate between the rows, leaving grass grow under the trees, you may succeed in growing cherries upon a prairie loam soil. I know we have cherry trees growing in that vicinity that are fifteen to twenty years of age that are still producing cherries, cultivated in that way.

Prof. Moore. Mildew is very easily controlled by spraying. It is a fungous disease on the outside of the leaves, and it is the easiest thing to get at.

Mr. Bingham: While we consider Door county very favorable to the production of cherries, still I have no doubt that anyone would meet with absolute failure there in cherry culture in five years' time if he did not spray; if he did not control the shothole fungus, and mildew, he would have no orchard whatever. That has been illustrated at Sturgeon Bay by one one man who did not believe in spraying; there was simply a barbed wire between his orchard and another (sprayed) orchard; and his orchard was destroyed in one year with shot-hole fungus followed by a hard winter, and the trees were wrecks; he lost his erop of fruit that year and the following winter cut off twothirds of the tops of the trees; and after that he went to sprayng, and his new trees are perfectly vigorous and healthy.

Mr. Smith: I would like to ask one question regarding location. At Ashland is some land which is mostly clay, with a little loam on top, perhaps it might be called a heavy clay loam lies about seventy-five feet above the lake, you can see the water beyond the town. There is nothing to prevent a free circulation of air; is that a good location for an orchard?

Mr. Bingham: I would say, we have cherry orchards in Door county on red clay, with a little loam on top, and I see no difference in the health and vigor of those trees over the others; the only difference is, you know sandy soil needs more fertilizing than soil that has a heavy clay subsoil, and one of our most successful orchards is planted on a red clay soil, very red clay, just like the Superior red clay. Cherries will do well on clay if elimatic conditions are favorable and given careful cultivation.

Mr. Buehler: Do you set out one or two year old trees.

Mr. Bingham: I think one can be successful using trees of either age. The two year old trees are larger; the one year takes a little more training than the two year old tree.

SMALL FRUITS.

RASPBERRIES, BLACKBERRIES, CURRANTS AND GOOSEBERRIES.

IRVING SMITH, Ashland, Wis.

The matter of cane and bush fruits for home use, should be given more attention than is unually given it. The amount of room required and labor given are very well repaid in the additional variety and quantity of fruit for the home Raspberries follow closely table both summer and winter. the strawberry, keeping up a continual supply of fresh table Gooseberries and currants come in turn during the fruit. raspberry season; and while they are not so much used in the fresh condition, a dish of well ripened white currants, sugared a half hour before eaten make a very nice evening fruit for any one who likes a mild acid fruit. As for gooseberries, I think they would be used much more in the various forms of cooked fruit if you would just forget that your grandmother used to make green gooseberry pie, and let them get ripe before picking. There is as much difference between green and ripe gooseberries as between green and ripe peaches. Blackberries follow in close succession with little or no break between them and the raspberry.

There are a number of good varieties to choose from, in Raspberries, which must of course be governed to a certain extent by local conditions. Cuthbert and Loudon are very fine red sucker varieties. The Cuthbert being the strongest grower with us, also

SUMMER MEETING.

continues longer in season. Both are very fine. Columbian is the best of the purplish colored sorts and propagates from the tips of the canes like the black caps. If you have room for only one red variety let it be Columbian. Gregg is, in the writter's opinion, by far the best black cap. A row 100 ft. long of each variety named will give you an ample supply of fruit for any ordinary family, and also enough to give some to your friends.

Set the Loudon and Cuthbert about 3 ft. and the Columbian and Gregg about 5 ft. in the row, placing the rows 6 ft. apart. Bear in mind that no wild raspberries or blackberries ever grow in a swamp. So do not choose a drained swamp or you are likely to fail.

As soon as the fruit is off all the bearing canes should be cut out close to the ground; and the young ones thinned out leaving a few more than you expect to leave for the next crop, to allow for some being broken in covering. You should have four to six canes in each stool, and two to four canes per foot of row in sucker varieties for bearing. This point is governed by the size of growth.

Two methods of pruning the bearing canes are in common use. One is to nip the end of the cane when about two feet high, which causes a strong growth of the laterals and makes a low, branching bush. Then trim all the branches to fifteen to eighteen inches. This method applies more particularly to the Columbian and Gregg. The other is to allow the canes to grow naturally and then cut back to good strong well ripened wood on the Loudon and Cuthbert and on the other two cut at about the highest point of the cane. The writer prefers the latter method. It is less work and produces very good results. If you have time to spare of course one can push fruit growth by petting.

The only variety of gooseberry that is worth considering for the average home garden is the Downing. It is a heavy bearer of choice fruit about the size of cherries and becomes a yellowish green and is semi-transparent when ripe. Three or four bushes will produce enough for most families.

The Prince Albert currant now stands at the head in most sections. It is a vigorous grower, about four feet high and produces a heavy crop of large bright red currants hung on short well filled stems. As a jelly currant it is surpassed by none. Four or six bushes is enough.

The White Grape and White Dutch vie with each other for the

first place as a white currant. The White Grape is the largest fruit but the White Dutch is less sour and probably a little heavier bearer. Both are good to eat fresh or as a canned fruit, and both make beautiful jelly. Set four to six bushes.

Black currants. If you can find a variety that will fruit, set about half of one bush. If you fail to get any just get a few chinch bugs for flavor and you will not need the black currants. Set all the currants and gooseberries in a row seven feet from the raspberries. Set currants five to six feet apart and gooseberries three to four feet. Trim so each branch has free space to grow; they should not crowd or touch each other. When the bark changes color from a red green to black it is time to cut out that cane. Of course a few new ones must be left each year to replace the old ones. If you can, it is a good plan to go over the bushes after fruit is off and cut out the old black ones. It gives better chance for the younger ones to develop.

Watch for currant worms. They will appear first on the gooseberries. Poison with White Hellebore—one tablespconfull to two gallons water. Sprinkle with water can.

Blackberries are the last to ripen and the least planted. Probably because they are more or less uncertain in many localities. The writer's experience with blackberries has been a great deal like most others, not wholly satisfactory. Ancient Briton and Snyder are the most common and the methods of culture are similar to raspberries. If you get a good crop a row 100 ft. long will be enough. If they do not fruit you certainly have enough and to spare.

All through central and northern Wisconsin raspberries and blackberries need winter protection. Probably the surest way is to bend down the canes and cover with earth.

All these fruits need good cultivation. Keep the weeds out, and fertilize annually. If the patch should get badly overrun with grass it is better to set a new patch than to try to get the grass out.

Prof. Moore: I think the Pearl gooseberry discounts the Downing a great deal; a much heavier bearer and just as nice a berry.

Mr. Smith: The Downing will bear until they cannot stand up; then what more do you want? Prof. Moore: We get larger returns from our Pearl bushes than the Downing.

Mr. Kellogg: That paper is a very good paper for the beginner. I got one promising idea from it, that of flavoring jams and jellies with the chinch bug.

YOUR FAMILY STRAWBERRY BED.

C. L. PEARSON, Baraboo.

Growing strawberries is such an easy task that I will not make it appear difficult by reading a long essay. A family strawberry bed is easily within the reach of every farmer or any person who owns or controls a few rods of tillable ground; their cultivation is a pleasure while you are anticipating the possibilities of an enormous yield of the lucious fruit strictly home grown and the fun really begins with the ripening of the berries.

Having available ground the next question is in regard to plants; order of a reliable plant grower and you will be likely to get varieties which will pollenize and bear fruit.

I have known farmers to order plants of nursery agents at \$2.50 a hundred and when fruiting time came round there were no berries. The cause of failure being the improper mating of varieties. Good plants can be bought at \$1.00 a hundred or less and two hundred plants will supply a large family with berries besides some big ones to brag about and give to your friends. A good list of varieties is Warfield, Beder Wood, Dunlap, Crescent, Sample and Aroma and there are others.

The ground should be prepared early in the spring as for other garden crops. About May, 1st is the best time for transplanting. A spade or garden trowel can be used in setting the plants which should be in rows about $3\frac{1}{2}$ ft. apart and 18 inches apart in the rows. The soil should be firmly pressed about the roots.

A family strawberry bed can be cultivated with a hoe and garden rake but if a horse and cultivator are available so much the better. If the plants send out too many runners cut off some of them and the result will be larger plants and better fruit.

About Nov. 1st cover the plants lightly with straw or some

2-H. S.

coarse litter. In the spring remove a part of this covering leaving enough to help hold moisture in the soil and also keep berries clean. All that is necessary now are a few balmy days and the whole family may enjoy a month of genuine strawberry happiness.

Mr. Davis: I would suggest for the Warfield and Dunlap, that they would be better planted three feet in the row and three and one-half feet between the rows. I have been trying that way, and I think that is plenty close enough. You get too many plants most of the time then.

Mr. Hager: In a home garden, as a general thing fewer plants will be produced, because it will not be cultivated as well, so that I believe the same rule will not apply as to commercial growing. I would not advocate a person setting out two hundred and setting them that way.

Mr. Davis: I think you get plenty of plants any way; I think farmers as a rule have too many plants and they are not particular about thinning them out. I have grown them in the garden before I have grown them commercially, and I think plants should be $2\frac{1}{2}$ by $3\frac{1}{2}$ at the most.

Mr. Periam: We have had most excellent success in planting Warfield and Dunlap; they are planted three feet apart one way and eighteen inches the other; they were planted last spring and pretty well covered the ground. They were planted in the oldfashioned way, with an old post spade and trod down and we had a pretty good crop of berries; that was due to the fact that the last year was very dry, that the strawberry plants had better roots than usual, but for commercial work we must have a horse. The width apart that they should be planted depends upon the kind of berry. Some berries are strong growers. I think the mistake made generally among the amateurs is that they leave the roots too thick, that is, they leave too narrow a space between rows. I choese to have, not a matted row, but a row about ten inches across.

Mr. Davis: I would like to suggest the Bubach as the berry that has given the best satisfaction among home growers, that is, for table use, not for canning; the Bubach, Dunlap and Warfield, Dunlap as fertilizer, and of course these will have to be set at least 18 inches in the row as they do not run very well. I think you can get more quarts off the vine than from any other berry.

Mr. Kellogg: The Dunlap is generally used for a fertilizer; it fertilizes all right, but it does not produce the fruit; it does not hang on and carry out as big a crop of fruit. It is the berry for any one to plant if they have but one kind, but I am never satisfied with the result. I am growing thirty now, but the Dunlap and Warfield go together nicely, and I think one Dunlap and two Warfields would be about right for a successful crop, if the Warfield will do well on your ground. If you are subject to drouth and blight, the Warfield will be a failure. Bubach is successful once in about four years with me. It is a fancy berry and on clay soil will do well.

Mr. Pearsons: How is Sample with you?

Mr. Kellogg: Sample is all right. Sample is one of the best pistillates, and Cooper is the finest fertilizer for Sample that I know of, a well shaped berry.

Mr. Periam: Mr. Kellogg says that the Warfield will do well if the soil is all right for it. Is not that just as true of the Dunlap as it is of the Warfield, or is it not just as true of any other variety as it is of this? It seems to me that that is the real factor in the case. I never could raise the Bubach although I have not tried of late years. Sometimes the Dunlap does not seem to do very well; again it produces more berries than the Warfield, and so it goes. It is according to the variety and year and soil largely.

Mr. Kellogg: And the man.

The President: Iwould like to say in regard to Bubach, I have seen it attempted many times and have seen some fine berries, but in our part of the world we have had so many failures that we dropped Bubach a long time ago. I am satisfied if you try to raise Bubach you have to set your plants early so as to get the plants early enough to be perfect before winter. I have seen fine plants that failed to blossom the following year; I think it is quite important to use fairly early plants so that they are mature enough to get a crop the year following.

Mr. Kellogg. There are a good many varieties that make plants all right; Dunlap and Warfield will run all over creation, and climb over into your neighbor's lot and get you into trouble. Certain varieties like the Bubach and a number of other varieties you can plant together a great deal thicker than the Dunlap and Warfield; you can plant them three or four feet apart and they will cover the whole ground.

Mrs. Howlett: I think what Mr. Kellogg says about the Warfield is right on certain kinds of soil. We had an experience with the Warfield and Brandywine, the Warfield in drouth would dry out until there were no berries at all, while we had good crops of Brandywine on the same ground, right in the same locality. I think the Warfield dries out worse than some other varieties do on heavy soil.

Mr. Kellogg: Brandywine I consider one of the best late berries; I am glad to have it mentioned.

GRAPES.

MY HOME VINEYARD.

G. W. REIGLE, Madison, Wis.

My apple orchard, my strawberry plantation, my home vineyard, orally pronounced, are really more euphonius than "revise the tariff downward," "man behind the gun," or "big stick," and to many of us the former phrases easily hold first place in importance.

What grateful shade "my home vineyard" suggests. What harmony of cdors surpassing even those of the sunny Indian island. Where else repose such tonic virtues the results of which have produced constellations of Rogers and Munsons. When and where the vine originated is quite as obscure as the early history of Greece and Rome and like the treasures of these ancient civilizations have survived the "dark ages," "the black plague," and "the brown rot," and is now pretty well distributed throughout the enlightened portion of the globe.

Its range of distribution surpasses that of the apple and like the apple succeeds best where wisdom is exercised in selecting varieties adapted to the soil and to the elimatic conditions. To illustrate this, I think of no better example than that of the Worden grape.

In Wisconsin it ranks among our best, but in nearly all parts of the South this grape is practically worthless.

The home vineyard presupposes a shelter, a bit of land, a family, and a man: not one of those two-legged animals whose cerebrum is honey-combed with the mycelium of that incurable fungus of chronic laziness and carelessness.



Note the difference in the root system; the one long and fibrous, the other short, weak and apparently diseased.



FIG. 2

Usually the top soil is better supplied with humus than the deeper layers. This richer soil should be used to fill in the bottom of the excavation and to cover the roots. Firm the covering of the roots with both feet so that the earth shall come in close contact with each root.



Many details of grape growing for the home I shall of necessity omit; taking it for granted that the ordinary methods of planting and tillage are so well known that comment on this part of my theme might prove wholly superfluous. The accompaning cuts and their legends will however help materially to make clear the brief discussion of details.

First Year.

1. Select well-drained soil, such as will produce good corn.

2. Buy No. 1, 1-year old selected vines N. Y. standard from an honest grape specialist. See Fig No. 1.

3. As a rule plant in the spring, twelve to fifteen inches deep leaving a saucer-shaped depression around the young vine. This basin should be filled in gradually as the season advances. Fig. No. 2.

4. After planting cut off all but one cane; on this leave two strong buds. (See Fig. No. 2 (1) and (2).

5. Do not plant in sod. Thorough tillage is imperative for best results.

6. The buds left (See Fig. 2 (1) and (2) will develop shoots variable in length; these shoots should be buried with earth in the fall after planting. Under normal conditions this earth covering is all the covering necessary. See Fig. No. 3.

Second Year.

1. Train the two canes, after pruning to about three feet in length, to a three wire trellis and then permit the vines to grow without pruning except the more vigorous growers which may be pinched when the shoots have reached the top of the trellis (four to six feet). See Fig. 4, Spring, Fig. 5, Autumn.

2. For the best results, clean cultivation is absolutely necessary from the time the soil is dry enough to cultivate in the spring until the fifteenth of September.

3. In Wisconsin fall pruning and protection from the severities of winter—the same as for the first year (See Fig. 2)—is recommended. Caution:

4. Do not allow the vines to overbear: two or three clusters to verify the variety are all the vine should mature.

5. When pruning, an important fact to keep in mind is that this year's fruit will grow from shoots of new wood arising from wood grown last year.

The home vineyardists of this state have little to fear from the various rots and mildews for the reason that the standard fungicides intelligently applied controls them.

The bird's-eye fungus, however, presents an entirely different proposition since it does not yield readily to Bordeaux mixture and spreads rapidly on leaf, fruit and vine. The remedy for anthracnose as this fungus is sometimes called is to remove from your vineyard all dead leaves, diseased fruit and rubbish. Wash or spray all vines, wires and posts with a 50% solution of iron sulphate in late spring before the foliage starts to grow. Heroic spraying with the standard Bordeaux mixture will then usually control this troublesome disease.

The grape is not subject to the ravages of the codling moth, nor the curculio in my locality, (Madison, Wis.) is easier to harvest and market than the apple, a more certain crop for me, and is an ideal fruit for the amateur to begin with, since he need not wait from six to ten years for results.

I recommend in black grapes for the home, Moore, Worden, Concord; in red, Delaware or Brighton and in white, Moore's Diamond or Niagara.

The honey bee by some strange magic may by feeding and manipulation convert a larva in any common or vulgar brood cell into that most wonderful of created things, the queen bee. So the tree and the vine have elaborated a potent elixer whose power has metamorphosed many a common clod and behold a king over fruits has appeared.

It was along time ago when the tree said unto the vine "Come and rule over me." The vine becoming greatly troubled with her added responsibilities said one day to man "Do come and rule over me."

And thus it came to pass that a living soul became the guardian of both the tree and the vine and has continued thus even until the present day.

I was able this year, after a long search, to find some samples of anthracnose, and I will leave them here, and those who do not know it can come and look it over for themselves. I brought this along because I thought it was of enough importance for you to know it, so that you can spread the good work if you find vineyards that are affected by it. This is the Worden grape.

Mr. L. G. Kellogg: Does the antrhacnose very often attack a grape vine?





FIG.3

Showing winter protection.

When the earth covering is considered inadequate, an extra covering of coarse manure will give the desired protection.



Plant the vines seven feet apart in the row; the rows should not be less than six feet apart; seven feet to nine feet for the vigorous growers is the common practice.



After the foliage has fallen in the autumn of the second year the vine may resemble Fig. 5.

Beginning at the left, the second, third and fifth canes may be pruned back to the horizontal arm, leaving one bud. The other canes may be cut back so as to leave six or seven buds.





SUMMER MEETING.

Mr. Reigle: Yes, all you have to do is to examine the leaf, and here are three berries that are well marked, where it is just beginning. Last year it was very bad and spraying had to be done frequently, as often as every seven or ten days, to keep in check. This year, as I said, it is very difficult to find it at all anywhere; I found it in two vineyards.

Mr. Kellogg: I would like to have go on record the best five varieties you would recommend for family use.

Mr. Reigle: I will name for the southern part of the state, or any part of the state where they will mature, Concord and Worden, Moore's Early, the Delaware for a red in place of Brighton, and for green, Niagara, first choice, Moore's Diamond second choice, for the southern part of the state and where they will ripen. I do not know whether they will ripen up in this part of the state or not.

Prof. Moore: What do you recommend for an early green?

Mr. Reigle: I would not recommend any early green; the only early green that I know of that amounts to anything is the Green Mountain.

Prof. Moore. Have you tried Moore's Diamond?

Mr. Reigle: I mentioned that being second choice for a green, Niagara first and Moore's Diamond second, that is in the southern part of the state. In the northern part of the state I understand the Concord does not ripen, in that case I would not plant it; I would plant the Moore's Early.

Mr. Kellogg: Wherever you can grow Dent corn you can grow Concord grape, and wherever you cannot grow anything but Yankee corn, you will have to plant something early.

AFTERNOON SESSION.

SOME RECOLLECTIONS OF A HURRIED TRIP THROUGH THE NORTHWEST.

W. S. HAGER.

After leaving St. Paul, one hundred miles west on the Canadian Pacific, there is not much of interest to a Horticulturist. Wheat, oats, and flax, with a few pieces of raw prairie here and there. Most places no fruit trees, very few gardens, and in

newer places not even a cotton-wood windbreak. It looks to me, even in the green summer and the golden harvest, bleak and desolate. What must it be in the winter? Houses there are for shelter, but homes in a true sense there are but few.

Having heard of the Kootenay and the Okanagan Valleys as fruit growing centers, we left the main line at Medicine Hat and crossed the Rockies through the Crow's Nest Pass and came down to Kootenay Lake at Creston. There were some small orchards here and they were well loaded.

Down the Lake there were few what I should call, available sites as the mountains came down to the water's edge. However, the enterprising promotor and real estate men had been here and up the Columbia and had laid out orchards on paper and in some instances had sold quite steep sites at the foot of the mountains along the river at prices from \$150 to \$250 per acre, covered with a dense growth of timber which would cost from \$100 to \$150 an acre to remove, trees and stumps.

I saw no orchards here but heard great stories as to what the land would do.

It is told that at Nelson, a small mining town, a stranger sat at the water's edge fishing. Suddenly, hearing a splash, he turned around to see a man crawling up out of the water, who, thereupon, began to apologize for disturbing the fish and explaining that he had fallen out of his orchard, and qualified it by saying that this was the second time today. However this may be, a person looking at the scenery from the boat would not doubt it.

Leaving the Columbia at Revelstoke one sees nothing in fruit until the Salmon Arm of the Shuswap Lake is reached where we saw some fine apples and thrifty trees. Land here suitable for fruit raising is high priced and with little chance for water. From here to the cost we saw no orchards of interest.

At the Exposition we saw some fine fruit from Hood River, Yakima Valley and Wenatchee. Each locality, of course, claiming superior advantages for growing choice fruit and quoting premiums and prizes to prove it.

Stopped off at Wenatchee and saw some of the orchards there. It is a valley which has been under irrigation for eight years, where the Wenatchee River joins the Columbia. Absolutely nothing grows without irrigation. There are about fourteen thousand acres in orchards of which fifteen per cent. perhaps are

bearing, mostly apples, although peaches, plums and cherries do well. Trees make a wonderful growth and commence bearing at three years of age.

Leading varieities grown are the Wine Sap, Delicious, Spitzenburg, Jonathan, Rome Beauty and Black Ben. Saw William Turner's orchard which produced the prize car load at Spokane last year. W. T. Clark has one hundred acres. Leddy Bros. have one hundred twenty acres, ninety acres bearing. Every man in town seems to be an apple enthusiast. And they have the goods. I did not see a dead tree nor a blighted twig or a wormy apple. They spray three times and have a thorough inspection of orchards and fruit. They get from \$2.00 to \$2.50 per box, F. O. B., and the returns are almost incredible. I talked with several growers who claimed to have received last year from twelve to fourteen hundred dollars per acre, net.

Very few orchards are for sale and these at from two to three thousand dollars per acre. Saw several who claimed to have refused three thousand.

Raw land that water can be gotten on is worth \$500 an acre. Nearly all the land below the ditch is all set. However there is a pipe line across the Columbia and that side is being developed.

There are various pumping schemes and irrigation projects up the Columbia which perhaps are as good as Wenatchee.

They certainly are raising some fruit as they shipped one thousand cars last year. What will they do when the other eighty-five per cent. of the planting comes into bearing?

Will the favored valleys of the West be able to over-stock the apple market?

Mr. Kellogg: You did not invest while you were there?

Mr. Hager: Not yet.

Dr. Loope: Are you going to?

Mr. Hager: The future is uncertain.

Dr. Loope: Are they sure of getting a crop every year?

Mr. Hager: They must have got a crop last year, for they shipped a thou and cars, and they certainly have a crop this year—not all varieties were bearing this year, but I saw a large percentage of the trees were either propped up or should have been propped up.

Mr. Reigle: Did you learn how long after trees are set they begin to bear.

Mr. Hager: Yes, I made inquiries from several growers, not of men who had anything to sell, but simply went around; one place in particular I stopped where a man had five-acre tract, he said, "Four years ago next Sunday I came here; you see what I have."

Mr. Reigle: Did he have apples?

Mr. Hager: He had apples; he had cherry trees set out three years ago last spring of which the trunks were from four to five inches in diameter. They make twice the growth that they do under the most favorable circumstances in Wisconsin. I saw seven or eight year-old trees, and judging from Wisconsin standards I should say they were twelve to fifteen years old.

Mr. Reigle: Do they have a longer growing season?

Mr. Hager: Well, evidently not very much; it must be the soil. They have cold weather there; they admit the thermometer goes from ten to twenty below zero.

Mr. Kellogg: How much time were you able to spend in the fruit valleys?

Mr. Hager: In that particular place I spent twenty-four hours.

Mr. Kellogg: There is no more land left?

Mr. Hager: Very little in the Wenatchee Valley. I saw but two little pieces in the drive that I took about the valley.

Mr. Kellogg: All irrigated land?

Mr. Hager. All irrigated; could not raise a thing without it. But they get \$2.50 a box.

The President: When I was listening to our friend Hager I was almost scared lest we would be put out of business, but I recovered when I heard the prices they receivd, for while they may feed the rich, there will be a market for our Wisconsin apples among the great masses of the people.

Mr. Hager: Those prices that they quoted me are the net prices there, the other man pays the freight.

CULTIVATION OF THE FARM ORCHARD AND FRUIT GARDEN.

PROF. J. G. MOORE.

When your secretary asked me to discuss this subject he explicitly stated that it was to be considered from the standpoint

of the busy farmer, and not as the man who grows fruit as a business would look at it. In accordance with these instructions I will endeavor to stick to the text, but for fear that at times some of you may think that I have forgoten, let me state here that the line which marks the difference between the cultivation of the orchard of the busy farmer and that of the commercial fruit grower is not as clearly drawn as is often times thought.

As a horticulturist, and especially as one who is interested in increasing the extent of fruit growing in Wisconsin, I suppose I should enthuse every time the home orchard is mentioned. I must confess, however, that when I think of the conditions under which nine-tenths of the home orchards of the state are expected to bear fruit I can see very little over which to enthuse.

What is the purpose of the farm orchard? If I understand it corectly, it is to furnish fruit for the use of the family for as long a period during the year as possible. It does not consider the sale of any fruit, or at least only a small amount of surplus. In other words, it is simply a supply for the home and not intended to bring in returns from outside sources. As every farmer should wish to place before his family just as good a quality of fruit as he would offer upon the market for his neighbor, it is to be expected that he is willing to give the orchard the the attention and care that will make such a condition possible This will necessarily include those practices which will give perfectly formed and developed fruit.

There is another point in the handling of the home orchard which we must consider in this connection. Unlike practically every other farm crop, the orchard is expected to give results year after year. No part of it is changed. The same soil supplies the food for the trees and in turn the same trees produce the fruit. You would not think of asking such a task from any other part of the farm or of any other plant. Our home orchard is quite comparable to some machine doing service in the field. In the first place it costs considerable to get one which is fitted to do the work which is to be required of it. Again, it must do the same work year after year the same as the machine. You would not think of running your binder year after year without oiling or repairing the worn parts. How about your orchard?

ABUSE OF THE ORCHARD.

What constitutes abuse of the orchard is a question which must be considered before any system of caring for it can be decided

upon. If present practices are such as will give the results expected of the orchard in the most economical way, then there is no need of a change or a discussion of other methods. I believe that the average home orchard in Wisconsin is operated at a loss to the farmer so far as the production of fruit is concerned. I further believe that the average farmer would be better off, from a monentary standpoint, if he would cut out his orchard and put the field into some other crop, unless he is willing to change his methods and give the orchard the care and attention which it deserves and demands.

Perhaps these statements will meet with adverse criticism and the reasons for such a belief will not be out of place at this time. Why is the average farm orchard operated at a loss? In making the above statement, it must be remembered that we were referring to the actual cash value of the fruit which is obtained from the area devoted to growing trees and not to returns from other crops which are grown in the orchard. The ordinary apple orchard in Wisconsin produces on an average a crop once in three years. In seasons of apple crops, from fifty to seventyfive per cent of the fruit is destroyed or injured by codling moth, curculio and apple scab. The plum orchards give even poorer results. Brown rot and curculio have become so prevalent that a plum crop is now the exception rather than the rule. Owing to these conditions the returns from the orchard is very small. Areas devoted to these crops then, under present methods, are not bringing in the returns they would if devoted to other crops.

But let us go a step farther. Suppose that the orchard is being cropped. Does it pay even then to have the fruit trees? While this is a much harder point to decide than the former, I think even in this case the answer would be negative. Consider the small return from the trees, the reduced crop which is produced under an average sized tree when a crop is being grown in the orchard, the extra time and labor expended in plowing, harrowing and cultivating around them, and I believe you will reach the same conclusion. If then, the deductions made above are correct would the farmer not be better off from a monetary standpoint if he eut out his trees and bought his fruit?

Perhaps this is an odd argument to present before a horticultural society which has in mind the extension of fruit growing in the state, but you must remember that I am discussing this, by

SUMMER MEETING.

your secretary's instructions, from the standpoint of the busy farmer. The point I have been trying to make is this; the average farm orchard as it is operated today is a failure; the cause of its failure lies in the methods employed in its culture, and, unless the busy farmer is willing to give enough time from his other labors to care for his orchard better in the future than he has in the past, he will save money by giving up his halfhearted attempt and letting his neighbor grow fruit for him.

I desire to place myself on record as being in favor of the farm orchard conducted on right principles. While it may not be the most economical way of securing fruit for the home, I believe it can be made of value not only from the more aesthetic side, but from a monetary consideration as well. In these right principles J would include for the home orchard as well as for the commercial, all those principles pertaining to the various phases of culture,—spraying, pruning and cultivation. It is because I believe them all as essential to successful home orcharding as to a commercial project that I stated in the beginning that the line between the two is not as clearly drawn as is sometimes thought. As cultivation is the phase of orchard culture that has been assigned to me I will leave the others to other speakers.

CULTIVATION.

Cultivation of an orchard may mean any one of three things: clean culture, lack of cultivation, or cropping. Clean culture in the ordinary commercial orchard means working the soil until the latter part of July, followed by the sowing of a cover crop. Lack of cultivation includes those cases in which the sod is never disturbed. Cropping includes the raising of crops in the orchard. They may be hoed or cultivated crops or those which receive no tillage. Cultivation as now practiced in the home orchards of the state comes under one of the last two classes. In order to solve this problem of cultivation we must try to determine which of these three systems is the best. This done, we must then determine whether or not that system is advisable for the home orchard.

Within the past few years there has been considerable discussion as to the best methods of handling the commercial orchard. These discussions have brought about the carrying on of experiments to determine whether or not there is any very marked difference between the various systems. While the experiments

have been based upon commercial orchards, nevertheless what is valuable for obtaining the best results from a commercial orchard would be equally as beneficial if applied to the home orchard. I do not mean to say that the practices of the commercial orchard are always advisable in the home orchard, but that the principles applying to one apply equally as well to the other.

As the greater number of our home orchards are in permanent sod, let us first consider the advantages and disadvantages of this system. There are practically as wide differences under this system as there is between sod and clean culture. In order not to be misunderstood, we must consider some of these differences in detail. The majority of farm orchards which are in sod are made to serve two purposes. They are supposed to bear fruit and at the same time furnish pasture or a crop of hay. A great many farmers who practice this system when questioned upon it, inform you that some of the best horticulturists of the country recommended keeping the orchard in sod. While I admit this statement. I maintain that the farmer has drawn the wrong conclusion. The recommendations do not fit his case, for no good horticulturist recommends keeping the orchard in sod and at the same time taking from it the grass which grows there for pasturage or hay. This practice is beyond the pale of good horticulture and need not be considered further only to say that being under this system the large majority of home orchards are subjected to the worst treatment, so far as cultivation is concerned, that could be devised for them.

THE SOD-MULCH SYSTEM.

I have said that no good horticulturist recommends the system just outlined. How then has come about this mistake of thinking such is the case as is so frequently done? It is the outcome of a system largely promulgated by the Ohio Experiment Station and known as the Hitching's or sod-mulch system. The details of it vary somewhat but briefly are as follows: The orchard is left in sod permanently. All the grass grown upon it is cut and either left where it falls or else is gathered and placed around the base of the trees as a mulch. In the last few years, it has also been made to include the placing around the trees of additional litter such as straw or hay which did not grow on the orchard.

This system has been compared with the clean culture system

SUMMER MEETING.

by which I mean as previously oulined, cultivation the first part of the season followed by a cover crop, and has been found to be much inferior in many respects. The growth of the trees in cultivated orchards is much greater, the general health of the trees better, and the crop returned not only larger but much superior in quality. In seasons of drought, the well-tilled orchard suffers much less than one under the sod-mulch system. This has been very noticeable during the present season in the orchards at the Experiment Station. Last year when dry weather prevailed during August, the amount of fruit falling from the trees was much greater in the sod than in the cultivated orchard.

Another important factor in comparing the two systems which is often overlooked is the one of insect pests. Our experience at the Station has been that insect pests are much more numerous in sod than in cultivated orchards. The prevalency of blight also deserves attention. This season should be a favorable one so far as the appearance of blight in the sod orchard is concerned, if the oft repeated statement that there is less blight in sod orchards is correct. We find, however, that blight is much worse in the sod than in the cultivated orchard.

There must be some good features of the sod-mulch system or else it would not be used. Probably the most important of these to the Wisconsin grower is the fact that the fruit of a sod-mulch orchard matures from one to two weeks earlier than when grown under cultivation. The color is heightened which is also of considerable importance. After all has been said for and against the sod-mulch system, it has a place in fruit growing in this state, and that is on locations which are so steep that washing becomes a serious matter when the soil is cultivated. Outside of these instances I do not favor the sod-mulch for the home orchard. The temptation for the average farmer to haul off the hay is too great to be resisted and as cultivation secures larger and better returns with only a slightly additional cost it is to be preferred.

After considering the various systems we have arrived at the same conclusion that the commercial orchardist would in sizing up the matter. Clean culture, with a cover crop, is the best system of orchard cultivation. We must now consider the second half of our question: Is this system advisable for the home orchard? From the standpoint of the busy farmer, the time spent in the various operations of orchard cultivation at the time when

other farm work is pressing, and for which only the small additional amount of fruit coming from a small orchard is the return is time spent at a loss.

ORCHARD CROPPING.

We have condemned the present sod orchard with its pasture or crop of hay. We have decided that the sod-mulch while adapted to certain special conditions is not the best system for a majority of our orchards, and that the clean culture method is not adapted to the home orchard. There is but one system left to which we may turn for a solution of this problem—cropping the orchard.

At the beginning of this discussion, I said that the orchard might be compared to your binder. Cultivation is to the orchard what oil is to the machine. Without oil the machine is soon valueless. Without cultivation the plant food in the soil is not furnished rapidly enough to the plant to enable it to give the best results of which it is capable. We must have cultivation if we are to get all out of the orchard that we should even if there need be some sacrifices in other respects. Sacrifices, however, are not necessary. Perhaps you could not afford a binder if you could only use it for cutting oats, but when you add barley and rye, it then becomes a good investment. The same is true of the orchard. While it may not be advisable to cultivate the home orchard for the fruit alone, when we can use this same cultivation as a means of producing other crops, it then becomes worth while.

When one advises cropping the orchard, he is approaching dangerous ground for there are so many chances of being misunderstood. I have already condemned one form of orchard cropping, and now to recommend another might appear to be inconsistent. Such is not necessarily the case. A binder in a field of oats is no more out of place than in a field of rye. However, if a farmer attempted to harvest his corn with an ordinary binder you would immediately think that there was something wrong. While certain crops are out of place in the orchard, there are others which are not only permissible, but often advisable. The growing of grain crops in the orchard is to be condemned just as severely as the growing of hay. On the other hand clean culture crops, most vegetables and small fruits are allowable. In a young orchard, corn and potatoes may be grown if the rows are kept some distance from the trees. As the orchard reaches fruit bearing, these crops should give way to others.

The subject assigned me included the fruit garden as well as the orchard, but I have purposely avoided saying anything about the cultivation of the fruit garden. So far this paper might be considered more destructive than constructive. In building a new building, it is sometimes necessary to tear down an old structure before you can begin the new. This has been largely the task I have had today. My new structure is to be built upon the foundation of the home orchard and fruit garden as a unity rather than two separate things. In other words I offer as the solution of the problem of the cultivation of the home orchard and fruit garden, the uniting of the two. Plan your orchard, select the varieties, set the trees, but all the time keep in mind that between the rows there are to be rows of small fruit, red and black raspberries, blackberries, currants, gooseberries and strawberries. Plan the rows so there will be one or two rows of small fruit between each two rows of fruit. Leave plenty of space to cultivate beteen the trees and small fruits, and between the rows of small fruit. If the orchard is so large that too much small fruit is needed to fill in between all the rows use the surplus for vegetables.

Cultivation now assumes a new phase. The small fruits must have it, therefore the tree fruits are not neglected. The task is a small one because the fruit plantation is compact. The benefits are so great that now there is sufficient to be gained that some of the other work can be put aside for the short time it takes to cultivate the orchard. Not only have you gained in the matter of cultivation, but in spraying and the various other fruit plantation operations as well.

There is one thing which we must not forget in this system, however. We are drawing largely upon the plant food in our soil. By dropping out the cover crop of the clean culture system, we have lost the means of getting vegetable material into the soil which is a very important matter. The supply of food and vegetable material must not be neglected. Barnyard manure must be used to supply any deficiencies, and the soil must not be allowed to become depleted before the work of restoration is taken up.

If the farmers of our state will follow some such plan as outlined above in the handling of their home orchards and fruit

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plantations, the matter of cultivation will be so insignificant in comparison to the returns secured that orchard cultivation will no longer be looked upon as a luxury to be indulged in only by the commercial grower, but a necessity to be used by every man who grows fruit.

Prof. Moore: In connection with this paper, I have here worked out a plan for a one-acre farm orchard. This orchard contains thirty-six apple trees, four pears, eight cherries and twelve plums; it also includes currants, gooseberries, raspberries, blackberries and strawberries, all the small fruits that any one grows. The trees are set thirty feet between rows, small fruits are set in proportion.

Dr. Loope: How long are the rows?

Prof. Moore: About 295 feet.

Dr. Loope: Do you mean to plant raspberries and strawberries between the apple trees?

Prof. Moore: Yes.

Dr. Loope: Do you think you can do it successfully, do you not think they would draw too much from the ground?

Prof. Moore: That would depend on how close you set them. Of course the distance is to be considered. In fact, if the trees covered all the soil, then it would be necessary to remove the berries. The idea is, to get cultivation for your orchard, as well as for your small fruits.

A Member: The best success we ever had, we grubbed out oak trees and set apple trees and they are doing well. We planted them twelve to thirteen years ago and they are full of apples now. I have had quite a little experience with an apple orchard forty-six years old. We started a team plowing as though there were no apple trees there, commenced in the middle, when we got to the tree, we used one horse and set the plow so that we furrowed up to the row, then we have three men following up to spade one furrow and throw it right over; then when we come on the other side of the apple trees, we roll it right up and there are no back furrows.

Prof. Moore: This morning there was one question brought up which I thought might be discussed this afternoon. Mr. Hager said that farmers would not follow good practice in regard to their home orchard. Well, that may be true; I will meet

VARIETIES

APPLES - 0 25x30m SHIELDS CRAB ARCZIC CRAB POWERS CRAB TETOFAKY 2 RED ASTRACHAN 2 LOWLAND RASPBERRY 2 SWEET RUBBETT DUCHESS . . 5 WEALTHY FAMEUSE TALMAN FAMEUSE O NEWELL 0 WINDSOR NORTHWESTERN .3 WHITNEY COLUMBIAN SHIELDS CRAB ARCTIC CAMB POWERS CARS PLUMS-0 25x30m 0 2 BERCKMAN 2 QUAKER 2 SURPRISE 4 ----CHERRIES - @ 25x 30Fz 3 EARLY RICHMOND 5 MONTMORENCY PEARS - . 25x30 PR 2 FLEMISH BEAUTY 2 KIEFFER GRAPES - * 12 Fr. ORLEANS 4 DIAMOND 5 MOORES EARLY 5 DELAWARE OF BRICHTON 7 WORDEN OR CONCORD GURRANTS - X 4FR 5 PERFECTION SUMMAR 4 WHITE GRAPE GOOSEBERRIES- + 4 FY 5 INDUSTRY 5 PEARL BLACKBERRIES - . SFT. 10 ELOORADO 5 ANCIENT BRITON BLACK RASPBERRY - ASTAN 7 PLUMB FARMER 5 NEMAHA RED RASPBERRY - 4 PE 7 COLUMBIAN

TALMAN WINDSOR NEWELL NORTHWESTERN 0 0 0 0 0 0 0 - 215 CLANTE 1/2 X3" VARIETIES TO CHOICE VEGETABLES FLEMISH BEAUTY KIEFFER EARLY RICHMOND MONTMORENCY . YEGETABLES O WYANT BERCKMAN A QUAKER A SURPRISE A 0

LOWLAND RASPBERRY

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WEALTHY

MOORE'S EARLY

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PERFECTION W GRAPE INDUSTRY PEARL ELOORADO A BRITON PLUMB FARMER NEMANA

SWEETRUSSET

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DELAWARE

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WHITNEY

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CUTHBERT

1 0

		SUMMARY
	SUGGESTIONS FOR	32 APPLES 4 CRAB APPLES
*	ONE ACRE	12 PLUMS B CHERRIES 4 PEARS
LE TOEND OF ROWS		9 CURRANTS
PENCE TO OUTSIDE ROND	WISCONSIN	10 GOODE BERRIES 15 BLACK BERRIES 12 BLACK BERRIES
LE TINCH = 20FEEX	FRUIT PLANTATION	17 RED RASPORARIES 275 STRAWBERRIES

Plat prepared by Prof. J. G. Moore.

145 × 295 FT

10FT. FROM FER

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12 1/2 FT FROM

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that objection in this way. I would like to ask how many farmers who were not growing orchards five years ago in Wisconsin have started growing? You would not need the fingers of one hand to count them. Now, while this may be a little out of place, we have come to this proposition, that unless we take care of our fruit better in the future than we have in the past, that the Wisconsin farm orchard is going just exactly the same way as the Michigan farm orchard, and that is that with the lack of cultivation and lack of proper handling today, the Michigan farm orchard is passing out; in ten years there will be very few good farm orchards in Michigan. Wisconsin is going just the same way. Perhaps we cannot get every farmer to take up a system of this kind and cultivate, but just as soon as this farmer sees the benefit of cultivating fruit trees, just as much as he sees the benefit of cultivation of his corn, he is going to cultivate it. We go into a district and spray; we can get but one man to spray, but as soon as his neighbor sees he is getting results, then he will spray too.

A Member: If you spray trees pretty well before the berries get ripe, if you have strawberries in the rows, you are apt to get some of the poison on them.

Prof. Moore: You would have to eat several bushels of berries in order to get enough poison to hurt you.

The President: I want to say something in regard to this mixing up so many things in the orchard. A few years ago I noticed in Mr. Franklin Johnson's blackberries that there was quite a difference in the rows. He had planted blackberries eight feet apart and strawberries between; the strawberries lasted long enough so that they had a decided effect on the blackberries, the blackberries showed the bad effect of having the strawberries in between, and I am not quite sure if you try blackberries and raspberries in your orchard long enough to have it worth while, that you would find that they get badly in your way in orchard work.

Prof. Moore: Do you think the bad effect upon the trees or upon the small fruit would be as great if the small fruit was planted in the orchard, as it would to have both small fruits and orchard setting in sod?

The President: I will answer, if you get up a man's enthusiasm sufficiently to cultivate his orchard, why in the world make it so much harder to do it as to put those things in, when he can do both better by having them separate, and he could cultivate in his orchard beans and various crops that could be got rid of when he wanted to, instead of holding them in the ground longer than he wanted to hold them.

SPRAYING THE FARM ORCHARD.

PROF. J. G. MILWARD.

To facilitate a prompt discussion of essential details, the writer has in mind a mixed orchard of about 300 bearing trees. It is not intended to make any comparison between commercial and farm orchard spraying, as obviously, the work in the farm orchard is merely an application of methods which have been found profitable on a commercial basis. From the size of the orchard selected, the small fruit grower should be able to make the necessary applications to his own conditions.

What will be the cost per acre of spraying 300 bearing trees? An itemized statement prepared this season from spraying six acres of apples is given.

Bordeaux mixture formula:		
Blue vitrol	8	lbs.
Lime	10	lbs.
Water	100	gals.

The cost of 100 gallons of Bordeaux mixture equals approximately sixty cents. As indicated in the statement eight pounds of Arsenate of Lead is added which brings the total cost of 100 gallons of spray mixture up to \$1.50. The necessity of giving attention to the dates mentioned is important, inasmuch as they cover the season when the common orchard pests are at work on the trees. The statement given makes full allowance for labor and expense, and if the fruit grower is not willing to make the investment indicated (relative of course, to his own conditions) he had better not attempt orchard spraying.

1st	application.	(May	6)		250	gals.	 	 	 	 		\$1.50
2d	application.	(May	18)	poison,	300	gals.	 	 	 	 		4.50
3d	application.	(June	2)	poison,	600	gals.	 	 	 	 		9.00
4th	application.	(June	21)	poison,	600	gals.	 	 	 	 		9.00
5th	application.	(July	14)	poison,	6,00	gals.	 	 	 	 		9.00
Tota	al labor 4 da	ys for	2 me	n and t	eam.		 	 	 	 		20.00
											-	
	Total cost						 	 	 	 		-53.00

SUMMER MEETING.

Cost of spraying per acre, five applications	8.83
Investment in machinery.	A+0 00
Large size harrel nump	\$18.00
20 feet 1// entre heavy has	6.00
30 reet, 1/2 extra neavy nose	0.00
1 triple Vermorel nozzle	2.00
1 extension rod, 10 ft. bamboo	1.50
Total	\$27.50

Note. A reasonable discount on the above may be had from most firms on a full order.

Utensils. Most fruit growers begin work with too few utensils for mixing. Where barrels are used, at least five should be available with a capacity of 50 gallons each. Stock solutions of both blue vitrol and lime should be prepared as directed, and three barrels should be used for mixing purposes. Provide either a burlap or brass strainer and two cheap, ten-quart mixing pails. Where access to water flow through pipes is available, this system of mixing could of course, be extended to larger tanks, and the gravity system of filling used as a substitute for the dipping process. However, these methods apply more to commercial orchard spraying. Easy access to a good water supply reduces the labor of mixing.

Mixing Details. Where 500 gallons of spray mixture is required for an application prepare as follows:

The day before spraying suspend forty pounds of blue vitrol in forty gallons of water. Hang the sack of blue vitrol high up in the water or it will not dissolve. This makes blue vitrol stock solution, one gallon of which equals one pound of blue vitrol as per formula.

Slake fifty pounds of fresh stone lime in another barrel taking care not to "burn" or "drown" the lime. Let stand as thick hot lime for one hour, stirring occasionally. Dilute to one-half barrel. This makes lime stock solution, one gallon of which equals two pounds of lime in the formula.

To make 100 gallons of Bordeaux mixture as per formula given above pour eight gallons of blue vitrol in one 50 gallon barrel and fill with water. Pour five gallons of lime stock solution in another 50 gallon barrel and fill with water. Strain at the same time equal amounts of these two solutions through a burlap sack, into a clean barrel. This makes the Bordeaux mixture. The mixture may then be poured directly into the spray tank.

Combination Mixtures. From the statement given above poison was added in four of the five applications. The poison is added to the mixture just before starting for the orchard. Arsenate of Lead should be added at the strength of four pounds per 50 gallons of spray mixture. If Paris Green is used, 12 to 14 ounces should be added to 50 gallons of mixture. The labor involved in reducing the Arsenate of Lead to a thin consistency is minimized if large quantities are reduced at one time.

Field Methods. Labor in mixing may be reduced by mounting the pump in a 75 or 100 gallon tank. The outfit may then be hauled conveniently on low trucks or upon an ordinary lumber wagon. If plenty of labor is available, two leads of hose 25 feet long may be run from a large sized barrel pump. In most cases, however, a single lead of hose with a triple nozzle will be more desirable. In this case, one man can do the pumping and drive the outfit. To insure rapidity and thoroughness in the orchard, the following precautions are necessary:

1. Attention must be given to thoroughly strain all spray mixtures and to keep the tank, pump, and pipes free from scales. Grit in the spray mixture causes delay and injures the efficiency of the spray nozzles.

2. The spray pump must be kept at the highest state of efficiency. The cylinder should be repacked each season, and after each spraying the pump should be cleaned and oiled. The corrosion and wearing of spray pumps may be minimized by this treatment.

Attention should be given to secure a high pressure spray. Coarse nozzles are wasteful and do unsatisfactory work The mixture should be forced through fine mist nozzles at high pressures. Good Vermorel nozzles require at least fifty pounds pressure to spray economically.

Standard Spray Mixtures. Notwithstanding the development of the insecticide and fungicide business, it would not be advisable to recommend a very wide selection in the use of spray mixtures. Where orchard spraying has extended farthest, the standard wet Bordeaux mixture still remains the most efficient fungicide. Among the insecticides, Paris Green and Arsenate of Lead are as yet most generally used. Some growers have tried the homemade poisons, including Arsenate of Lead, Arsenate of Lime, and Arsenate of Soda. There is a deep seated



State Fair Exhibit, 1909.



Some of the barrel pumps shown at the State Fair.



SUMMER MEETING.

prejudice against home made poisons, however, due largely to the labor involved in preparation. It is more advisable for the average orchardist to purchase commercial prepared poisons. As yet, we have no efficient substitute for the standard wet Bordeaux mixture. However, Experiment Stations are testing the fungicidal value of lime sulpher mixture and perfected results on this work may be expected in the near future.

WHAT THE FRUIT GROWER SHOULD KNOW ABOUT FRUIT DISEASES AND INSECTS.

Let us line up the list of important pests, both fungus and insect, which the Wisconsin orchardist has to control. *Insects.* The codling moth, apple and plum curculio, gouger, tree aphis and oyster shell bark louse. *Fungus diseases.* Apple scab, bitter rot, apple rust, plum brown rot, shothole fungus, and other less important diseases. Fortunately, most of these pests are controlled by the combination mixture (Bordeaux and Arsenate, either Paris Green or Arsenate of Lead) mentioned in the itemized statement above.

In reference to the above mentioned pests, there are some current opinions which probably the orchardist should not know. In some sections the fruit growers refuse to conceive the true practical relation of these microscopic pests to the evidence of injury which is open to the naked eye. There is yet a tendency to throw up the hands and hold that the apple scab and rot is merely a result of weather conditions, and beyond the reach of artificial means of control. The relation of a practical understanding of these things is important to success in orchard spraying. The busy fruit grower is not expected to be an entomologist or pathologist, but he should accept the results of practical horticultural investigations along these lines in preference to the theories of irresponsible parties.

In the application of the principles just mentioned, most orchardists usually fail to continue spraying until the danger from insects and diseases has passed. The approximate dates which are recommended for the application of spray mixtures are timed in accordance with the chances of reaching the orchard pests when they are most readily controlled.

What percentage of fruit harvested in Wisconsin is sound? The writer has taken occasion to examine the output of several apple orchards in the state, and has often found as high as 75 per cent of the crop infested with worms. Add to this injury that from scab and rot also, and any informed horticulturist will agree that the loss is sufficient to warrant the adoption of economical methods of control.

As opposed to the conditions just mentioned, the writer has seen orchards which have yielded unsound fruit, turned by a system of spraying into profitable orchards, when as high as 90 per cent of the crop was sound. It should be remembered that the evidence of benefit is not alone indicated by the superiority of the fruit, but also by the increased health and vigor of the trees.

Before closing, it is advisable to enumerate several problems inclusive under this discussion, but which have been purposely omitted because they have been thoroughly handled in standard bulletins and reports. These include a list of formulae for spray mixtures; detailed discussion upon spray machinery; special reference to scale insects. Upon these points, and in fact the whole question, horticulturists are urged to avail themselves of the reports and bulletins of the Horticultural Society and the Agricultural Experiment Station. Attention is also directed to the fact that orchard spraying is in progress in the State under the system of the University Extension, and it is especially intended that Wisconsin horticulturists should keep in touch with this work. There is room for the extension of economical orchard spraying among the horticulturists of Wisconsin.

Mr. Tiplady: Are these new tree bands used to any extent in the orchards, to keep insects from crawling up the trees?

Mr. Milward: I have never seen them used.

Prof. Moore: The tree bands are good for but very few insects, but there is no object in using the bands because you have to spray for codling moth and get the canker worm anyway. How much lime do you use?

Mr. Milward: We use eight pounds of blue vitriol and ten pounds of lime to 100 gallons of water.

Mr. Smith: You said something about the kind of nozzle one should use with a high or low pressure.

Mr. Milward: Yes, you can get various degrees of spray, fine or coarse. I said if you use the coarse nozzle it sprinkles it on the trees instead of spraying. You cannot use low pressure and

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do effective work. You want high pressure, a fine spray, instead of a coarse nozzle and spraying with low pressure.

Mr. Kellogg: How are you going to prevent clogging?

Mr. Milward: There is a strainer inside of the spray tank. Another thing is to clean out the spray tank; if you allow scales to form inside of your spray tank you will have trouble. See that there are strainers from the suction pipe to the pump.

Mr. Kellogg: Is there any danger of getting too much Paris green?

Mr. Milward: No. sir, not with the Bordeaux mixture, if you are anywhere within reasonable limits; you can put in plenty of lime. I never saw an injury from Paris green.

A Member: How much do you use?

Mr. Milward: I use from 12 to 14 ounces to 50 gallons.

A Member: Would you want to give the impression that you use a pound of Paris green,—you say you never saw any injury, do you want to give the impression that you use as high as a pound?

Mr. Milward: Yes, I have used as high as a pound with the Bordeaux mixture.

Mr. Reigle: I would like to suggest one thing I did not hear Mr. Milward mention in reference to nozzles, and that is the swivel nozzle. You want to get one that will turn so that you can stand at one side of the tree and turn it so as to throw it under or on the side of the tree.

Dr. Loope: Do you ever find bronzing of apples from spraying?

Mr. Milward: You mean an attack similar to that? (Exhibit-That brings up an important question. In ing specimen.) spraving orchards some seasons. I have seen that appearance on apples, where there has been an application of Bordeaux mixture: I have investigated the question quite thoroughly, and I think undoubtedly that russeting of the skin arises from two causes: one, that it is a mechanical injury of the spray mixture being thrown against the tender skin of the apple early in the season. When the apple is growing very rapidly, and especially some of the varieties such as the Longfield, if you use the power sprayer, and it is more noticeable where power sprayers are used, and force the spray mixture against the apples, you will find some that are affected in this way. It is partly due, perhaps, to chemical causes; authorities disagree on that, but I think it is

a combination of the two. It is objectionable, but it is not nearly as objectionable as the scab would be.

Dr. Loope: I have used the power sprayer at a pressure of 130 to 160 pounds, and I have used also the barrel spray, and often with the barrel spray I found more of that brown than with the other.

Mr. Milward: It will be different in different seasons. I think the matter of pressure has much to do with it. Also a difference in the skin; there seem to be some varieties that are more susceptible than others.

The President: As Mr. Herbst is not here, I will ask Mr. Smith to speak on "The Vegetable Garden, One Side of the Question."

The Secretary: Perhaps it would be better to hear from the other side first. When I put Mr. Ingham down on the program, I scarcely expected he would be here, as he lives in Pennsylvania, in fact, I knew he would not be here. I was attraced by an article that he had writiten for one of the agricultural papers, a rather unique presentation of the subject of the farmer's garden. There are some rather startling facts in this brief paper. I want to say, I am not in any sense responsible for them, any more than I am responsible for Prof. Moore's argument on the farmer's orchard.

WHY FARMERS DON'T HAVE GOOD GARDENS.

J. W. INGHAM, Pennsylvania.

It would give me great pleasure, if possible, to meet the members of the Wisconsin State Horticultural Society at La Crosse in August next. Societies, like corporations, when properly conducted, do much good. The work of many minds, and numerous hands, can accomplish more in a special field than the labors of a few. The discoveries, and improvements of each member, soon become the property of all, and all are energized, psychologized and stimulated to greater efforts by contact with each other. The reports of these meetings and discussions are widely published, are read, enjoyed and remembered by thousands who cast the college bulletins aside unopened.

It is generally agreed that for some reason, the particular branch of horticulturee which consists in the care and cultivation

of gardens, by the majority of farmers, is not practiced successfully—that the majority have poor gardens and the majority do not deny it. Some writers have ridiculed farmer's gardens by saying they had to take a scythe and mow the weeds before they could find their vegetables.

The late Waldo F. Brown of Ohio, said: "A majority of farmers fall below their privileges in not having a good garden." Of course they do. They have the privilege-there is no law against it, either human or divine, then why don't they have one? They have the privilege of going to the seaside, or some fashionable summer resort of the wealthy during the heated term, to obtain the pleasure and comfort to be there obtained. Then why do they not go? The simple reason is they neither have the time nor the money to spare. Some farmers may be in debt for their farms, or improvements, and must raise money, and all are anxious to raise good field crops to obtain funds to erect new buildings or put down some tile drains. Good field crops are absolutely necessary to profitable farming and must have the tillage at the proper time, and as often as required to secure a good yield. The field crops are the farmer's main dependence. the gardens are not. Perhaps some one will dispute me here by saving that the garden is the most profitable piece of ground on the farm and pays the best for the labor expended and the manure put on it. According to my experience a family will eat nearly as much bread, butter and meat and drink just as much tea and coffee and consume twice as much sugar when they have good gardens and plenty of pie plant, currants, gooseberries, raspberries, strawberries and grapes. A good garden is a luxury, not a necessity. Perhaps someone will say that a good garden pays in saving doctor's bills. There is no proof to support it. There is more sickness during the garden season than in the win-Summer complaint originates from the garden. That ter. farmers don't have good gardens is evidence that good gardens do not pay in dollars and dimes. I have had a long experience in gardening and farming and I say it deliberately and without fear of successful contradiction that I can plow the ground, plant and tend the corn on ten acres with less labor than I can plant and tend a good half acre garden.

My land will produce 50 bushels of shelled corn per acrecall it only 48. Half the stalks will pay for cutting up with the corn harvester; one-eighth will pay for husking; half the stalks will pay for drawing and shucking, leaving me 42 bushels per acre clear or 420 bushels on the ten acres, which at 50 cents per bushel will bring \$210.00. If we deduct what the land would rent for—say \$60.00 I would have \$150.00 left for my labor and team work. How much clear money would I get for my labor and seed put on a half acre garden? Unless I lived near a village where I could dispose of part of the produce which would otherwise go to waste, I would get nothing that would pay taxes or store bills.

A wealthy neighbor once hired an English gardener to make and tend his half acre garden and it was all the work the man did. Of course the garden was a good one, but it cost \$180.00 for six months work. The wealthy neighbor could have afforded the luxury of an excellent garden but it seemed to his economical mind like paying too dear for the "whistle" and afterward he had no better gardens than his poorer neighbors, but I think he made a mistake. I believe in having as good a garden as a farmer can afford without neglecting his field crops.

Fruit trees should not be placed in the garden. They soon grow so large they injure the vegetables and berries by their shade, and also by the extension of their roots rob their smaller neighbors of the moisture and fertility they need for perfect growth. My father had cherry trees, peach trees and dwarf pear trees set round the outside of his garden and they damaged it greatly. If farmers keep chickens they should certainly have a picket fence or some fence that will keep the chickens out. An old hen and chickens can do a great deal of damage in scratching the beds in fifteen minutes. The mischief they do is not easily repaired and is trying to the owner's patience.

I have no doubt the well informed farmers of Wisconsin very properly lay out their gardens in the form of a long parallel, plant their vegetables in rows far enough apart to cultivate between the rows with a horse and that they have a bed of asparagus on one side of the garden which requires but little labor to take care of and provides such tender, delicious and healthful food in the early spring.

The President: We will now call on Mr. Smith.

Mr. Smith: To begin with, I should say no farmer, unless it might perhaps have been Brigham Young, would have use for a half acre garden for his family. The last two seasons I have been experimenting with a farm garden up at Ashland. Went

SUMMER MEETING.

up to Ashland on the first of August, turned under a sod which, most of it, had never been plowed before, composed of June grass and timothy; the ground was so hard that we had to ride the plow in order to get it under at all, and got it in some places four inches deep and in others not so deep. That is where I set a strawberry bed and had good strawberries this season. Only a few rods of ground are necessary to produce the ordinary garden, furnishing vegetables in sufficient quantity for a good sized family. The suggestion made to put them in long rows is good I think, also the suggestion to keep them out of the orchard is good.

I believe Mr. Ingham says good farmers, usually do not have much of a garden: that is true to a certain extent, but the farmer's wife quite commonly has a garden. It is not perhaps model or ideal. and I might go further and say that that farmer does not realize when he comes in to a good dinner, how much of it comes out of that garden; he forgets that two or three things on his table his wife went out and picked out of the garden. I have now in Ashland a few hills of cucumbers, beets, carrots, cabbages, tomatoes, corn, squash, etc., when I think the conditions were, I might say, worse than almost any farmer could pick out on his place. The ground was a good deal like a strawberry bed, but where it was plowed it was a hard, white and some red clay that gets as hard as this floor, did not take very long either, and it gets hot; yet even under those conditions I have done about all the work in caring for those things in comparatively few evenings after supper. To be sure the sun does not set up there and it does not get dark until pretty nearly nine o'clock in June and July, I have come in ten minnutes to nine several times from setting plants in the garden, so we have long afternoons, but only a few hours' work per month are required to take care of a little patch of ground that will produce all of the small truck that the average farmer needs. A great deal has been said here about the farmer not having time for taking care of his garden, but it is simply an excuse, not a reason. The reason is that he likes to drive his team, likes the big fields a great deal better; the average farmer thinks it is frittering away time to work in the garden he would rather work outside in the larger fields. As I said, only a few hours' work per month during the first two or three months of the season is all that is

necessary to grow enough vegetables for any ordinary family. Perhaps I have said all I need to say on that subject.

The President: As the other fellow is not here to answer, we will not need to take a great while in discussing it, but still the subject is open for anyone who wishes to speak on it.

Mr. Kellogg: There is a great deal of truth in Mr. Ingham's paper, and what Friend Smith says is all fact, there are both sides to the question, but our friend Daniel Huntley, one of our former members of this Society who lived at Appleton, had his garden arranged so that as he went out from work at noon and out to work in the morning, he went out with his two-horse cultivator right down through his garden, had long rows, which he cultivated as he went out and as he came back to dinner and came back at night. He had a garden that did not cost much and it was worth something.

THE FARM BEAUTIFUL.

MR. JOHN TIPLADY.

The farm to be beautiful from a financial point of view must contain broad areas of well-developed land of growing crops and healthy herds of cattle and sheep, etc. The success of the farmer depends upon his ability to produce these conditions and put them on the market at the best possible price, meet his obligations, and have enough money and effort left to beautify his premises from an aesthetic point of view. To accomplish this he must have some knowledge of the many trees, shrubs, and vines best adapted for this purpose. How often we see trees, shrubs and flowers dotted all over the front yard or planted in straight rows across the premises. Both methods must be discouraged if not abandoned and the plantations arranged with tasty effect. A pleasant view should not be obstructed by any trees however beautiful, neither should any objectionable feature be left in sight of the sitting room windows. The judicious planting of trees and shrubs will bring about satisfactory results in either case. Where a quick growth is desired to screen the out-buildings some of the fined kinds of poplar, willow or basswood may be used in place of the box elder or soft maple, both of which have their place in the world but this is not in the front yard of an up-to-date Wisconsin farmer. I consider

the elm the most satisfactory tree for the farmer as well as a city tree and we have as many as thirty-two (32) varieties to select from. From the American white elm of historic fame and in all shapes and forms,—spreading and compact—large, small, plain leafed or curly, variegated, golden, purple or green, making the matter of selection difficult if not confusing. The average life of the elm is 250 years so that extreme care should be taken in regard to its permanent location.

The maple claims 2nd place in my estimation as a shade and ornamental tree for the front yard and of this genus we have at least 16 varieties to select from. Most familiar and useful of these is the hard or sugar maple of utility as well as beauty. The soft and weeping maple is included in the above list of varieties but where a little tinge of color is desired the red or purple leafed kinds should be carefully arranged and planted, adding the appearance of wealth to the collection and giving a color so pleasing from a distance. This variety is known as acer Schwedleri, an improved form of the Norway maple, of compact form and easy to transplant. Other varieties of maple which may be used in the transformation of the farm grounds are those whose foliage is either golden, spotted, or marginated or whose form is either pyramidal, spreading, weeping or dwarf. Conspicuous among the latter is the highly colored and deeply cut foliage of the Japanese varieties which. on account of their tender nature however do not come under the head of useful trees for the farm grounds. One of the most attractive features of the maple, a feature seldom if ever superseded by any other kind of tree is its deep and wonderful color effects during Autumn. It seems to remind us that the summer is past, that their duties are ended for another season and that in a short time the blasts of snowy winter will be upon us.

Important in the list of shade trees is the ash, two varieties being indigenous and well known subjects to the Wisconsin farmer, namely fraxinus Americana, The white ash and fraxinus sambucifolia The black ash, the former deriving its name from the color of its wood and the latter from the resemblance of its foliage to that of the elder (Sambucus). These two varieties of ash however drop their leaves quite early in the season and are superseded by a European variety "fraxinus excelsion" whose foliage hangs until killed by frost, making it a more desirable tree for lawn adornment, etc. This

variety can easily be identified by the jet-black appearance of the dormant bud. Any of the following varieties of poplar; silver, golden, Carolina, or pyramidal may be introduced into the plantation with good effect but not the Lombardy, whose shade is too scant and whose life too short to be of real value to the farmer. On my visit to Salt Lake City I was surprised to find the entire area planted to this useless tree, already showing signs of mortality and condemned the selection of the followers of Brigham Young, but found upon inquiry that this was the only kind of tree they thought would grow under the existing conditions.

The mighty oak, so familiar to all of us and so often spoken of as a symbol of strength is worthy of a place on the farm grounds, but the historical oak of a century ago seems to despair civilization and yearns for the tangled forest, with its dense underbrush of hazel, dogwood and briar. Another variety however quercus Palustris or pin oak has been discovered which submits itself to our conditions and has proven itself a really valuable tree for the farm grounds.

In connection with the above list may be added the proverbial chestnut or buckeye, which if given plenty of room forms a symmetrical tree. When covered with bloom in early summer it is much admired and considered a very satisfactory tree, and very common on the grounds of European farmers.

Of the less attractive but useful shade trees the American linden or basswood justly claims a place in the plantation. Its large leaves and spreading habit highly commend it and immense quantities of honey are collected from its flowers.

To further elaborate a selection may be made from some of the finer kinds such as purple-beech, weeping birch, maiden hair tree, purple plum, flowering crab and a host of evergreens most attractive and costly of which is the Colorado blue spruce and its types.

Personally I do not favor planting many of the various pines and spruces around the home. They possess a certain amount of beauty and make good windbreaks but there is always a somewhat "cemetery" appearance that does not appeal to me except in that part of the country where evergreens prevail.

Possibly just as confusing to the farmer is a selection and arrangement of suitable shrubs for the premises. Prior to the date much has been said of the value of native shrubs as a front yard adornment so our thoughts may now be directed to some of the more desirous exotic or foreign kinds. Most useful and attractive of all possibly are the spireas, nearly all of which are of graceful habit, medium in size and possessing a marked variability in flower and leaf. Spirea Arguta and spirea Thunbergī are among the earliest to bloom both having pure white flowers during May and June. The variety S. Van Houtii is enveloped in a cloud of snowy whiteness. From the pink section may be recommended S. Bumalda, S. Billardi and callosa roseum, the variety S. Anthony Waterer being the nearest approach to red. Many of the spireas may be used to advantage as a hedge plant as well as for grouping.

The hydrangea should be included in every collection of choice shrubs and when properly grown present a magnificent sight either planted in groups or in the shrubbery. All three varieties should be included to prolong the blooming period. H. arborescens the native kind blooms the entire summer but is not so attractive as H. arborescens grandif. alba, a magnificent variety of recent introduction, whose blooming period is June and July, followed in August by the well-known H. paniculata Grandiflora. The blooms of the latter variety may be cut off at maturity and stored away for Christmas decorations.

The common lilac comes under the head of Syringa vulgaris of which we have over sixty varieties in purple, red, white, blue, ruby and intermediate shades. The blooming period can be lengthened by the addition of S. Persica, villosa Japonica and Pekinensis. The vulgaris hybrids come in double as well as single and are usually grown on their own roots to avoid suckering, but the Japanese forms are grafted on an allied stock, usually the Ligustrum or Privet.

Philadelphus, Tartarian honeysuckle, viburnums and weigelias should all have a prominent position in the shrub plantations. The old time privet "ligustrum vulgaris" is now superseded by L. Regalianum, Ibota and Amurense all of more graceful form and all perfectly hardy.

The purple and green varieties of barberry are always acceptable both having many interesting features in leaf, flower and fruit, besides their ability to stand abuse and look pleasant. They adapt themselves to all kinds of climates and conditions and when in full fruit early in winter form a beautiful con-

trast with the snow. Berberis Thunbergii the dwarf Japanese variety is used very extensively as a border plant. A new form of this variety has just very recently been introduced from Japan and will no doubt be accepted with the same grace as are other introductions from the Orient.

Climbing vines best adapted to the Wisconsin climate are by no means as numerous as the different kinds of trees and shrubs and may be divided into two classes, viz., self-supporting and non-supporting. Of the former ampelopsis Englemanii and A Veitchii are best adapted to cover the walls of a brick or stone house, both having the ability by the peculiar formation of their tendrils to stick to the smoothest surface. A. Veitchii is by far the more graceful but is not considered perfectly hardy whereas A. Englemanii is a native and can always be relied upon so when in doubt plant A. Englemanii.

Of the non-supporting kinds we have a larger variety to select from. Ampelopsis as usual heads the list with its variety. Quinquifolia or five leafed Virginia creeper, also a native and differing from Englemanii only by the formation of its tendrils which twine rather than stick and must have artificial support.

For covering porches, arbors or summer houses we have some very interesting and useful subjects, either in flower, fruit or leaf. Of the blooming kinds clematis paniculata grandiflora, C. Jackmanii and its many types and the trumpet vine (Bignonia Radicans) are the most showy while the bitter-sweet is best for fruit display.

PERENNIALS AND ANNUALS FOR THE FARM HOME.

CHAS. ELLIOTT, Lake Geneva, Wis.

The planting of flowers around the farm home greatly adds to its beauty as we travel along the coutry road we may often pass two neighboring farms that remind one of the backyard illustration entitled "Before and After" shown at the National Flower Show at the Chicago Coliseum.

Many farmhouse yards are adorned with a few scrub trees and bushes, the grass is in an unkempt state. There is of necessity the usual collection of antique farm implements, now out of commission, with the attendant hog and chickens. And there are others. A few well selected trees and shrubs surround a close cropped lawn attended by beautiful flowers. I have in mind such a farmhouse that is tended by two sisters whose brothers follow the vocation of fruit growers. These sisters each spring gather up the leaves that form a natural protection for the plants and at the same time sow the seeds of annuals. Each week they mow the lawn that is surrounded by old fashioned annuals that furnish flowers from frost to frost. There are Peonies and Phlox, Asters and Marigolds, Hollyhocks and Goldenglow, Gladiolus and Tiger lillies and what not. There is a scene like home about this farm home and the income these ladies derive from their poultry is largely supplemented by the sale of boquets to the campers along the shore of our beautiful lake. A fellow delegate advised me to commence my paper with some little love story; here however I fall down and prefer rather to proceed at once to call your attention to the perennial class of plants.

Perennials are plants that live more than two years. Their other name is "legion" for they are many but I will only enumerate those that are popular, perfectly hardy and easy to obtain and I will endeavor to include in my list the ones that will give a succession of flowers the whole season.

The flower we most appreciate is not the last rose of summer but the first flower of spring and I remember how last spring we watched a small round bed from the east window of our cottage. These were hardy primroses edged with Snow on the Mountain (Arabis Alpina) and when those little flowers came how we loved them because there was no others. I want to recommend both these little flowers to you. They bloom in April and May. One of the earliest of perennials that I very much appreciate is the Doronicum often called "Leopards Bane." It is not so well known as it deserves to be. It has large daisy-like flowers of a beautiful yellow shade and appear in company with the better known bleeding heart (Dicentra spectabile). Both these deserve a place in any garden.

I will next call your attention to the Peony which is attaining the popularity it richly deserves. It is so early to flower, so beautiful in blossom and so easily managed that it will well repay the cost incurred in purchasing roots. Here are a half dozen good ones that are sold reasonably. Festiva alba, Festiva maxima, Francois Ortegal, rubra grandiflora, Souv de la Exposition, Golden Harnesh.

The hardy Phlox is indispensable to any garden and is one of the best for the farm. The following are good: La Soliel, Lustre, Ecleareau, Miss Linguard, Diplomat, La Mahdi.

The hardy white daisy known to us as Shasta daisy is one of my favorites but personally not being a Burbankite I prefer to call it as of old Chrysanthemum Maximum.

The old fashion Sweet William makes a nice edging for borders of perennials, blooming in June and July and among others that I would suggest are the columbine, aquilegia known in our section as honey suckle. I like the variety Chinensis best of all the genus.

Hollyhocks we find in any garden and the single sunflower (Helianthus) and the well known Golden Glow should not be omitted.

One of the latest flowers we have in the perennial section is the Anemone Japonica commonly called windflower. It is very free flowering and appears with our first frost in fall.

Before I turn to the annuals I would like to say a word in season for the hardy lilies. They are well worth planting especially lilium Candidum, Elegans, Philadelphicum, Superbum and Tigrinum. Perennials are best planted in late summer, the beds should be spaded two feet deep and liberally enriched with well rotted manure. The plants should be protected in winter with a covering of leaves or litter with a few old branches to keep them where they belong and each spring receive a mulch of good rotten compost.

Annuals are flowers that flower the first year from seed. Their colors are more striking than the Perennials and probably are preferred by the farmhouse gardeners.

The seeds of many annuals may be sown in the open ground in April and May and if carefully transplanted will make a fine show in summer. The following are all good.

Asters, both drawf and branching, phlox Drummondi, stocks, marigold; sweet peas; mignonette; nasturtium; cosmos; early flowering salvia and zinnia. Pansies also come under this heading although they may with a little extra protection be carried over the winter.

In concluding I must mention the dahlia and gladiolus The Dahlia is too well known to need recommendation, but the Gladiolus are not so well known but should be in every garden.

SUMMER MEETING.

The bulbs should be lifted in fall and will keep good in any frost proof cellar.

LIST OF PERENNIALS & ANNUALS SUITABLE FOR THE FARM HOME.

Perennials.

Anemone, Japonica, commonly called "Windflower." Aquilegia, commonly called Columbine. Bocconia Cordata, commonly called Plume Poppy. Chysanthemum Maximum, commonly called Shasta Daisy. Convallaria Majalis, commonly called Lily of the Valley. Delphinums, commonly called Larkspur. Dianthus Barbatus, commonly called Sweet William. Dicentra Spectablie, commonly called Bleeding Heart. Helianthus, commonly called Sun Flower. Iris Germanica, commonly called German Iris (Flag). Lilium Auratum, commonly called Gold Band Japan Lily. Lilium Candidum, commonly called Madonna Lily. Lilium Elegans. Lilium Superbum, commonly called Turks Cap Lily. Lilium Tigrimum, commonly called Tiger Lily. Lythrum Roseum, commonly called Loosestrife. Monarda Didyma, commonly called Bee Balm. Peony. Phlox.

ANNUALS.

Asters

Antirrhinum, commonly called Snap Dragon Cosmos Mignonette Nasturtium Marigold Phlox Drummondi Salpiglossis Stocks Sweet Peas Verbenas

TRANSACTIONS

TO THE

Wisconsin State Horticultural Society

WINTER MEETING.

Annual Convention, Madison, Jan. 18-20, 1910.

TUESDAY AFTERNOON, JANUARY 18.

SMALL FRUIT SESSION.

The meeting was called to order at 2 p.m. Following the invocation by Irving Smith President Toole called on Mr. Richardson for:

REPORT FROM THE SPARTA DISTRICT FOR THE SEA-SON OF 1909.

E. A. RICHARDSON, Mngr., Sparta Fruit Growers Assn.

The season of 1909 had some surprises, also some disappointments for the Small Fruit Growers in the Sparta District. The healthy condition of Strawberry plants when spring opened, and the vigorous growth which they made as the spring advanced, led us to believe that we might expect a fairly good crop. Although the plants were somewhat thin in the row, they were almost entirely free from black root which has been so prevalent for the last few years. As the fruiting season came on we were somewhat disappointed to find that a great number of plants had no fruit stems, and that many put forth only one small stem with but very few berries.

In looking for a cause for these conditions, we came to the conclusion that owing to the late dry season of 1908, the plants did not mature enough to form fruit buds for the crop of 1909, as many of them had but one or two small roots to commence business when spring opened.

Owing to the healthy condition of the plants, our spring setting made a very vigorous growth, and now think that we have the best stand of plants we have had for the past three or four years. All rows in our fruiting beds being full, and as a general thing not too many plants to insure a good quality of fruit and of fair size where the ground is in a good state of fertility.

The Marlboro Red Raspberry, which has been the standby of the Raspberry growers in the past, and which for the last four or five years has been almost a total failure, surprised us very much in the new canes which it put forth, even in the older yards it bids fair to put forth a good crop the coming season. But the attention of the growers have turned to the Cuthbert and early King which of late have made a good growth of cane, and appear to be the money makers, notwithstanding that the Cuthbert comes in so late that we we are not able to get as good an average for the full crop as we did for the earlier varieties.

The Black Raspberry most grown for market at the present time is the Plum Farmer. This is an early berry, about the size of the Gregg but not quit as productive. The fact that it is an early berry, (about 10 days earlier than the Gregg) makes it very popular with our growers, as they have learned that it is the early fruit that brings the best prices.

Of the Blackberry, we have the Ancient Briton, Snyder, and Eldorado, growing in our section; and would say that the Eldorado is now being set to the exclusion of all others. This is an earlier berry than the Ancient Briton, coming on the market about with the Snyder, a much better berry as to flavor and carrying qualities, and more productive than the Snyder, but think that the Ancient Briton will yield more quarts per acre, although the Eldorado, coming as early as it does will give better returns in dollars and cents than either of the other two.

I am unable to give you any information about the Perfection currant as there are but very few currants and Gooseberries grown for market in the Sparta District.

Grapes were a very light crop, none being shipped from our station.

There appears to be a revival in the interest of horticulture, especially in the planting of the apple orchards. And as to the small fruits, we are expecting the largest shipments the coming season that have ever been forwarded from our district. The shipments by the Sparta Fruit Growers Ass'n, for 1909. amounted to about \$60,000 this we expect to nearly double in 1910.

A Member: How about the New Eaton raspberry?

Mr. Richardson: It is not a berry that we care to recommend. Dr. Loope: I would like to ask in regard to your gooseberries, what do they sell at?

Mr. Richardson: I think our gooseberries this year averaged \$1.50 a crate. There is a market for a limited quantity of gooseberries, but a large quantity I do not think would find a ready sale, although I think the use of the gooseberry is growing every year. I would say in regard to the raspberry, around Sparta we are setting out a great many of the King for an early berry; it comes in earlier than the Cuthbert and it seems to be a firm shipper, and I think will be a better market berry for us than the Cuthbert, for the reason that the Cuthbert runs along until we are out of pickers, and it seems to be impossible to get pickers for the Cuthbert.

A Member: Can you tell us anything about the Plum Farmer?

Mr. Richardson: The Plum Farmer is being grown quite extensively with us as a black cap, it is about the size of the Gregg, coming in early, and consequently giving us an early market berry. In connection with this I would say that a good portion of our black raspberries, about sixteen hundred 24-pint cases, were Plum Farmer this year, and those averaged \$2.25 a crate of 24 pints.

A Member: I would like to ask as to the limit of the market for currants?

Mr. Richardson: I think the market is unlimited for any

WINTER MEETING.

article, it depends on the price you want to get out of it. With us, currants this year averaged \$1.37 a crate, but that is more than we can expect to get out of a crop of currants, an extensive crop. I should think one dollar a crate would be a good price.

Mr. Bingham: I would like to ask Mr. Richardson what the strawberries netted the growers this year at Sparta?

Mr. Richardson: We had nearly 30,000 cases for which we paid the growers \$1.21 and a fraction of a cent a case.

Mr. A. J. Smith: I would like to hear a little more about the New Eaton raspberry. I have grown it a couple of years, and this year I had a full crop of it, and I found it the best raspberry I ever saw. It started fruiting earlier and it lasted longer than other kinds, and I did not find, as Mr. Richardson stated, that you could not pull the fruit off the bush easily; I found it just the same as any other variety, and all of my neighbors put the Eaton raspberry down as the best raspberry they ever saw. I exhibited it a good many times.

Mr. Hanchett: The Eaton Raspberry as we have it at Sparta is not a raspberry that we can recommend anybody to plant for the market. We find the Eaton will not pick readily, and this for the market we find an important point.

Mr. Coe: The difference that we find here, I take it, is the difference between a grower for home use and a grower for the market. My friend Smith here can oversee the picking of his raspberries and have them for the table in fine condition, have no trouble in harvesting them, but if you pick them a little bit early, before they are really ripe, I think they are hard to pick.

Mr. Geo. Kellogg: I would like to get a little more information on the Perfection Currant; some of us are interested in this new currant; we would like to know of some one who has grown it in our latitude to say something either for or against it.

Mr. Smith: I have grown it for years; I consider it the best currant that there is on the market. A year ago last summer the leaves dropped from other kinds, while the Perfection currant was as green as grass, bunches of currants almost like small bunches of grapes. I think it is the best currant I ever saw.

REPORT FROM STURGEON BAY DISTRICT.

Mr. D. E. Bingham: I have no report written, so I will give a brief account of the business as it was this last season. A year ago it was rather dry in the fall, and our rows of strawberries were not very thick, consequently we did not have as much of a fruiting growth as we would have had in a more favorable season. At the present time the acreage is perhaps not more than half of what it has been, and last summer we shipped about between 10,000 and '11,000 cases that netted the growers somewhere in the neighborhood of \$1.10 or \$1.11. The raspberry industry has practically been dropped, and we are not growing raspberries for anything more than the local market. Blackberries we are not growing. About a thousand cases of currants were grown and shipped.

REPORT FROM THE WARRENS DISTRICT.

Mr. W. H. Morse: I commence with the strawberry as it is the best berry we have. Our acreage for 1909 was about fifty acres, as near as I can give it, and we have about 100 or 125 acres for next year that are looking fine. The number of cases shipped last year was 5,100, that would only make about 100 cases to the acre, but East Warrens soil is very light and the dry weather cut the crop very short, but at South and West Warrens we have a good clay soil and we have a very good crop averaging from 200 to 250 cases to the acre. As to prices, our berries averaged \$1.10 a case. As to varieties, about nine-tenths of our strawberries are Senator Dunlap, Warfield and Enhance, about two thirds more Dunlap than Enhance, and I will say that our Senator Dunlaps last year gave us more berries than any other variety we had. There are not many raspberries raised around Warrens. The average price this year was \$1.66 and I find that was about what we netted last year and the year before. We generally pick from 150 to 250 cases of raspberries to the acre. Three years ago we picked from one acre and a half, 400 cases. We shipped 2,000 cases of blackberries from Warrens this year and they netted us about \$1.30. We ship by express; most all these berries go to Minneapolis, ex-



Newly erected home of the Sparta Fruit Growers' Association. Cooperation pays.



Home of J. E. Bissel, Madeline Island; Duchess & Wealthy trees in the yard.



WINTER MEETING.

cepting a few on orders. We do not get the big prices that I see they do in Sparta, but we have better shipping facilities; they go by refrigerator cars, and we know what the prices are; we think we have a pretty good commission man at Minneapolis, we could not do better than he can do.

Mr. G. J. Kellogg: What is your best black raspberry?

Mr. Morse: We think the Kansas is about the best. We have the Plum Farmer, that is very good.

Mr. M. S. Kellogg: What varieties of blackberries?

Mr. Morse. Mostly Ancient Briton. They are raising a few Eldorados on account of their earliness, their price is better, they do not last as long as Ancient Briton.

A Member: Is the Eldorado as productive as the Ancient Briton?

Mr. Morse: No sir, they are not, but it is a nice big berry.

BIG BAYFIELD BERRIES.

HARVEY NOURSE, Bayfield, Wis.

The subject assigned to me by your Secretary suggests the style of berries grown at Bayfield, but if size of berry were all, this in itself would not make berry growing a success, however, we have the quality and the yield as well.

First, as to big berries, I have seen berries picked from my strawberry fields measure seven inches in circumference. One of our growers declares he filled a quart box with eight berries and quite a number of boxes each with sixteen and twenty berries. I have known a day's picking of the Senator Dunlap variety to count about 26 berries to the quart and there are other varieties much larger than the Senator Dunlap but we have yet to find in our section a better variety. F. V. Holston of our city, one of the first men to engage in strawberry growing, a number of years ago sold to the Stone-Ordean Company in Duluth two twenty-four quart crates of strawberries at \$5.00 per crate under a guarantee that not a berry in the crate should measure less than five inches in circumference. They wrote Mr. Holston afterwards that they were very much pleased and the

berries were satisfactory in every way. From a two and onefourth acre field of Dunlaps a year ago we picked 860 crates which sold for \$1,272.68, which, after deducting cost of crates and picking, left a balance of \$922.54 or about \$400.00 per acre. Our field last season containing about three and a half acres yielded 1,250 crates that sold for \$1,989.98, which after deducting cost of crates and picking, left a balance of nearly \$1,500.00. Our crop last season was cut down by an exceedingly heavy rain storm which prevented our shipping any berries for nearly a week. Some idea of what we might have done may be had from the fact that from two day's picking of this field, after deducting commission and freight, we received \$1,019.00 for the berries. Most of these berries were also of the Dunlap variety. A neighbor of mine from less than one-sixth of an acre sold \$206.00 worth of berries. No spraying was done on any of the fields mentioned and very little fertilizer was used but they were thoroughly cultivated and a dust mulch maintained on the new fields during hot and dry weather and on old fields after fruiting.

Bayfield strawberries are extensively known to excel in quality, extra size and appearence. I have a letter in my office from the largest commission house in Duluth written me after the close of the berry season stating that our berries were the finest shipped to that market. The berries were shipped in refrigerator cars and sold for about \$2.00 per sixteen quart crate, less commission and freight. We shipped one car to Minneapolis that sold for \$2.25 per crate. Nearly 100 acres have been planted to strawberries the past season and as an evidence of the development of the Peninsula as a small fruit section allow me to quote from a letter received by one of our townsmen, from W. H. Hanchett of Sparta, Wisconsin. Mr. Hanchett says; "this order for berry crates makes a total of over 23,000 crates for Bayfield for the coming season and places this point second in importance in the State with Sparta first and Eau Claire a close third. If you double again next year, Sparta will have to look to her laurels as the chief place." The indications are that we will double and Sparta will have to give way to the Bayfield Peninsula.

The raspberry has not been planted extensively, however several acres were set last year and I understand quite a numben of acres will be set this coming spring. One grower alone

WINTER MEETING.

will set five acres. Those that have been grown in a small way prove to us what can be done. I don't think anyone could possibly grow larger Cuthberts than were picked from my small plantation last season, and the Plum Farmer Black Raspberry yielded at the rate of 7,000 quarts per acre. I shall plant quite largely to this variety next season.

As to the Blackberry, the Ancient Briton, is the variety generally grown. It grows to an enormous size and bears abundantly. We have one field in our town containing onethird of an acre that was planted eighteen years ago and has borne a good crop of berries each year since, however new fields will be set largely to the Eldorado. This variety follows the raspberry more closely and makes it a more satisfactory berry in several ways. Will also say that a great many acres will be planted to the currant which fruit also reaches perfection in our climate.

With this much for our small fruits I would like to say just a word concerning what we are doing with larger fruits. One hundred and twenty-five acres will have been set to cherries by next spring. This fruit excels in the Bayfield Peninsula; the trees load up with fruit each year. There is no doubt but what the Peninsula is destined to become one of the greatest cherry growing districts in the country. The largest apple orchard in the State is now located at Bavfield. This orchard comprises sixty acres and will have twenty acres more added to it next spring. This orchard is owned by Mr. William Knight, our delegate to the Convention. A great numbebr of other orchards of from two to ten acres have been planted and the trees generally are doing fine. There is something about the soil and climatic conditions of the Peninsula and Apostle Islands that make this section peculiarly adapted to fruit growing. This is very evident from the way trees load up with fruit and in this regard I should like to repeat what I stated in my paper read before the Minnesota Society, "Think of a one year English Morello cherry tree, thirteen months from planting, vielding seventy-six cherries and a Patten Greening apple tree planted the spring of 1906, yielding this season one hundred and six apples that averaged half a pound each." Two small Wealthy apple trees in my garden gave me four barrels of beautiful apples with not a wormy apple or one affected with scab to be found in the lot and so I might mention many instances of

remarkable yield but time will not permit. Should like to call attention, however, to the Duchess apple as grown with us. Think of having Duchess apples the middle of January that are firm and solid, kept on a shelf in an ordinary cellar! We have just such Duchess grown at Bayfield. I heard one genttleman at the Minnesota meeting make complaint because their town had no suitable express rate on apples and for this reason he could not ship the Duchess as it would be twenty-four hours in transit by freight. Our Duchess would ship to California and then back to New York, if necessary, and the planting of this variety in our section is going to make the growers lots of money, and so I might mention the Wealthy, Patten Greening and other varieties but this is out of line with my subject.

A few more words concerning another peculiarity that we cannot account for and that is this; the thimble berry, sometimes found in New York State and parts of New England and Washington grows wild throughout the Peninsula and Islands but is confined entirely to this section and what is known as the Washington Hazelnut, a very large species, is produced in the same way indicating that there is something peculiarly beneficial in our soil and lake climate for producing all kinds of fruit and particularly Bayfield Big Berries.

The President: I am sure if the Horticultural Societies of our state will speak the plain unvarnished truth about the resources of the state of Wisconsin and let the people know the facts, we will save a great deal of money to the state and save a great deal of disappointment to many people who are sending money out of the state.

Mr. Hanchett: Our president has told us that he hopes that the members of this society will take opportunity to get up and speak the plain, unvarnished truth about the horticulural resources of this state. Now, I would like the opportunity to ask Mr. Nourse why he did not speak the plain, unvarnished truth about the Plum Farmer raspberry crop. I had a little talk with him, he spent Sunday with me, and he gave me the real facts in regard to the Plum Farmer raspberry crop, which he did not give here, he told me the real yield was 12,000 quarts per acre, instead of 7,000.

Mr. Nourse: Well, that is the fact, it yielded that in my

WINTER MEETING.

garden, but I do not want to go on record as saying that we could grow Plum Farmer raspberries at the rate of 12,000 quarts, which figured up about \$2,400 to the acre the way the Sparta people sell their berries, but I first got it down to 8,000, then down to 7,000, and then went on record at the rate of 7,000.

Mr. Philips: Mr. Nourse was like the Quaker advising his boy; he said it was a great deal better to tell a probable lie than an improbable truth.

STRAWBERRIES NEW AND OLD.

GEO. J. KELLOGG, Lake Mills, Wis.

New:

1st Norwood after 2 years' trial I place at the head of the list for every good point as a promising new variety.

Heritage, every way worthy—very early and holds very late, wonderfully productive and fine quality.

Ozark, best large early that will be satisfactorily productive. Highland, early, productive, ripens its crop at about 3 pickings.

Corsican, of the Jessie type and superior to that variety in many ways.

Buster, for large size and productive.

Everbearing Kinds:

Pan American (H) poor plant maker but bears enormously till snow flies.

Autumn (P) wonderfully productive and bears till it freezes up. Repeater, worthy of trial.

Strawberries Old:

Dunlap and Warfield as best pair.

Haverland and Splendid for 2nd best pair.

Bubach and Klondike for best big berries.

Glen Mary and Wm. Belt for largest big berries for fancy market.

Parsons Beauty and Sample bring top prices.

Brandywine, Gandy and Stevens late.

Champion for best late, large and good shippers.

Best 3 for all purposes, Dunlap, Warfield and Brandywine.

Currants:

Best new, Wilder, Perfection, London Market and Pomona.

Best late, Victoria, Prince Albert, Long Bunch Holland, La Vesailise, White Grape, North Star and Red and White Dutch.

Gooseberries:

Best new, Pearl and Ozanne.

Best old, Downing, Red Jacket and for canning, Houghton.

Blackberries:

New, Eldorado, Mersereau and Early King.

Old and reliable, Snyder, Ancient Briton, Badger, Kittatinny, Stones Hardy and Erie.

Black Raspberries:

New, Plum Farmer, Black Diamond and Cumberland. Old, Black, Gregg, Kansas, Palmer and Ohio.

Red Raspberries:

New, King Brilliant, Cardinal and Ruby.

Old Red, Loudon, Cuthbert, Brandywine, Marlborough and Miller.

Best purple tip raspberry. Columbian.

Best yellow, Golden Queen.

Grapes:

Best early, Moore's, Campbell's Green Mountain and Worden.

Best white, Lady, Diamond and Niagara, Concord where you can grow Dent Corn, Brighton, Agawam, Wilder and Merrimac.

Dr. Loope: I would like to know about the Glen Mary and what the success has been in different parts of the state with that.

Mr. Coe: The Glen Mary does very well with us, good grower, good berry.

A Member: I would like to ask this gentleman if he considered the Pan American worth raising for a fall crop?

Mr. Kellogg: I would not dabble with it, except for private use, for a private family, or for an amateur it is worth while to try it.

A Member: On our ground a year ago last summer we

WINTER MEETING.

raised 100 plants from five. We got seven plants and two of those died and from the five we raised 100 plants of Pan American, very rich soil, and we gave them good cultivation.

Mr. Moyle: Mr. Crawford of Ohio writes me that he has this season propagated several new varieties of fall-bearing strawberries and all are good. These were distributed in trial lots to nurserymen this year. In my opinion these fall-bearing kinds are valuable mainly in the home garden.

Mr. Kellogg: I want to say one more word in regard to the Autumn. After planting the original plantation, they bore so that I had one plant that had 118 berries, blossoms, and buds on it, that I took up and carried to the Jefferson county Fair. Another I carried to Beaver Dam that had fifty-three berries at once, and of course a plant that yields so much, they cannot be large, unless it is up at Bayfield. It might be there.

Mr. Richardson: I would like to say a word in favor of the Red Bird strawberry. We have only tried it in a small way the last two or three years, we find the color is good, it is of the Dunlap and Warfield type, good color, red berry and very productive. It is too early yet to say if it is going to stand up with the older ones, but the indications are that it will.

A Member: I would like to ask Mr. Kellogg about the Norwood.

Mr. Kellogg: I am very favorably impressed with the form, size, quality and productiveness.

A Member: I want to know what type it is.

Mr. Kellogg: It is of the type of the Jessie family.

REPORT ON STRAWBERRIES.

HENRY B. BLACKBURN, Richland Center, Wis.

Strawberries here this season a bumper crop; in my ten years experience this was an ideal year. Among the varieties that did extra well were Glen Mary, Senator Dunlap, Burbank, Wonder and Cardinal. Red Bird outyielded any on the list but the berries run too small and they are not the best flavor and are not any earlier than Senator Dunlap. It is a fine colored berry and even more hardy than Senator Dunlap. Stephen's Late

65

5-H. S.

Champion, the great brag berry, is a great grower but when it comes to fruit it is disappointing in yield, flavor, size, etc., so many imperfect berries while Fremont Williams by its side is even later and twice as productive. It is just as vigorous a grower and all the berries average large, firm and smooth. With me it is the most productive late variety I have tried except it might be July. I have not tested it enough yet to know but I think it will even surpass Fremont Williams.

Virginia sold or introduced for extra early was disappointing in every respect.

Chespeake Late was a complete failure. Highland will be a wonder if it does as well another year as this year as it more than bears out the introducer's claim.

DOES INSPECTION OF SMALL FRUIT PAY THE GROWER.

By E. F. BABCOCK, Sparta.

The title of this paper "Does inspection of small fruit pay the grower" naturally suggests another and a greater question, "Does an association of growers and shippers benefit the grower" for as a matter of fact inspection and grading are simply necessary adjuncts to the machinery of a successful association.

The Inspector acts as an equalizer in fixing the grade and comparative value of the product of the grower and making it possible to bring the entire crop of any particular section under one management and thus relieve the grower of the labor and responsibility of marketing his product at a time when he is much needed at home.

It must always be kept in mind that small fruit is highly perishable and on its maturity must be moved with rapidity and despatch. Inspection makes it possible for the manager of an association to distribute his product to much better advantage than would be possible had it not been examined and its grade and shipping qualities determined, as some of it may be more firm and can be shipped a long distance with safety while the balance can be distributed to points nearer home to good advantage, even when all are of the same grade. This
system of intelligent distribution is one of the secrets of the great success of the Sparta Fruit Growers' Ass'n.

The buyer is also benefited by inspection, for under this system he is assured that stock will be selected each day that is best adapted to his use; if he be located a long distance from the point of shipment he knows that only the firmest stock will be consigned to him or if he be located near by he knows that he will get just what he desires, stock ready for home consumption.

Another benefit to the grower is the record of the Inspector of the quality of his product which may be very valuable in the pressing of damage claims, as his stock has been examined and its grade and shipping quality determined by a disinterested expert at the primary shipping point and the grower therefor is not handicapped by the fact that he only knew the condition of the stock when it was delivered to the carrying company.

The Inspector also acts as an instructor to the grower, and this has probably been the greatest benefit of all to the growers at Sparta, for as they deliver their product each day at the grading platform the Inspector is constantly looking for and pointing out defects in picking, packing or delivering and illustrating by comparison where they have failed and if possible suggesting a remedy. I have noticed that more than one-half of the low-grade stock was due either to the carelessness or the ignorance of the grower. These lessons have had their effect and today the general appearance of the stock brought to the Association has improved 100% and slack filled boxes, over-ripe fruit, or stock delivered in a mussy condition from rough handling is a rare exception.

That the retailer appreciates the advantages I have set before you is demonstrated by the fact that in the past four years the order business of our Association has increased by leaps and bounds and the past season it taxed its officers to the utmost to care for it. The reason is very plain, the buyer, whether he be a retailer or a car-lot distributor, is no longer forced to trust to the judgment of the gower, who for all he knows may be inexperienced in shipping or whose ideas of what constitutes good shipping stock may be entirely at variance with his. As it is, the buyer trusts the inspector who acts as a third party and whose duty it is to keep his grades up to a standard that will command the confidence of the trade.

In this way the buyer's risk has been reduced to a minimum

and he is willing to pay more for inspected stock than he would pay on the street direct to the grower. These are some of the advantages the grower receives by the system of inspection which has been a great benefit to the growers of Sparta, for under it the association has not only been able to obtain for them a greater net profit than ever before but has taken from them a great part of the labor and worry in the marketing of their produce. At the same time the association has constructed and now occupies a new \$10,000 building thoroughly equipped for its needs and not only have the officers the fullest confidence*of the members but of the trade wherever its product is offered for sale. Successful as inspection at Sparta has proven itself to be, the officers of the association do not feel that they have vet done all possible but are seriously considering the wisdom of instituting what is known as field inspection which will give the Inspector a greater opportunity to examine the stock and instruct the growers in the picking and packing of his product.

Mr. C. L. Richardson: Will Mr. Babcock tell us of what this inspection consists?

Mr. Babcock: It consists of examining stock as it is delivered, and grading it, separating it. We make at Sparta four distinct grades.

Mr. Daub: Have you ever tried field inspection ?

Mr. Babcock: Of course inspection as we have practiced it at Sparta has been practiced entirely on the grading plan, but field inspection is an undeveloped quantity as yet. People think it is a good thing and I think that it is coming if not this season, it is sure to come sooner or later.

Mr. Richardson: If a fruit grower comes in with a load of berries, what do you do, do you rip off the covers to inspect the fruit, or what do you do, exactly?

Mr. Babcock: Not without I suspect something. When a grower delivers a load of berries at the platform, I make it a point to take out perhaps the second crate, then perhaps I will let three or four go on, pass them by, then take another crate out, split the cover, examine it, perhaps raise the top of the box and look in, and if I suspect anything, even go so far as to dump the box of berries. Of course my experience in inspect-

ing small fruits has been confined entirely to Sparta, that being the place where I was born and brought up; I know my men.

Mr. Hanchett: The field inspection would be largely for the purpose of instructing growers, helping them in grading, and also in detecting those who are not packing in the right way.

Mr. Babcock: Yes, and it gives the inspector an idea of what that man has, he can see it on the vines and if he knows his business he can tell how that stock will look in the crate before he commences to pick.

Mr. Hanchett: While you are on this subject of inspection, it might be of interest to the strawberry growers here to know what inspection means in the Hood River district. I had the privilege of interviewing some officers of the Hood River Strawberry Growers' Association this fall and I found there the berries were all repacked when they were brought in from the field ; they had a force of packers who repacked each box. The berries were emptied out, any overripe berries were thrown out and the fruit repacked in the boxes. It is highly important that no overripe stock goes in, where they travel so far to the market, and of course the freight charges are so high that it does not pay to put any inferior stock on the market, and their inspector holds every box of berries and sees that they are repacked. Whether or not we shall ever get to that here in Wisconsin is a question. If we ever have to reach out to markets as distant at the Hood River growers do, we certainly would be compelled to resort to that kind of inspection. I have no doubt they will be doing that at Bayfield before long.

SMALL FRUITS-PRINCIPLES OF MANAGEMENT.

O. M. TAYLOR, Geneva, N. Y.

A discussion of Small Fruits will not be complete if centered about lists of varieties, distance of planting, cultural treatment, or enemies to be held in check. These subjects are important and some knowledge in regard to them is essential. Yet this information should be combined with a broader knowledge which takes in principles relating to soils and to plants. Back of all this is the human equation—the man—who more than anything else is the controlling factor.

The Small Fruit business is not a small business—it is intensive farming, with methods more exacting than in general agriculture. The greatest results are never secured by half-way measures. Suitable climate, soil, culture, markets are not sufficient. The personality of the man puts its stamp upon the business—it is the mind—directing the operations of fruit growing that effects final results.

Occasional failures or partial losses always occur; yet it is seldom that all the Small Fruits fail in any one season, and for this reason some find a decided advantage in a variety of the fruits that may be grown, such as strawberries, red and black raspberries, blackberries, currants and gooseberries.

Location. Some attention must be paid to the location. Occasionally it is impossible on account of uniformity in type of soil or of slope, to make much selection. It is usually the case, however, that some parts of the farm are better adapted to one fruit than to another. The most suitable location, as a rule, is one sufficiently elevated above adjoining lands as to be free from danger of serious late Spring or early Fall frosts caused by the tendency of cold air to settle in the lowest areas. A slight slope also simplifies questions of drainage, and in addition, permits the planting of varieties most likely to be injured by frost on the higher elevation. The habit of growth of the plant, character of the fruit, distance to which the roots travel, and susceptibility to injury by lack of sufficient moisture should be considered in the selection of the site.

Exposure, or Direction of Slope. The direction of slope influences the temperature of the soil and often has a marked effect on the time of ripening of the fruit—a southerly slope and a light sandy soil tending to hasten maturity, while a northerly slope or a heavier soil tends to retard maturity. This has a bearing upon the market to be supplied—whether early or late.

Preparation of Land—Tillage. Until we understand the importance of tillage this part of the work will too frequently be neglected. Many growers are guided in the number of cultivations by the unsightly appearance of weeds, and in a dry season—which is unfavorable for their growth—cultivation frequently ceases in part or altogether; whereas such a time is the one season of the year during which the greatest good may be secured by frequent cultivations—mostly shallow with Small Fruits, but sufficiently deep to ensure an efficient dust mulch.

It is unnecessary at this time to set forth in full the advantages of tillage. Among the many benefits derived, its relation to the food supply and to the water supply are of most importance. Tillage is one of the cheapest and most efficient agents in setting free unavailable plant food, and in hastening decomposition of organic matter. But of greater importance than this is the relation of tillage to the water supply. An abundance of food without moisture to carry it into solution is of no use to the berry plant; by an inexpensive operation of tillage—not only is the water-holding capacity of the soil increased but evaporation from the surface is checked and the moisture becomes of use to the plant.

The roots of berry plants do not extend far as compared with those of tree fruits and this fact increases the importance of this phase of the subject. The surface soil quickly loses moisture and the shallow root system of the strawberry, the currant and the gooseberry is injured in droughts which have no effect upon the apple or the pear. This question of moisture is always a serious one to the Small Fruit grower. The crop may be carefully nursed for weeks up to the season of maturity of the fruit, and a week of dry weather may reduce the yield from one-quarter to one-half. The crop harvested is largely composed of water. Analyses indicate that the following amounts of water are present in every 100 lbs. of ripe fruit: Strawberries, 90.8 lbs.; raspberries, 81.8 lbs.; blackberries, 88.9 lbs.; currants, 86 lbs.

Of all these fruits the strawberry is most quickly injured by drought—nearly all the roots are within the upper 15 inches of soil—a limited space—and are quickly effected during the fruiting season by a few days of dry weather. The average rainfall is not sufficient to mature the crops without some effort to conserve moisture by cultivation or by mulching. Scarcely a season passes—and 1909 was not an exception—but that one or more of the Small Fruits is reduced in yield from 25 to 75 percent because of lack of moisture. At the Geneva Station the total rainfall during the months of June, July, August and September in 1909, was but 8.64 inches, much too small an amount for normal yields.

Fertilizers. There is no one brand of fertilizer best suited for strawberries, another for raspberries, or for blackberries, or for the other Small Fruits—under all conditions and for all soils. The kind and amount to use depend largely upon the

kind and amount already in the soil. The Geneva Experiment Station is frequently requested to make analysis of a soil and to forward a formula, based on the analysis, most suitable for any one of the Small Fruits. It is possible for the chemist to tell what is in the soil and how much, but he cannot determine how much of this is available to the plant or how rapidly the plant may use such food. Some soils may lack nitrogen-others potash, or phosphoric acid, and many are deficient in humus, or lack of fertility may be due to unfavorable soil texture or to bad drainage, under which condition fertilizers will be of but little use until a more favorable environment has been secured. One method of determining the kind and amount to use is by trial, leaving check rows for comparison. If the soil responds to phosphoric acid, applications of fertilizers rich in this form of plant food should be made, and so with potash or nitrogen. Possibly a combination of two foods may meet the needs of the soil or perhaps a complete fertilizer may be found most suitable. These fertilizing materials should be applied in such a way as to make comparisons with each other and with checks, to which nothing has been applied. It is more difficult to use cover crops among small fruits than with tree fruits, yet they may at times be used to advantage, and when combined with the use of stable manure may do much to keep up the supply of humus.

Distance of Planting. In general the plants should not be crowded. There should be ample room for each plant to secure its share of food and moisture from the soil, and air and sunlight should not be shut out from the growth above ground. The distance apart of rows and of plants depends on the system of cultivation, character of growth and richness of the soil. Red raspberries may be set closer than black raspberries, six or seven feet by two feet, and blackberries still further apart. Currants and gooseberries $4\frac{1}{2}$ to 6 feet apart, and strawberries the closest of any of the small fruits.

Pruning. The operations of pruning are not so difficult as with tree fruits—yet some attention must be given to this subject. The old canes of raspberries and blackberries are of no further use after the fruit has been harvested. They frequently harbor insects and diseases as well as crowding and shading the new growth. For these reasons the practice is followed among many growers of cutting out and burning the old wood as soon as the fruit has been harvested. The pruning of currants and

gooseberries consists in keeping the head sufficiently open and in removing some of the oldest wood each year after the bushes reach maturity, as the best fruit is secured from the younger wood.

Protection of Plants. The development of the fruit bears a close relationship to the health of the plant. Insects and fungus troubles weaken the plants, and spraying is essential in keeping down currant worms, and in holding the foliage of currants and gooseberries in late Fall. Unfortunately no satisfactory remedies have as yet been found for certain diseases such as orange rust of blackberries or anthracnose of black raspberries, and in such cases prompt measures should be taken to dig and burn infested plants, or to practice a system of frequent plantings of healthy stock, giving the best of care to secure a vigorous and well developed growth.

Winter protection is desirable and even essential with some of the Small Fruits. Strawberries should be covered with some material that will give protection against freezing and thawing, and at the same time not smother the plants. A few tender varieties of raspberries and blackberries must be laid down and be protected with old mulching and soil to avoid serious killing back of the canes.

Selection of Varieties. Environment exerts a strong influence upon both plant and fruit. By environment is meant any or all of the surrounding influences of air or soil that in any way effect the development of the plant. Above all things the plant must be comfortable to do its best, and when for some reason the surroundings are not congenial it will not do so well as in some other locality which has more suitable conditions. Varieties best adapted to one set of conditions may be failures elsewhere. Lists of varieties are almost always unsatisfactory. Only those varieties should be extensively planted that have by actual trial shown their fitness for the location. One of the most valuable places on any small fruit farm is its test plat in which is being grown on a small scale the newer and apparently more promising varieties that have not as yet shown their value. In the selection of varieties some attention must also be given to the market supplied. Varieties suited for one purpose may be useless for something else, and the object in growing must be kept in mind, whether for dessert, canning, local or distant markets or for evaporating. The variety selected should have

those qualities which recommend it most strongly for the special purpose in view. Many of the kinds grown 25 years ago have been discarded and it is to be expected that many of the kinds grown at the present time will be on the retired list in the next quarter century. New varieties are receiving recognition each year. The progressive grower should not hasten to discard his standard varieties for something new and untried, but should be ready to introduce into his test plat those that appear to possess superior merit.

In conclusion it may be somewhat of a disappointment to some persons not to find detailed instructions in regard to the various operations connected with small fruit growing. It must be kept in mind, however, that the details on one farm may be quite different and illy adapted to some other place, yet the suggestions presented at this time apply in all places and under all conditions.

(See discussion, page 122.)

WEDNESDAY MORNING SESSION.

PRESIDENT TOOLE'S ADDRESS.

OUR AIMS AND INFLUENCE

Having occasion to look for horticultural information in some of the early annual reports of our state horticultural society, I was much interested in noting the trend of thought in the state more than thirty years ago.

Then as now our people gave thought to the beautiful in horticultural art, and then more than now the ladies of our society helped to encourage and instruct in the principles of home adornment. All of the various classes of fruit which might be expected to thrive in Wisconsin were being tested, and then as in these days the apple furnished the leading subjects for discussion. At one meeting the late J. C. Plumb stated that during the fifteen years previous to 1855 all of the leading varieties of fruit common to the eastern states flourished here in Wisconsin. Then followed disaster and a close revision of the recommended lists of varieties.

Dr. Hobbins, president of the society in 1870, in his annual

address, advised general planting of hybrid Siberians for home use while varieties of apples were being given a trial.

The society's recommended list of hardy varieties was as follows: Fameuse, Talman Sweet, Golden Russett, Duchess, Red Astrachan. For further trial the following list was given: Sops of Wine, Fall Stripe, St. Lawrence, Fall Orange, Plumb Cider, Perry Russett, Willow Twig, Red Romanite, Blue Pearmain, Seek-no-Further and still others for more extended trial.

Afterwards were the Russian varieties and numerous seedlings for which great hopes have been entertained.

In that early day there was a desire for extensive experimental grounds to be cared for under the direction of the State Horticultural Society. In Secretary Wiley's report for that year, he writes in regard to the proposed, "Horticultural Gardens of the Society." Imagine for a moment a thousand varieties of apples growing there, five hundred of pears, one hundred or more of plums, and as many grapes and strawberries." Since that time, experimental gardens and stations have been established in various states, but I have not learned that anything of the kind has yielded such practical results as our Wisconsin trial orchards are doing.

Courage, industry and perseverance have been characteristic of the men who have labored continuously to establish successful fruit growing in Wisconsin. We are reaping the reward of their efforts.

In those days the fruitmen were asking for a state entomologist. He has been a long time coming and still we need him. They had not then the advantage of spraying which we have. Neither were they so rich in varieties adapted to the needs of our state. The experiences of the past few years indicate that we can grow better fruit and at less cost than that which we have heretofore placed on the market. With the reduced cost and improved quality we are certain of a greatly increased houce consumption of apples. Even at the present high prices local demand for home grown apples has been very large.. Since commencing to write this paper I have learned from one neighbor that he has sold in the city of Baraboo and vicinity 300 bushels of apples and still has about 100 bushels to sell. Another has sold in the city and vicinity 480 bushels and a considerable quantity in Prairie du Sac. These quantities must be only a small part of the home grown apples consumed in and near Baraboo, in addition to what has been shipped in by the merchants from the East.

The program which has been prepared by the secretary indicates that we will learn much of how widely throughout the state successful orchards have been established and that apple growing in the state of Wisconsin is now a profitable industry.

A condensed history of fruit growing in Wisconsin such as might be compiled from the annual reports of our society would be very interesting reading. Such a history would convincingly show how much has been done for Wisconsin horticulture by the society. When the new card index of our annual reports become available, we will realize that a set of these volumes will be a valuable encyclopedia of horticultural information.

In looking over the lists of members, we note how few there are now actively engaged in the work of the society who were members twenty-five years ago. Many are gone, but their work still endures, and the influence of the society yearly increases in value. The influence of the society is as broad and far reaching, as is the meaning of the word Horticulture in its broadest accepted sense. Decoration of home and school grounds, yards and drives, with lawns, trees, shrubs and flowers have all been considered. The most profitable methods of producing the various fruits adapted to our climate have been shown. We have maintained high ideals and thereby broadened and strengthened our influence.

The horticultural interests of the state are now so varied that we need to make our minds familiar with them to the end that a just balance is maintained. An intelligent knowledge by the members of the scope of our society's work, will greatly increase its strength and value. Each member of the society should keep in touch with the executive member of his district, and offer such suggestions as may seem helpful to the society whenever they occur to him. It seems to me that a condensed review of the executive committee's proceedings during the year should be read before the society at each annual meeting, that our members shall have a full knowledge of the working plans of the society.

Our state legislature has generously sustained with liberal appropriations our efforts to promote the horticultural interests of the state. This support has made it possible for our society

to establish horticultural work which will be of inestimable value to the state..

A decided interruption or abandonment of this work would be a great loss to the state, particularly to the development of some of the more recently settled portions of the state. Our state legislature last winter very commendably studied how best to economize in appropriations, when it seemed necessary to them. There were some members of the legislature who did not understand the value of what we are doing and there are many persons throughout the state who are surprised when they learn of the extent and value of the work of our society. Let us make ourselves fully conversant with the scope of our work and make known to the people of the state the good which is being done by the Wisconsin State Horticultural Society.

Mr. G. J. Kellogg. Speaking of old time varieties way back in Dr. Hobbin's time, I recollect that we passed this resolution in regard to varieties. "We recommended five varieties to which there would be no objection, Red Astrachan, Duchess of Oldenberg, Fameuse, Tolman's Sweet and Golden Russet," and those five varieties stand by us today.

REPORT OF SECRETARY,

F. CRANEFIELD.

The year 1910 opens with fairer prospects for the State Horticultural Society and for Wisconsin horticulturalists than has any previous year in our history.

Trial and tribulation marked the early days, failure was the rule, success the exception. Varieties planted with great hopes succumbed to summer heat or winter frosts but with patience and perseverance the pioneers cleared the way for us and brought from Wisconsin soils fruits adapted to Wisconsin conditions.

All of this was done for us by the pioneers in Wisconsin horticulture, who marked clearly and distinctly with danger signs the pitfalls of varieties, winter care and soil needs. Our friends the scientists of the experiment stations have armed us against our enemies of bugdom and disease, the free institutions of America, the limitless opportunities of this most wonderful land on the face of the earth, has brought forth a population of 90,000,000 people, scon to be 200,000,000 to consume our apples, our cherries, strawberries and all else we grow.

We stand then at the beginning of this year of our Lord 1910 with boundless opportunities before us. It behooves us to take stock of our blessings, to take a cheerful and optimistic view of life.

We can raise as good apples as any state either East or West, we have the best of markets for all we raise, we can produce berries of all kinds including the toothsome cranberry, rains fall alike on the just and the unjust with no necessity for million dollar irrigation canals and spring and autumn frosts touch us but lightly if at all so that the orchard heater is unknown; for all of this and much more than twice all this let us rejoice.

So far as crops for 1909 are concerned the different papers and reports to be presented during this convention will give a better idea than can be given in a report of this kind. In general it may be said that the apple crop was light—probably 50% of a full crop while cherries and plums averaged much higher.

The Orange Judd Farmer estimated the yield of apples in Wisconsin for 1909 at 250,000 bbls. or 750,000 bus. This seemed too high and a little investigation was started from the office of the Secretary. Blanks were sent to all counties where apples are grown and from 59 reports received I am ready to concede that the newspaper estimate was conservative.

Many surprising features developed from these reports and not the least surprising the fact that a very large percentage of our apples is consumed at home. A number of districts, each reporting a production of 3,000 to 5000 bushels, reported none barreled and shipped but all sold on local markets for home consumption. This is probably the most encouraging fact brought out, that we are as yet producing but few more apples than we need at home, the reports showing but 50,700 barrels packed and shipped.

Another interesting fact is shown in the lists of varieties reported; Duchess, Wealthy, Famuese, McMahan and Northwestern appearing in all lists and nearly always in the order given. This would seem to show that the tendency is in the direction of fall varieties. I am well convinced that the future for apple raising in Wisconsin lies in this direction and "Early Apples" should be always our motto.

I have discussed this subject of early varieties so many times in my reports that I hesitate to enlarge on it here except to say that there is little doubt that of the 50,000 barrels of Wisconsin apples marketed last fall every barrel was sold, shipped and 95 per cent consumed by Dec. 1st and most of them before Nov. 1st. If perchance there should be anyone here today who looks with longing eyes toward the irrigated West as the paradise of fruit growers let him ponder on this fact and ask what it means.

If there are yet members who still harbor the delusion that the choicer varieties of winter apples may be grown in this state and point to occasional old trees which still survive as examples I would refer them to the reports of this Society beginning with 1869 and especially the recommended lists of those days; then follow carefully down the years to the present. When this has been done consider very carefully the story as there written; and lest we set too high value on our own knowledge let us not forget that, "there were giants in those days" as well as now.

Men like Plumb, Peffer, Stickney, Tuttle, Hoxie and a host of others were men of sound-judgment, courageous and persistent. They finally abandoned the fight for Baldwin, King, Rhode Island Greening and all the others of that class and brought us to the safer and more substantial basis of Wealthy, Duchess and McMahan.

Let us profit by that fifty years of experiment.

Proceeding now from flights of fancy to routine matters it may be said that as members of the Wisconsin State Horticultural Society we also have cause for congratulation.

The Society is today in every way stronger and better than ever before.

MEMBERSHIP.

Our records show a membership of 1,072 of which 140 are life members and 932 annual. This does not include honorary members, the exchange list nor these who are in arrears. The following record is of interest as showing the increased interest in our Society and confidence in our work.

Membership.	Life.	Annual.	Total.
n 1900 1901 1902 1903 1904 1905 1906 1906 1907 1908 1908 1909	25 25 31 36 43 63 86 101 121 140	116 114 128 111 236 305 342 551 698 932	141 139 159 147 279 368 428 652 819 1072

Now that we have safely passed the thousand mark our next standard should be the two thousand mark and that might easily be reached if each member should secure one new member during the year. Your secretary can conceive of no plan more simple nor effective.

Since Nov. 1st, 1909, and to date the following members have secured new members.

Benj. F. Faast, 3 members; Mrs. A. J. Schloerb, 1; Conrad Hoffman, 4; H. J. Bennett, 1; Rev. Hengell, 3; Mr. West, 1; J. N. McLeod, 1; Jos. T. Evenson, 1; Geo. B. Smith, 1; Danford Larkin, 4; J. J. Miles, 4; Dr. Chas. L. Babcock, 1; Geo. Trim, 1; F. W. Harland, 2, (life); Thos. Tollefson, 1; Dan Fisher, 2; Edward Zade, 3; E. W. Sullivan, 3; J. B. Loverin, 2; A. K. Bassett, 1; Andrew Kull, 2; John Spencer, 1; B. S. Wright, 2; J. C. Proctor, 1; G. M. Breakey, 10; Walter A. Conant, 1; O. Knutson, 1.

FINANCES.

The Treasurer's report in addition to showing in detail how the money was expended will also show that we lacked \$35.00 on July 1st, 1909, to meet our obligations. Neither the Board of Managers nor the Executive Committee however has seen in this any cause for alarm nor grounds for criticism but feel rather that everyone concerned in the expenditure of our appropriation is to be congratulated on *spending* this money.

The people of this state through the legislature entrusted this fund to us to be spent in the development of horticulture in the state and not start a savings bank. That it should be wisely, carefully and economically expended should be the concern of every member of this society.

LOCAL SOCIETIES.

A resolution passed by the Executive Committee last winter requires every local Society to enroll its entire membership in order to be entitled to a delegate. The following societies have complied with this rule: Barron, Bayfield, Gays Mills, Lake Geneva, Madison, Manitowoc, Oshkkosh, Poysippi, Algoma.

A few of the locals are active and worthy of the name of auxiliary societies, the others are merely social organizations or else meet but once a year in order to maintain their name.

Of the first class the Lake Geneva Society is an example. This society holds regular monthly meetings which are well attended, and an annual exhibition. In point of interest and amount of work done the Lake Geneva Society easily leads and this is because gardening is the sole and only occupation and interest of the members.

Other societies which exert an influence on their respective communities are Bayfield, Manitowoc and Oshkosh.

In order that a local society should be a success there must be back of it a strong "dollars and cents" interest, enough people in that particular locality who can see some material benefit to be derived from membership and attendance. Either this or else there must be at least one person in the community who will give of his time and energy early and late to maintain life and interest in the organization, for we have not as yet advanced to that point found in the older communities of the eastern states and European countries where asthetic horticulture, pure art, has followers sufficient to attract and hold together a local art or improvement association.

Not infrequently has the Secretary bee reminded that he was lax in his duty respecting local societies, that therein lay in a large measure the strength of the State Society. All this is admittedly true where these locals have enough local interest behind them to survive when once organized but to expend good money and no little time and energy in bringing to life a local society to see it die within a year is but cold comfort.

SUMMER MEETING.

The Summer Meeting was held in La Crosse, Aug. 25th.

STATE FAIR EXHIBIT.

The exhibit the past year was on entirely new lines comprising an extensive exhibit of spraying machinery and materials and was in every respect a success. On a platform alongside the horticultural building was shown every size, shape and type of spray pump made, from the tiny atomizer for house plants, knapsack and bucket pumps, 8 kinds of barrel pumps, to the complete gasoline operated outfit.

In a tent in the rear of this exhibit the "poison squad" representing seven firms manufacturing arsenate of lead, paris green and lime sulphur put up attractive exhibits.

The thanks of the society is due to all of the firms which helped to make up this most excellent educational exhibit. Following is a list of the different firms which exhibited:

Wallace Machinery Co., Champaign, Ill.

Complete gasoline-operated outfit on truck. Automatic (geared) outfit on truck.

F. E. Myer & Bro., Ashland, Ohio.

Two Hand Pumps mounted on barrel.

The Field Force Pump Co., Elmira, N. Y.

Hand Pump on barrel.

Morrill & Morley, Benton Harbor, Mich.

Two Hand Pumps, one on barrel, one on cart.

E. C. Brown Co., Rochester, N Y.

Hand Pump on barrel. Auto spray.

Stahl Sprayer Co., Quincy, Ill.

Hand Pump on barrel.

The Deming Co., Salem, O.

Hand Pump on barrel. Knapsack Pump. Bucket Pump. Atomizers.

The Niagara Gas Sprayer Co., Middleport, N. Y.

Gas Sprayer.

Insecticides and Fungicides. Extensive displays by The Bowker Co., Boston, Mass.

Hammonds Slug Shot Works, Fishkill-on-Hudson, N. Y.

Sherwin & Williams Co., Pullman Sta., Chicago, Ill.

Grasselli Chemical Co., Cleveland, O. and Milwaukee.

"Target Brand" American Hort. Distributing Co., Martinsburg, W. Va.

Merrimac Chemical Co., Boston, Mass.

COUNTY FAIRS.

Judges appointed by this Society served at 31 County Fairs in 1909 and, in every case reported, with entire satisfaction. It is doubtful if there is any other way in which we can expend \$350.00 ,the approximate cost of the work, to better advantage.

FARM INSTITUTES.

The work has been continued along the same lines as in the past two years and our representative D. E. Bingham is again in the field expounding the gospels of tillage and spraying.

SCHOOL GROUNDS IMPROVEMENT.

A new line of work was inaugurated during the past year, the improvement of the rural school grounds of Wisconsin. At the Jan. 1909 meeting of the Executive Committee the sum of \$500.00 was appropriated for this work and following a plan outlined by the committee four schools were selected for improvement as follows: Branch, Manitowoc Co.; Sevastapol, Door Co.; South Lancaster, Grant Co.; Lyons, Sauk Co.

In each case trees and shrubs were planted after plans furnished by the Horticultural Dept. of the Agricultural College.

By the terms of a contract executed in each case the Society furnished the plan and material for planting as well as cost of superintendence, free, the school board assigning to the Society the control of the grounds so far as tree planting or renewal of trees and plants is concerned for a period of ten years.

These schools and others which may be selected are to be used as object lessons or demonstration centers in the same way as our demonstration orchards. The plan is comprehensive and if in ten years we are able of accomplish as much toward the beautification of the school grounds of Wisconsin as we have in fruit work by our trial orchards, we will have cause for gratification; if ten or twenty years hence the rural schools of Wisconsin shall have changed in aspect from the utter neglect and desolation which now characterizes so many of them, to brighter, cleaner and more cheerful surroundings, the members of this Society may have a just cause for pride in knowing that the work was started by this organization.

BULLETINS.

Two bulletins were issued during the year as follows:

No. 15. Spraying, 32 pages, 17 illustrations, 2,500 copies.

No. 16. The Oyster Shell Bark Louse, 12 pages, 1 illustration, 1,500 copies.

During the year over 5,000 letters and 25,000 circulars in addition to bulletins were mailed from the office of the secretary. A very large number of the letters were in answer to questions from members and others who have troubles. No question has remained unanswered.

So much for the past year, one of encouragement and progress; what of the coming years? As a rule prophecy is an unprofitable and thankless task but with the experience of fifty years back of us we are, perhaps, justified in using that past as a basis for judging of future developments.

We have accumulated a vast and a valuable fund of experience in that time; we know now what we can raise and what we cannot raise; we know better where fruit may be grown in the state and where it cannot be grown profitably; we know *how* to raise fruit, how to cultivate, how to spray and how to prune.

We are then fully equipped and with our knowledge and resources should make a tremendous advance within the next ten years in commercial fruit raising.

Wisconsin within ten years should produce more fruit than is now produced in Michigan or Illinois. Within ten years our production of apples should rise from the 250,000 barrels of 1909 to 2,500,000 barrels in 1920 with cherries a close second. Strawberries and bush fruits should increase in like proportion.

All of this and "much more than twice all this" can be done if we set about it. Wisconsin effers the opportunities, we need only faith, abundant, abiding faith and we *must* succeed.

For those who doubt that fruit raising can be made profitable the followng reports for 1909 are given for the purpose of strengthening their faith.

APPLES.

Richland County.

1¹/₄ Acres Wealthy, 130 bbls. @ \$4.50 a barrel, \$585.00. 7 Acres, 5 varieties, 450 bbls. @ \$4.50 or \$2,250.00.

Sauk County.

30 trees, Fameuse, net return \$220.50.

14 trees, McMahan, net return \$91.00.

Marathon County.

1 Patten Greening tree Wausau orchard $14\frac{1}{2}$ bus. @ \$1.00 per bu. \$14.50.

CHERRIES.

Door County.

8 Acres, 700 trees, 3,529 cases @ \$1.15 or \$4,058.35.

600 trees, 3,449 cases @ \$1.15 or \$3,966.00.

300 trees, 1,750 cases @ \$1.15 or \$2,012.50 trees all twelve vears old.

STRAWBERRIES.

Sparta.

1 Acre, 500 cases @ \$1.15 or \$575.00.

Average of 500 acres \$172.00 per acre.

These are not *quite* up to the figures from the irrigated and smudge pot regions of the West but neither is the investment so great.

A prospectus of one of these western development companies offers land at \$450.00 per acre. For this sum the company agrees to furnish 80 trees per acre, plant and cultivate for a period of 5 years.

The same thing can be done in Wisconsin in a dozen different counties for less than \$150.00 per acre including cost of land and assuming cash to be paid for all labor.

The owner of 80 to 100 acres of farm land can plant 20 to 40 acres of orchard on this farm and by judicious cropping and manuring bring it to profitable bearing without a cent of expense beyond original cost of trees. The orchard should begin bearing at 6 years and the crop the tenth year should pay for the entire investment, land, trees and labor to date.

These statements are not simply wild guesses but are founded on estimates submitted by five of the best informed fruit growers in the state.

I have here outlined in this rambling way the activities of the society for the past year and having thus fulfilled my duty to you I should rightfully close that you might take up other matters of more importance and interest but I cannot refrain from expressing to the officers of the society, the members of the Executive Committee and not least of all to the membership body my sincere, heartfelt thanks for the courtesies and kindly feeling throughout the year.

The path of the Secretry is not always strewn with roses. Not seldom does his duty lead over new and untried ways that must be cleared of obstructions. Not always does the Society bask in the sunshine of legislative grace for occasionally as during the last session, our law makers, actuated by a sense of misdirected economy sought to reduce our appropriation. It is at such times as these that your secretary feels most keenly the poverty of human speech, first to express properly an opinion of legislators who are so prompted and again to express to you, fellow members of the State Horticultural Society, something of the overwhelming sense of gratitude for the loyalty of the officers and members of this Society.

With this spirit of loyalty we cannot but win the respect of all the people of the state, we cannot but augment our strength and usefulness until we rank in numbers as we now rank in strength and usefulness the most influential factor in shaping the destinies of horticulture in Wisconsin.

REPORT OF SUPERINTENDENT OF FIELD WORK FOR 1909.

F. CRANEFIELD.

The trial and demonstration orchards, 10 in number, may all be reported as in good condition. As it is unlikely that the members will be interested in hearing of the number of trees which died and have been replaced, the number of times each orchard was cultivated, etc. ,such details will be omitted from this report and remain on record in the office of the Secretary. I offer instead a brief outline of the progress of the work at the different places.

POPLAR: The tile drains work perfectly and trees show marked improvement. The variety list grows smaller and smaller with each succeeding season; the following kinds having entirely disappeared: Newell, Fameuse, McMahan, Golden Russett, Tolman, Plumb Cider, Astrachan, Ben Davis, Pewaukee, Fall Orange, Seek-no-Further, Utter, Scott Winter, McIntosh, Willow Twig, Lily and most of the Longfield and Northwestern.

The varieties which persist and thrive are, Duchess, Wealthy, Hibernal, Patten Greening, Okabena, Malinda and all of the crabs including Briar, Sweet Russett, Martha and Hyslop.

I am inclined to believe that our variety testing at Poplar has been fairly well done, that we need carry it no further and that the list just given comprises about all in apples that may be grown in the Superior Red Clay region.

MAPLE: The orchard is doing as well as can be expected with the intermittent care it receives. This is the faul of the Superintendent and resident manager jointly. It is too early to give any conclusions or to form any comparisons between this and Poplar.

BARRON: The Poplar story is being retold at Barron. McMahan, Wolf River, Northwestern, Longfield, Fameuse, Tolman, Utter and McIntosh are rapidly disappearing while Duchess, Wealthy, Patten and Hibernal are thrifty.

Much yet remains to be told at Barron.

MEDFORD: A change of contract at Medford has exerted a marked influence on the orchard. With more thorough cultivation the orchard has improved wonderfully and we may soon expect to get returns from this orchard.

STURGEON BAY: This orchard leased Jan., 1908, for years has fulfilled all of our expectations. The entire expense for pruning, cultivation, etc., for the season amounted to but \$44.50, rent \$45.00 making in all \$89.50.

The crop brought \$312.48 net the entire expense of picking, packing, barrels, freight and commission being deducted. This leaves a clear profit of \$223.00 for the year 1909; deducting from this the rent and care for 1908, when we had no income whatever there still remains a net gain of \$113.25 on this little piece of rented orchard and now that we have the orchard in good working shape the returns should increase rapidly. I estimate that the Society will clear \$1,000.00 on this transaction by the time our lease expires in 1914, or quite enough to buy the land.

WAUSAU: Nothing can show more clearly the rapid development of this great state of Wisconsin than the history of our trial orchard at Wausau.

When this orchard was established in 1897 several of our members and many more outside of the Society considered it a

88

piece of rank foolishness as the idea of raising apples as far north as Wausau seemed too ridiculous for serious consideration.

We have now proved beyond any doubt whatever that good apples can be grown profitably in Marathon County. I might give you in detail the history of this orchard since 1904, and write at length about the splendid crops of fruit in 1905-7-9 but in the end nothing more would be told than as stated "We have proved beyond any doubt whatever that good apples can be grown profitably in Marathon County." The full significance of this can only be realized by those who know the extent of the wonderful "cut-over" and hardwood regions of Central Wisconsin. There are millions of acres of land in Central Wisconsin as good or better orchard land than that on which the Wausau orchard is located. The story of the 1909 crop in this orchard will be given in full by Mr. Marsh who purchased and handled the crop. When you learn from his report of the interest shown by the people of Central Wisconsin I have no doub? you will agree with me that the Wausau orchard has been worth many times its cost.

GAYS MILLS AND MANITOWOC: Of these two orchards there is but little to be said at this time. The losses were very slight the past season, all trees made a thrifty growth and the orchards are promising in every particular.

One acre of grapes was added to the Gays Mills plantation last spring. The following varieties were planted: Moores Early, Concord, Worden, Brighton and Niagara.

SPARTA: We have not met with any startling degree of success so far in the Sparta vineyard but we hope for better results in the future. Owing to a combination of unfavorable circumstances it was necessary to renew nearly one-half of the plantation last season and considerable of the new setting failed to start this year. A portion of the vines should bear next year and one or two years hence we should be marketing grapes from Sparta.

NEW ORCHARDS.

WHITEHALL: Two new orchards were located in the summer of 1908 by the Trial Orchard Committee. One of these is on the farm of the County Insane Asylum about 2 miles from Whitehall, the county seat of Trempealeau County.

The orchard comprises five acres and was planted May 7th, 1909, one acre each of the following varieties: McMahan, Oka-



Showing the location, acreage and date of founding of each of the trial and model orchards of the Wisconsin State Horticultural Society. Location of rural schools improved in 1909, indicated by +



bena, Hibernal, Wealthy and Duchess, set 24x24 ft. or 75 to the acre. The McMahan and Okabena stock from the Jewell Nursery, Lake City, Minn., the remainder from Great Northern Nurseries, Baraboo, Wis.

LAKE GENEVA: This orchard is located on the farm of Hobart M. Hatch about four miles east of the city of Lake Geneva. The orchard consists of one acre each of the following kinds: Mc-Mahan, Fameuse, Tolman Sweet, Wealthy and Duchess. Trees set 24x24 ft., 75 per acre. Planted May, 6th, 1909.

REPORT OF CHAIRMAN OF TRIAL ORCHARD COMMIT-TEE.

D. E. BINGHAM, Sturgeon Bay.

The Committee on Trial Orchards with the exception of Mr. Coe started on our annual tour of inspection Aug. 8th. The first orchard visited was Barron.

The condition of the different varieties there was about as follows: Duchess fairly good, some winter killing, blight, etc.; Wolf River and N. W. Greening about the same as Duchess; Tolman, Windsor and Lowland bad condition; Wealthy good; Fameuse fair; Hibernal good; Dudley good; Zettle and Lily good; Patten fair. Plums very good; cherries fair. New (1908) planting fairly good except all show slight winter injury in wood, which may be outgrown in time.

MAPLE: Here we found the following: N. W. Greening no good; Scott N. G.; Transparent good; Longfield, Iowa Beauty fair; Tolman poor; Utter good; Patten good. All new planting good.

POPLAR: Wealthy and Duchess good; Longfield and Newell poor; Fameuse poor; McMahan good; Transcendent good; Hyslop good, one blighted very bad; Malinda poor; Pattens poor; Okabena good; Plums look good. Some plums and a few apples. Cherries were looking as though they didn't care much. It was raining and the red clay in this orchard makes it exceptionally fine getting around in wet weather. No danger getting up too much speed in the orchard. I don't anticipate much trouble from the boys in this orchard in wet weather as long as orchard is cultivated. In a drizzly rain we looked over this orchard and

left for the next place which took us till about 12:20 that night to reach.

MEDFORD: This orchard at Medford is in excellent shape as far as appearance goes. Mr. Harris has it looking like a garden and a well kept one, too, but the trees show some weak points. Uneven in size, etc., but as a whole this orchard looks good. A few bushels of apples on the trees. From here we went to the Wausau orchard and found everything looking good. Good erop on most 'varieties and with the exception of a few weak trees the orchard looks fine. Your Committee arrived at Wausau 3:40 P. M. and drove to orchard, walked up and down the rows with pencil and paper and estimated the crop and got back to hotel for late supper, then worked till 11:15 on the orchard proposition that was before us, then left for Manitowoc.

MANITOWOC: This orchard is located in a different country and a blind man could almost see the difference in the orchards. You will find at Manitowoc every tree in its place and looking as though it would stay there. These trees were in bad shape when planted and it will take a few summers to remedy the mistake of the nursery man that grew the tree but it can be done at that place but perhaps not at any of the other places would it be safe to try it. We found everything looking good at Manitowoc, so we left as soon as possible for Sturgeon Bay.

The orchard at Sturgeon Bay showed quite a little fruit and trees looked good. Report of Secretary will show up the results of this orchard.

THE 1909 CROP IN THE WAUSAU TRIAL ORCHARD.

W. H. MARSH, Antigo.

I wish to submit the following report on the trial orchard at Wausau, Wis.

On August 3rd, I visited the trial orchard at Wausau and certainly found a pleasant surprise awaiting me, for it was the best showing of clean, bright, healthy fruit that it had ever been my privilege to inspect.

I found the orchard in a semi-cultivated condition, as about a 10 foot strip had been left in sod; balance in clean cultivation. The pruning was well done but I think much more wood left than was good for the fruit, or health and life of





Harvesting Northwestern Greening, Wausau Trial Orchard, 1909.



trees. I consider pruning fully as important as spraying. The spraying was very thoroughly done and showed marked results, it certainly was a strong object lesson for there was not one bu. of wormy or spotted apples in 2,200 bu. and right here I wish to state that the $61/_3$ acres of the apple portion of the Wausau orchard where the 2,200 bu. were picked possibly is one of the best showings of high grade and fancy fruit from same acreage in the history of our state.

The cherry portion of orchard was a failure this year as an acre of 13 yr. old trees produced only fruit enough for two cherry pies.

The plum portion of the orchard was not a commercial success as there were only 7 bu. on an acre of 13 yr. old trees, so will confine report to the $6\frac{1}{3}$ acres of apple orchard of producing size and age and mostly 12 yrs. old.

I placed my bid for the fruit in the orchard about Aug. 10th, in competition with several others and was fortunate enough to have my bid accepted. I say fortunate as I had a three-fold object in view and was reasonably successful in all.

1st, the financial side, which while it was not large, was very satisfactory.

2nd, I was very desirous to learn what was possible to do with our standard and new varieties by allowing them full time to ripen and develop. This was certainly a revelation to me as well as to the many visitors. Many of our trees were loaded with large, well ripened, fully developed, highly colored, spicy flavored fruit, such as would line up well with the fruit belts from either east or west.

3rd, and last but not least, we wished to create an interest among the people of central Wisconsin along lines of fruit culture and in this we succeeded grandly, as fully 3,500 people visited the orchard in Sept. and Oct. Fully 200 acres of orchard will be set the coming spring encouraged by the demonstrationof the Wausau orchard. Business men of Wausau and vicinity stated that the demonstration of what was possible to do in apple culture on some of our cheap or medium priced lands had a commercial value of \$15,000.00 to \$20,000.00 to Marathon County alone. It certainly is the highest possible type of development of our farm lands.

The orchard is divided into two parts, the commercial and

the experimental side. The commercial side contains about 20 varieties and the experimental side 55 varieties. There were 63 varieties that bore fruit and most of them made a very good showing.

I took possession of orchard Aug. 17th, and picked the Tetofsky the same day. I consider the Tetofsky one of our best first early apples. It is hardy, an early and prolific bearer and a very good eating apple. I think it better than the Yellow Transparent as it is a better shipper and does not blight. Sold readily at \$1.00 per bu. in bushel baskets.

Lubsk Queen: There were three trees of the Lubsk Queen that made a fine showing of handsome fruit but of low quality, color pure white and bright pink of waxy appearance, quality much the same as some western apples from irrigated districts. Sold at \$1.00 per bu. on its good looks.

Duchess: Commenced picking Duchess about Aug. 25th. They made a fine showing. Picked trees five times over and was well paid as I secured all fancy fruit of good size. Sold from 60c to \$1.00 in bu. baskets.

The Sweet Russett: Crab for the girl's apple. Whitney No. 20 crab for the boy's apple. No orchard is complete without these two varieties as they can be used in so many ways. They are hardy, early, annual and prolific bearers. Good market at \$1.00 to \$1.25 per bu.

Morris:. This variety we have heard very little of but made a fine showing, is a fine dessert apple and comes at a time when eaters are scarce. It is medium size, dark red striped and very good quality, sold readily at \$1.00.

Okabena: The Okabena over-bore, so much of fruit was small and fell badly, is a very fair eating or cooking apple but should be thinned to make a good showing. Sold from 25c to \$1.00 per bu. according to size.

Dudley: The Dudley did itself proud and I predict that within five years it is going to set a \$2.50 to \$3.00 per bu. box pace that will let the western boomers know that Wisconsin is on the map and is there to stay. The Dudley is very large, good shape, bright crimson stripe, quality the best, sure to win out as a fall dessert apple. Sold readily at \$1.50 and should have brought \$2.00 per bu. at orchard this season.

Iowa Beauty: The Iowa Beauty made a fine showing, is a large, well shaped apple, high colored and a good dessert apple,



This McMahon tree, in the Wausau orchard, planted in 1897, has borne three full and two light crops in the past five years. A companion tree bore 14 bushels in 1909.



Eight McMahan apples and one peach. Wausau orchard, Oct., 1909.



but not a long keeper, comes to its best forepart of Oct. Good seller.

Peerless: The Peerless has not received much attention or consideration in this part of the state, but was an attraction this season and proved itself worthy. It was the most uniform in size of any apple in orchard. Nearly every apple fancy, very desirable as a box apple, is very good size and shape and high crimson color and excellent as a dessert apple. I think it is worthy of a place. Sold readily at \$1.25 per bu. and \$3.50 to \$3.75 per bbl. Would easily have brought \$2.00 to \$2.75 in bu. boxes this season on city markets.

Wealthy: The Wealthy is a wide-awake business apple of great value but much abused. It is allowed to overbear and seldom left on trees long enough to come to full development. If allowed to take true color and ripen would readily bring \$1.75 to \$2.00 per bu box. Sold some at \$1.50 this season at orchard in baskets.

McMahan White: This great commercial apple did itself proud this season. Picked as high as 14 bu. from 13 yr. old tree, 95% fancy and sold at \$1.00 to \$1.50 per bu. and \$3.50 to \$4.00 per bbl. On account of fine juicy texture, is an ideal cooking apple and a very fair eater. Is a large white apple with pink blush and transparent waxy appearance. They would grade so as to make a fancy box apple for any market. A commercial orchard should contain 20% McMahan White if packed in boxes.

Patten Greening: Only part of the Patten Greening bore this year but those that produced made an excellent showing. Picked as high as $14\frac{1}{2}$ bu. from a single tree. They are large, light green with a crimson blush, a very showy apple of good quality, an excellent cooker and very good eater. Sold readily at \$1.25 per bu. and \$3.50 to \$3.75 per bbl.

Utters' Red: The Utters bore a good crop of fancy fruit, was good size and well colored. As it has a very spicy flavor it is a desirable dessert apple. Was one of our good sellers, \$1.00 to \$1.25 per bu. \$3.50 per bbl.

Seek-No-Further: The Seek-no-furthers bore a heavy crop of high colored fancy fruit of excellent quality. On account of size, quality and color it would make a desirable box apple. Sold readily at \$1.25 per bu. and \$3.50 per bbl.

Wolf River: The Wolf River on account of poor quality has

had hard lines to make and keep friends but it certainly did itself proud this season. Fruit was very large and well colored so was one of the attractive spots of the orchards. Sold readily at \$1.25 to \$1.50. The Wolf River if left until ripe on trees, then placed in cool cellar until about Jan. 1st is not a bad apple to bake. It will prove itself better than some of the western fruits if given a place.

Malinda: The Malinda is a good annual bearer, small but a handsome pear shaped apple, yellow skin and crimson blush, almost sweet, quality fair, not very juicy. It is hardy and very desirable on account of its excellent keeping qualities. March to April.

Avista: The Avista made a very fair showing this season of medium sized fruit, color dark green and slightly striped, very good quality. Is desirable as a good keeper. March to April.

Hibernal: The Hibernal bore a very heavy crop of illshaped fruit. I consider it one of the least desirable of any tried out in orchard. They are about size and shape of the Duchess but of poorer shape and quality. Sold at about $\frac{1}{2}$ price of other standard varieties. 50c to 75c per bu. In bbls. they do not keep well as they develop small black spots in ripening. Very hardy.

Longfield: Small but sound, 75c to \$1.00 per bu.

Wendorff: Is a Marathon Co. product. Tree bore a heavy crop of very handsome fruit. It is a large, shapely apple of transparent yellow and red blush and very good quality as a cooking or desert apple. November to December. A good seller.

Newell & Dominion Winter both made good showings and fruit sold very readily at an average price.

Eureka certainly is an apple worthy of note and is one of our best types of sweet apples. It is a heavy bearer of the cluster type, a good sized fruit, green with red stripes, a sweet apple of quality and a good keeper.

Alma is also a good sweet apple but smaller in size and not the quality of the Eureka but a good keeper.

Milwaukee made a good showing of fruit, fair quality, color green skin and red stripes. A good keeper.

Virginia Crab did itself proud, fruit large and very high color. On account of its high color, excellent keeping qualities and free from blight, I consider it superior to our old faithful, the Transcendent. It matures about one month later than the Transcendent. It is very hardy, strong and rapid grower and one of our best trees to top work. Sold readily at \$1.00 per bu. at orehard.

N. W. Greening. Last but not least the N. W. Greening. This grand old apple has not been fully appreciated as no home garden or commercial orchard is complete without the N. W. Greening. While it is not a high quality apple it is a good cooker and fair eater, when it is allowed to ripen off in a cool cellar and will compare well with others on market at that time and better than most of them. Will keep until April or May. It is a large, light green fruit, with a red blush and very uniform in shape. Sold readily at good prices. Give the N. W. Greening a chance in either home or commercial orchards.

I wish to state in closing that I visited the land show in Chicago and saw the crack display by the Hood River Valley Association and while it was a very fine display, the Wausau orchard could have made an exhibit of Wealthy, McMahan White, N. W. Greening and Wolf River just as uniform in size, of a larger type and superior in quality to those shown by our western boomers.

Our 1910 Motto: Fancy Wisconsin Apples selling readily at \$2.50 per bu. box.

The President: I notice Mr. Marsh gave two lists, one of those looked on as commercial varieties and the other as experimental. I take it for granted that the Dudley at that time was classed as experimental, and he would now remove it from the experimental to commercial.

Mr. Marsh: The Dudley would go as a commercial apple, I did not put it among the experimental.

GARDEN OF EDEN.

G. W. REIGLE, Madison.

I must confess that I never approached any report with more anticipated pleasure than I have in the preparation of this report, the facts for which were obtained during my journey to Eau Claire and Chippewa Counties in the early days of October last.

Old-fashioned honesty constrains me to acknowledge the courtesy and the interest manifested by the little Dutch Giant of the Chippewa, the Hon. C. H. Daub of the 2nd Eau Claire Assembly district. He it was who urged upon your representative the hospitality of a well-appointed and cultured home where every known food grown in the torrid and temperate zones graced and burdened the banquet board, where for the time being his amiable wife and family became as it were a bodyguard for my safety and comfort.

He it was who made it possible for me to visit about twenty farms with orchards in the short space of two days.

You should also know why this trip was undertaken so you may judge whether our investigation was a legitimate expenditure of public money.

At six o'clock P. M. Sept. 29th, Secretary Cranefield telephoned me to meet him at the North-Western Ry. station, saying he had an important message for me. The message was that he had received discouraging reports announcing the ruinous prices at which choice Duchess and Wealthy apples were selling at in the cities of Eau Claire and Chippewa Falls.

He said that he considered it his duty and the express business of this society to investigate the report and if found to be true, to inaugurate measures which should result in furnishing to the growers a remunerative market elsewhere and informed me that I must go for he could not. Accordingly at six o'clock the next morning I was well started on my way toward an undiscovered garden of Eden.

On investigation I found that from Sept. 30th to Oct. 3rd, inclusive, good apples in the cit_y of Eau Claire were retailing from the stores at from 30 cents per peck to 45 cents per peck.

The price to the growers for the same apples was not less
than \$1.00 per bushel nor more than \$1.15 per bushel. I learned that choice Duchess had not been sold for less than 75c per bushel, Eau Claire market, that the common run of Duchess had sold as low as 65c per bushel.

Looking northwest from Eau Claire across the flood plains of the river a distance of three or four miles one may plainly see the Eau Claire Asylum, about one mile nearer the city lies the farm of Mr. Andrew Moholt who has ten acres of bearing orchard and twenty-five acres of recent planting. The location is on the first terrace above the river valley in what I would call an exposed position on ridges whose slopes face the east and north.

The chief varieties grown in this orchard are the N. W. Greening, Patten, Yellow Transparent, Duchess, Tetofski, Whitney No. 20, Wealthy and Wolf River. Up to this time, Mr. Moholt needs but little advice from anybody on the subject of how to grow apples profitably in Wisconsin. Mr. H. A. Donaldson has a small but very promising orchard of sixty trees bearing fruit high in color, above normal in size and free from scab and worms. Mr. T. S. Lee's two acre orchard is perhaps, all features considered, the most profitable small orchrad visited in Eau Claire county. Here I found N. W. Greening, Fameuse, Scott's Winter, Wealthy and Wolf River. To my mind the points of superiority were, uniformity in size, their wonderful coloring, and their unusual size and an added charm I cannot describe. Mr. Lee told me that the profits of this small orchard paid all the current yearly expenses for operating his farm. Mr. Lee's methods of picking and marketing his apples for local trade can hardly be improved. He gathers his apples in baskets or in bushel crates where they remain until they are sold to the consumer, empty packages being exchanged for those filled with fruit after the usual fashion with strawberries.

This method, you see, obviates repeated handling and the consequent bruising of the fruit.

The orchard of Hans Johnson is located on the north slope of a very steep hillside being sadly neglected of late years. Through the center of this orchard are two long rows of bearing but nearly worthless seedlings, sold to Mr. Johnson for Wealthy and Duchess. The Hyslop crab growing on this hillside were nearly as large as the normal Whitney No. 20, not a worm, no curculio.

7-H. S.

Following are the names of some of the men whose orchards are variable in size, none of which differ materially in their general characteristics, all bringing their owners a fair return for the capital invested:

William Wilson, J. M. Vance, August Alf, Charles Wiese, W. H. Aude, Richard Wolf and John Eggers and Chas. Stei.

Just outside the city limits north of Eau Claire lies a small farm the development of which deserves brief special mention.

Fifteen years ago this farm was a wilderness of sand covered with scanty grass, scrub-oak and jack-pine. To-day the owner who had formerly been a lumber jack, and without farm-life experience purchased this land because it was all he could pay for.

Fifteen years of privation and hard labor by himself and family have resulted in comfortable farm buildings; eighty acres under cultivation, 400 apple trees growing, 50 of these bearing, an abundant harvest of choice fruit; a fine grove of the cultivated Americana plum which bore well, the fruit bringing 6c per qt. in the market.

Besides this I noted an acre of strawberries; one-half acre of cabbage and two acres of blackberries; a span of horses, a cow and two lively boys who had already proved how capable they were by capturing premiums in a corn contest at the Eau Claire County Fair.

The nucleus of this garden of Eden has been adequately described by my friend Mr. Melville. I verily believe, if Adam and Eve were actually driven out of the garden, that the imposed expulsion was merely a period of probation which should end as soon as the twain should be able to raise Wealthy apples of their own successfully.

Certain it is, that the cycle of purgatory is now complete and that the descendants of our first parents have returned to the garden and no snake to this day has appeared in any real apple garden in Wisconsin.

The prospect for Wisconsin apple growing brightens. In nearly every instance apple growing is pursued in conjunction with diversified farming; a wise procedure for any person who has not fully decided what branch of agriculture he is best equipped for.

There exists almost everywhere in this state an undercurrent of distrust begetting indifference toward the apple orchard. Evidently this element of distrust is not confined to Wisconsin





Malinda tree, Wausau Orchard, 1909.



WINTER MEETING.

but actually exists in Canada, Penn., Mich., and New York. With the exception of the Pacific states and possibly Missourn and Arkansas, there is no concerted movement toward making the apple crop the main crop.

In the orchard named above there had been no spraying for rot, blight or the codling moth; no clean cultivation; trees growing in sod with more or less rubbish, straw, etc., for a mulch; an indifferent and careless method of handling the fruit and yet we who live in the wormy belt are confused by the marvelous results attained where our so-called modern treatment of orchards is wholly ignored.

In these counties singled out for special consideration and in nearly every other county of our state the expansion of the apple orchard is an assured fact.

This progressive movement our Society hails with delight for we are positive that no man who will use ordinary judgment in selecting fertile ridges with limestone as the basic rock and who will post himself regarding the varieties of apples to plant and who will acquaint himself with the few necessary facts and principles of spraying and cultivation need worry one moment over the results of a venture in apple growing in Wisconsin.

Jan. 10th, 1910.

A CHIPPEWA COUNTY ORCHARD OF 60 ACRES.

JAMES W. MELVILLE, Chippewa Falls.

My orchard is in what is known as the Melville Settlement, about nine miles Southeast from Chippewa Falls. This settlement consists of about four sections of land on the divide between the Chippewa and Eau Claire rivers. The land is rolling and the general elevation is over one hundred feet above the surrounding country. The soil is a fine porous clay on the hills, and in the valleys it is a dark loam, with a dark porous subsoil, which affords natural drainage. This land was formerly covered with a heavy growth of timber.

The planting of apple trees in the Melville settlement began about forty years ago.

My first planting consisted of 500 trees. 400 of which were Duchess, 50 Wealthy, and 50 crab trees. These trees are now

twenty years old. I also bought at the same time 1,000 root grafts, from which I raised 300 good trees. I planted them twenty feet apart each way. I cultivated them for three years and after that I seeded the orchard down with timothy and clover, and mulched the trees well with straw manure.

My next planting was nine years later, and consisted of 500 Wealthys. These trees I planted in rows thirty feet apart, and the trees twelve feet apart in the rows. All the rest of my orchard has been planted in the same way.

In 1900 I planted 600 more Wealthys.

In 1901 I planted 1,000 more trees, of which 600 were Wealthys, 250 were Northwestern Greenings and 150 of other kinds.

In 1902 I planted 800 more Wealthys, and 200 crab trees.

In 1903 I planted 1000 more Wealthys, 50 Patten Greenings, 50 McMahons White and 100 of other kinds.

In 1904 I planted 100 more Wealthys, and these were the last I planted.

The orchard now consists of 5,800 trees, covering 60 acres of land. The trees were all mulched when planted, and have been kept in mulch ever since. Crops of grain and hay are raised between the rows of trees, which are very little in the way of putting in or of harvesting the crops.

None of the trees have ever been sprayed, but I intend to try spraying next year.

During the last two seasons black spots have appeared on some of the Wealthys, and they drop off earlier than the rest of the fruit and will start to rot. I intend to try spraying to prevent this, but have not yet determined what spray to use, nor what is the cause of the trouble.

Our late apples, Wealthys, Greenings and other kinds, we sell in our local markets at Eau Claire and Chippewa Falls. Of the Duchess we ship part of the crop, and we are shipping more every year, as they will not keep very long.

I also desire to express to this society my appreciation for the many benefits I have received. I have read all your reports for the last 20 years. I have never planted any apple trees that were not recommended by your society. And as a result there are very few gaps between the trees. Your recommendation of the Wealthy has added thousands of dollars to the value of my orchard.

100

The President: A very strong endorsement and compliment to the influence of our State Society. Now, we will listen to questions.

Mr. G. J. Kellogg: How many Wealthys have you now? Mr. Melville: Nearly 4,500.

Dr. Loope: What will you take for a half interest?

Mr. Melville: I would not sell them. When I first read your Horticultural Reports, you recommended the Wealthy as a market apple and a cooking apple, and I said that was the apple for me to plant. I planted others in an experimental way, some proved all right and some have not.

Mr. Palmer: About what time does the Wealthy ripen there? Mr. Melville: It does not ripen the same every year, usually in October. This year a snow storm in October caught me with 700 bushels of Wealthys on the trees; it hurt the greenings and hurt all the pale-colored apples, but the Wealthy and other red apples it did not hurt at all.

Mr. Palmer: Do you Wealthys all ripen at the same time, or do you make more than one picking?

Mr. Melville: I make three or four pickings.

Mr. Bryant: I understood you planted your trees thirty feet by twelve feet, is that correct?

Mr. Melville: That is correct.

Mr. Bryant: We in Illinois think that is pretty close for trees in a row.

Mr. Melville: It would be close for a Northwestern Greening, or a large tree; I know my Wealthys were planted pretty close in some places, but they grow just as good crops.

Mr. Bryant: Do you ship your apples out, Mr. Melville?

Mr. Melville: We ship the Duchess out, because they overcrowd the local market, but we do not ship Wealthy out, because we cannot supply the local market.

Mr. Bryant: For how much did they sell?

Mr. Melville: Never sold them for less than a dollar.

Mr. Bryant: What has been your average price for the Duchess?

Mr. Melville: Never sold them below 75 cents. We started in at \$1.00 but they got down to 75 cents before the season was over.

Mr. Knight: Does your Wealthy overload?

Mr. Melville: It does when it is old, but the young trees bear fine fruit.

A Member: How many years old are your Wealthys before they bear?

Mr. Melville: About six years, bear a paying crop at six years, and very nice fruit. Some years I hear some people say they drop off frequently, I do not find that fault with the Wealthy.

Mr. Reed: How old are your Duchess trees?

Mr. Melville: My Duchess trees are twenty years old. Ten years are the oldest Wealthys, there was a thousand bushels on four acres.

A Member: You have not got to shipping Wealthys yet out of the home market?

Mr. Melville: We have plenty of chances to ship them, but so long as we can sell them at home we do not want to ship them.

Mr. Daub: It is the finest orchard I ever saw, not excepting Yakima Valley or the Pacific Coast where I have been.

Mr. Melville: My Northwestern Greenings are only eight years old and they bore two or three good crops.

A Member: Have you lost any Northwestern Greening trees by winter killing?

Mr. Melville: No, the second year I planted them out there came a cold, dry year and the neighbors lost a few, but mine were too young; they looked pretty sickly, but came through all right. Then in a couple of years they started bearing.

A Member: About at what age do your Duchess come into bearing?

Mr. Melville: About six, and the Wealthy also.

A Member: Do they not nearly touch in the row when they are twelve feet apart?

Mr. Melville: No, not at six years. My oldest orchard is eleven years and they are beginning to touch now.

Mr. Palmer: Are your Duchess that close?

Mr. Melville: No, my Duchess are twenty feet apart each way. I would not recommend that to anybody, because when they get old you cannot drive through.

Mr. Palmer: You would not recommend setting Duchess twelve feet apart?

Mr. Melville: No, they ought to be sixteen feet apart at least.

102

The President: How long will you keep up the hay in your orchard?

Mr. Melville: As long as I can. I have a number of crops, a rotation, just the same as if the trees were not there at all. I raise a couple of crops of grain, turn that under, seed down, then turn that under.

The President: Do you take the hay off?

Mr. Melville: Take the hay off, but I put a mulch around the trees, always keep them well mulched.

Mr. Bryant: Do you not use fertilizers?

Mr. Melville: I have hauled hundreds of loads of manure from Chippewa Falls.

Mr. Richardson: How do you like the Tetofsky?

Mr. Melville: Like it very well; tried to get three or four hundred trees from one nursery in New York, they did not have any.

Mr. Palmer: Will they make a tree of any size?

Mr. Melville: Trees are small, but you can plant them close together. They are a nice, hardy apple.

A Member: Do you spray your trees?

Mr. Melville: No, I never sprayed them but last year and the year before, the Wealthys had a few black spots, they dropped off the trees a little bit earlier and if you take them to market they will not keep. I think I will spray next year.

The President: Have you any codling moth?

Mr. Melville: No, we don't hear anything about worms of any kind.

Mr. Reigle: I take it for granted that what I said this morning was not understood or heard, or that I was not believed. I did not call this man up to swear to all I said. I said there was not any scab, no curculio and there was no blight, not anything, except just the finest apples I ever saw. I would like to tell you, but you would not believe if I described what I saw in Mr. Melville's orchard. I thought when I went up in that country I made a discovery, I thought I had run right into a real Garden of Eden.

The Secretary: How much do you estimate it cost you to produce your orchard?

Mr. Melville: It never cost me very much because I raised good crops on the land all the time.

The Secretary: Did it cost you anything?

Mr. Melville: Yes, the price of the trees and trouble of manuring during that time, hauling a lot of manure on, was the main cost, never cost a great deal in cash paid out.

Mr. Daub: What is your subsoil?

104

Mr. Melville: Our subsoil is deep clay loam, it does not change. When we dig a well, we have to dig thirty feet before you strike water. That land is so solid and hard you would not have to curb a well, it is as hard as rock.

THE STANLEY DISTRICT.

C. L. RICHARDSON.

A portion of the surrounding country that I wish to speak about this afternoon is to the east of Chippewa Falls and Eau Claire; it is along the Wisconsin Central Line, 25 to 35 miles to the east. The country over there is a clay loam, or a loamy clay, a great deal similar to the country that has been described by the two gentlemen who have preceded me. It is not at the present time an orchard country, but in the vicinity of Stanley there are numerous small orchards ranging from a few acres to five or six acres, and off to the north there is a large amount of country that is almost a wilderness, which is probably not adapted to orchards at the present time, but which will be as the country becomes cleared up. South of the tract the country is more cleared up and there is where most of the orchards are. The section extends from the northeast corner of Chippewa County over quite aways into Taylor county, and running south of the tracks, projects for a ways into the northwest corner of Clark county. They had a little County Fair at Stanley this year, and 294 plates of apples were shown, all grown within a radius of eight or ten miles of Stanley, and they showed that at present at least there do not seem to be the insect pests and fungous enemies that are common in other sections. The fruit that was shown at the Fair was of high quality, large size and good coloring, and there is a great deal of the land in that section which I think is adapted to raising apple trees and which would be good strawberry country.

In regard to the prices of our land, any person who wishes to go into that country and start an orchard will not have a great

deal of difficulty in getting land at what would seem to be a very reasonable price as compared with what is to be found in many. sections. The cultivated lands there run in price all the way from \$40 to \$75 per acre, and the wild lands are perhaps as low as \$10 or \$12, and up to \$20 per acre, so that it would not entail great expense upon any one who wished to go into the country and go into the raising of fruit. A great deal of this wild country of which I speak has been logged over, but there is a great deal of small timber left on it, so that many of the people who have gone in there have found that the amount of material that they are getting off the land is aiding them very materially in their efforts to pay for the land. The section north of the tract has good railroad facilities. There is the Wisconsin Central running east and west along the southern border of this section of which I have spoken. It is cut diagonally from northwest to southwest, by the new extension of the Soo Line to the head of the Lakes, and a local logging road starts about forty miles up in the country, cutting it from southwest to northeast. so that any one wishing to go in there would find that while it is virgin country, that they would still be in close touch with civilization.

One last fact I might perhaps present, and that is that some of us got together this year and decided that we would put up a county exhibit at the State Fair, and among other things we had a fruit exhibit, and our fruit exhibit took second place in the rating at the Milwaukee State Fair and every bit of that fruit was grown in Chippewa County and perhaps one-half or more of it was grown in the eastern half of Chippewa County, omitting from this the apples that came from the Melville section and from the northern part of the county. From that it would seem that while only in a small way, yet that section is actually producing fruit of superior quality.

Mr. G. J. Kellogg: How much of that country that you describe is similar in soil to Mr. Melville's ground?

Mr. Richardson: While none is exactly similar, there is a considerable area of good apple land between Stanley and Hannibal. Much of the land for 6 or 7 miles north of Stanley and Boyd is adapted to orchard purposes, and also an area from Stanley to Thorp and 7 or 8 miles south of Thorp—making 8 or 10 townships in all.

A Member: What varieties are you raising?

Mr. Richardson. At the Fair, this year we had Wealthy Duchess, Northwestern Greening, the finest Patten's Greening that I ever saw in my life; we had McMahan's White, they were very fine; practically all of the crab apples that are grown in the northern part of the state, the Peerless, the Dudley, Russett, Malinda and a few others. In all, I presume there were probably thirty-five varieties.

ORCHARD TILLAGE SESSION.

Topic.

"Shall we advise clean cultivation until July 15th to be followed by cover crops for young orchards (five acres or more), or may we consistently recommend a system of cropping for five to ten years after planting? If the latter, what crops, what rotation, how many years may crops be grown, and what portion of the land may be cropped?"

PROF. J. G. MOORE.

Orchards of five acres or more are commercial plantations so that our question refers to handling a commercial orchard. As the apple is the chief fruit in this state, it also presumably applies to apple orchards. Two points immediately arise in considering the question: the result on the trees, and the cost of bringing the orchard up to the producing period. From the stand point of the tree alone, I believe that a system of cultivation with cover erops most advisable for the welfare of the orchard unless great care is exercised in the cropping. It is also essential that an amount of plant food equivalent to that removed by the crop be returned to the orchard soils.

The bringing of the orchard from planting to fruiting as economically as possible, will in the majority of instances, practically preclude the clean culture-cover crop system up to the time at which the orchard begins to give returns from the fruit produced. The question then resolves itself into "What is the best practice in the cropping of a young commercial orchard?"

The length of time during which a young orchard may be cropped successfully, which means without injury to the trees, cannot be definitely stated. It will depend primarily upon the age at which the trees come into bearing. I believe it to be a mistake to grow other than fruit crops in the orchard after it has reached the bearing period. It will be seen that the length of

WINTER MEETING.

time for which the orcharding will be cropped will then be much less in cases where early bearing sorts as Transparent and Duchess are used, than it will where the orchard is composed primarily of later bearing sorts like Northwestern Greening.

No small grain crops are permissible in the orchard at any period of its existence, if they are to be used for other than cover crops. The choice of crops to grow in the orchard will therefore rest between the cultivated field crops, small fruits and vegetables. The latter as a rule may be passed over without consideration. Practically all the small fruits can be grown successfully between the rows of trees in the orchard. With the field crops, potatoes, beans and possibly corn, and tomatoes when grown as a field crop rather than a garden crop, will comprise very largely the list which is permissible. The least desirable of these in the orchard is corn, the height which it attains in many instances gives too much shade, particularly if planted close to the rows, and also restricts the free circulation of air through the orchard. Good air circulation is very important as a means of keeping in check various diseases which attack the trees.

The rotation of crops in cropping the orchard is not of extreme importance especially if the practice of returning the plant food by the use of fertilizers is followed. The orchard should be cropped only for a few years at most, and the evil effects experienced in the ordinary length of time would be small. However, both from the standpoint of effect upon the orchard soil, and the return from the crop, rotation is doubtless advisable.

Personally, I believe a rotation where potatoes and beans are used is as satisfactory as any. The usual length of time for cropping an orchard of the early bearing sorts usually grown in Wisconsin should not exceed three to four years where two to three year old stock is set. For a three year rotation, potatoes, beans, early potatoes would be a good combination. Follow the first crop of potatoes with a liberal application of barnyard manure. The crop of beans may be followed by commercial fertilizers in which potash and phosphoric acid largely predominates. The early potatoes should be dug as early as possible, and then a cover crop of rye or other hardy covers should be sown. The object of the cover is to protect the soil and furnish vegetable matter to be incorporated into the soil the following spring.

In a four year rotation, beans would replace potatoes as the first crop grown. In a longer period of cropping, corn might be used advantageously providing it was kept considerable distance from the trees.

The question of the portion of land which may be used in orchard cropping is one which is open to various opinions. It will depend first, upon the distance between the trees, and second, upon the age of the orchard. Personally, I would prefer leaving a strip in a newly planted orchard of from three to four feet which would be devoted entirely to the growth of the trees. As the size of the trees increased from year to year, this space would be gradually increased. At all times it would be advisable to give to the trees all of the soil through which the roots permeated, and use only that unoccupied by the trees for the crop which is to be removed. The mistake is too often made of growing other crops too close to the trees resulting in injury to the tree which oftentimes is not merely temporary but permanent.

DR. T. E. LOOPE.

If we assume an ideal location, an ideal climate and an ideal condition of soil found in a few irrigation districts, with the five acres or more to be depended on when fully developed for a livelihood then if the pocket be well filled with shining golden eagles we should cultivate exclusively allowing neither weed, grass or other crop to grow. However I have presupposed that the problem given above related solely to Wisconsin, that the person planting the "5 acres or more" was not wholly a horticulturist and was not depending entirely for the support of himself and family upon the proceeds of this small orchard.

My idea was that it applied to the farmer who had other acres to till and that this orchard was to supplement his income and provide fruit for his family and it should supply not only fruit but enthusiasm, interest and joy while growing and delight in its beauty and fruitfulness.

Again it might be a horticulturist who had an additional 5 acres not utilized and who being a horticulturist had a surplus of enthusiasm, so much so that when he decided to plant the orchard could already, with that eye of faith so common among the cult, see the growing trees the later blossoms and lastly im-

108

agine that he was harvesting a phenomenal crop of beautiful fragrant luscious apples and I believe he even felt in his pocket for that bag of golden eagles, so vivid is the imagination of this class of people. I know for I have been there.

I would set my 5 acres of trees 20x20 or 24x24 feet apart on a suitable location—good soil well prepared. I would cultivate until July, 15th, the first year without crop of any kind, afterwards sowing to oats or rye for a cover crop. The next year I might put in three rows of potatoes, or three rows of strawberries or a similar amount of beans or any root crop but not corn.

The following year I would put in hoed crops as before, in the meantime keeping all weeds, grass or foul stuff away from the space not occupied by the crop, rotating from potatoes to another kind of crop; if strawberries plowing them up the second year, always trying some cover crop. This I would do until the 7th or 8th year when I would seed to clover, letting that remain two years then clean cultivation the next and probably the second year—then clover again and the same rotation.

With this five acres it would be likely the horticulturist to imagine that having taken care of it for six years, he could begin to get rich returns for his previous care and hard labor. He would begin to estimate the yield of fruit at ½ bushel per tree and put the price at \$1.00 per bushel. At 10 years he would estimate a barrel per tree at \$3.00 per bbl. and then some. Such estimates constitutes the riches of these men. He forgets that seasons vary and most trees bear only every 2nd year. That codling moth, curculio, hallstorms and strong winds come for the purpose of keeping him to the simple life and that, unless he plants the right varieties the trees grow and grow and "never do anything else."

If he is an ordinary farmer before the trees are three years old a large per cent of them will have great wounds where the whiffle trees have torn off a map of Panama or they will have been run over with a harrow or the blue grass sod has run in around the trees. Perhaps he will neglect to spray or prune and the fruit will be unmarketable. When his trees are 10 years old perhaps hogs bear a good price or his cows give him enough profit to pay taxes and still live economically and the whole plat is given over to pasture. He wonders when the trees die and grow gnarled and the scale attacks them and the worms eat then, up and the fruit corresponds,—why is it? Don't tell me this

is overdrawn for the half has not been told as you may observe as you passed through the country. "It is better to have loved and lost than never to have loved at all." So even at the worst it is better to have planted trees that die by slow torture than not to have planted any, for some day, some time, your descendants will absorb from nature the divine soul of some former horticulturist and will grow beautiful healthy trees and red, red apples as enticing as the girl's cheek he loves.

In the spring he will eagerly watch for the first bursting greenness of the leaves and will be uplifted with ecstasy at the first gleam of crimson that tells of the blossom. In the fairyland of the full bloom he will alore with raised hands, eyes and heart the great bounteous and boundless gifts of prodigal nature.

So plant apple trees, Farmer, and forget to crucify them in your cultivation. Forget to turn the hogs in when they get older. Try to be loving and careful of their welfare and some day in spring go out in the middle of that 5 acres and gaze at their loveliness. Listen to the music of the bees and the happy song of the birds and be glad that there is a heaven and and that you have 5 acres of it right here. Plant your "5 acres or more" horticulturist and when you are in the fairyland of blossom or full fruitage you won't need an aeroplane to raise you to such heights that breathing is almost suspended at the vision of beauty you have helped to create.

I know for I have been there.

W. S. HAGER.

I have always practiced cultivating and growing a crop between the trees. I have used almost every kind of hoed crop, even strawberries. I think I like beans the best, as they enrich the soil and do not shade, and are not so deep rooted as to absorb moisture, that in a dry season should go to the tree.

I think the most convenient crop to cultivate, that I ever used, was squashes, planted two hills between the trees one way, leaving a full row clear the other way, most of the cultivating may be done this way with two horses and a spring tooth harrow, and one horse may be used the other way.

This method I consider nearly as cheap as clean cultivation.

WINTER MEETING.

However I do not advise growing squashes unless you have the market or grow mammoth kinds for stock feeding on the farm.

In my part of the state, I have seen no necessity for cover crops, as we usually have plenty of snow, and I have always considered that a cover crop takes too much moisture from the soil, especially in a dry fall and a winter when it freezes up without rain.

The most severe winter, that I ever experienced, was preceded by a dry fall and I had a young orchard in which beans had been grown, the snow was deep, and I did not lose a tree.

I do not want to go on record as saying that clean cultivation is not advisable, as I think, under some conditions, it may be the best way. But I have found that I could grow a crop and trees at the same time, without having the crop cost more than it is worth.

However, with the average farmer, with little and expensive help, I think clean cultivation might be best, but by all means cultivate. The partial cultivation and partial mulch system looks to me like an excuse only.

W. H. MARSH, Antigo.

As my experience has been somewhat limited along this line, I will not take up the time that might perhaps be better used by others. I will say, however, that I have worked more along the grass culture line. The trees have made a very good showing, a little slower growth, perhaps than if cultivated but they are coming well to fruiting. The grasshopper proposition presented itself in a very striking manner this summer and in looking over other orchards I am well satisfied that cultivation is the proper method to be used. But as far as I have worked out the thing, I like the small cultivated crop system in preference to clean cultivation. I think potatoes and beans are all right.

D. E. BINGHAM, Sturgeon Bay.

For fourteen years we have been practicing cultivation of orchards. In that time we followed about the plan which I am going to give you. We crop our orchards from the time they

are planted, using the rotation that Mr. Moore outlined, potatoes, beans and small fruits excluding the strawberry. I would not under any consideration use the strawberry in the orchard the first year, that is, unless I was going to dig the plants for sale in the fall. The first year you get very good results, the tree does nicely, the second year you get a set back that practically puts you back more than you gained. The reason for that is, the strawberry takes a great deal of moisture from the ground and you have practically a sod condition with the excessive amount of moisture that the strawberry takes from the soil. We have practiced planting or sowing a narrow strip of peas between the rows of trees and cultivating each side with a spring-tooth harrow; we have found that is not as practical as using open culture. We have set strips of clover leaving a chance for cultivation around the trees, and still we found that in the seasons when it gets a little dry we are in need of a little more moisture by the strip of clover taking out some of the moisture that we ought to have for the trees. We find our best condition is clean culture. We do not get it always, oftentimes we have a little strip of sod, sometimes we have more than we can handle, and sod gets around the tree, say a circle of three or four feet, but we find that is not injurious to the tree, the feeding roots are out beyond that, and we have ample room to cultivate and give all the moisture that is necessary. We do not use a cover crop in the orchard. It has always been a question in my mind as to how we add fertility by a cover crop. If we use a cover crop, what do we add to the soil in the way of humus? We allow the late growth of weeds to form our cover crop, say, from the middle of August we get a sufficinet covering over the land to protect the ground during the winter. I have sometimes thought that it was better to use a crop on the land during the growing season. I believe that if you take a young orchard and continue cultivation for a number of years without any crop you will destroy or use up the humus. You have to add that in some way. I believe if I were going to use a cover crop I would have some thing that would grow luxuriously and give me something to turn under in the way of vegetable matter. The system we follow is rotation of crops like beans and potatoes. I do not like a corn crop, it is a detriment to the foliage, especially if the corn crop is high, the foliage on the trees will be poor, especially in the cherry orchard.

WINTER MEETING.

The apple orchard is under discussion, but I believe the same would be true in the cherry orchard, lack of circulation of air and you would have foliage injury that you would not have in open culture.

R. J. COE, Ft. Atkinson.

Really I do not know what there is left for me to say. Prof. Moore. Mr. Bingham and Dr. Loope have said about all that there is to say along this line but to cultivate or not to cultivate, that is the question; whether it is better to cultivate and make our trees grow and keep them healthy, or to not cultivate and let them die. That is about the way I look at it. The ideal cultivation. I take it, is absolutely clean cultivation. That is to say, absolutely clean cultivation holds the moisture in the soil, puts the soil in the best possible mechanical condition for the tree to grow; but, on the other hand, it has some disadvantages. In other words, clean cultivation constantly followed up, robs the soil of its fertility, robs the soil of the one thing that we must have in the soil to make our crops grow well, namely, decaying vegetable matter or humus. So then we are driven of necessity to the growing of some crop, or adding some material to the surface of our soil to keep our soil in the best mechanical condition. I believe that we can grow some cultivated crop the fore part of the season with very beneficial effect. We want to keep the soil covered with some growing crop almost constantly, because there is almost all the time some fertility developed in the soil by the cultivation and if we had to raise some growing crop in there, it would take up this fertility that is developed, made available and we can hold it near the surface of the soil so that our plants can get it a little later on when these roots and tops go to decay. This in brief is about my idea of whether we should cultivate or not. A few years ago-this may be a little off the topic perhaps, but it is along the same line-at the Nurserymen's Convention in Chicago, Prof. L. H. Bailey, whom everybody knows to be the best horticulturist the world has to-day, made the statement that there are more nursery trees grown and planted every year than there are bearing trees all told, following this statement by another, which was something like this: People will buy and

8-H. S.

plant trees and not care for them and they never arrive at the fruiting age. The moral was of course that if we plant trees we should care for them. The immortal Patrick Henry once said, "I care not what others may say or do, but, as for me, give me liberty or give me death." As for me, Mr. President, give me a cultivated orchard, or give me none.

L. H. PALMER, Baraboo.

Clean cultivation followed with a cover crop would be an ideal way to raise fruit if one could afford to wait eight or ten years for returns. I always had to make my land pay as I went by raising crops among my young trees.

The first year I plant to some cultivated crop, rowing both ways to save too much work with the hoe, and leaving the space next to the trees a little wide. As the trees grow lessen the amount of land cropped, thus giving more to the trees.

It is generally necessary to seed to clover every two or three years, to loosen the soil and prevent washing. Fruit trees like any other crop require plenty of fertilizer and I find my best trees are those I feed the best.

It is my belief that if there is something coming in as you go along, the average man will work his trees a little better, than if obliged to wait eight or ten years for the first crop. This method of cultivation gives me good trees free of cost at ten years of age.

I have been thinking about this bean culture, I have never tried it. I would like to ask what kind of beans they raise among the trees and how they raise them.

Mr. D. E.Bingham: We plant the common white bean and I believe we get goods results, not figuring the beans for the market. The results that we get are better cultivation and less humus loss, and we also get the crop of beans, sometimes they average fifteen to twenty-five dollars an acre in one season, it depends upon the conditions under which you can get them harvested and threshed. I believe we are coming to that method of orchard culture planting something and cultivating it without any reference to the crop that we get. A very convenient way of planting beans is to use the single horse planter, mark out the ground, then hitch the horse to the planter, then go along the mark, planting two or three beans every two or three inches, depending on the size of the beans. You can plant from one peck to one bushel per acre. We usually use about a bushel to the acre on our orchard.

The President: We have delegates from sister states whom we wish to hear from, and I will ask Mr Pratt from Michigan to speak on this subject.

Mr. Pratt: Perhaps our methods are a little different than yours in Wisconsin. I have noticed from the discussions that you are planting your trees a great deal closer than we do at the present time. We used to plant them closer, but now our apple trees are planted from thirty to forty feet apart each way. Of course we raise a great many other kinds of fruit. At Benton Harbor, down in the southwestern corner of Michigan, we raise a great many peaches. While they used to be planted, fifteen or eighteen years ago, as close as twelve, now, we are planting twenty to twenty-four feet each way and we get better crops, better peaches, more satisfactoin all the way around. As to cultivation there are two methods practiced; We have the sod mulch system, that is used only on land that is hilly and likely to wash. The trees are set on this land and it is seeded down to either clover or timothy and this is cut each season, and a large portion of that is piled around the tree so that no grass will grow under this mulch right around the tree, and the rest if it is used for grazing until the trees get big enough to take it all up. The mulch around these trees is kept up as far as the limbs of the trees reach and as the trees grow bigger, the sod mulch is stretched out farther.

In regard to clean culture methods, the first year we plant our trees in the corn field, each tree taking the place of a hill of corn and we get very good results that way, better than any other method we have practiced. After that there are various methods used, some use potatoes, same use beans, others vegetables. In the southern part of the state we have a good many small farms, five and ten acres that make a good living and every foot of ground has to be utilized, and the consequences are that we raise a great many vegetables there, as we are close to the Chicago market, and they can sell their vegetables at a

116

very good profit; but, on the other hand, on the larger farms, Michigan has learned another lesson, and that is, too much clean culture and not turning back any humus robs our soils. At the present time there are a great many farms that are depleted of humus, and the method now is, in some of the younger orchards especially, they cultivate down the tree rows a strip about three furrows wide, the rest seeded to clover. This is left about two years, the first and second crop of clover is usually taken off and what ever grows up the following spring is turned under and in that way we have got the humus back into the soil to quite an extent, but on the smaller farms where we raise the vegetables, we sow a cover crop in the fall, which grows very rapidly, and such a winter as this it will grow under the snow nearly all winter, and in the spring we will have a fine growth to turn under, which helps turn back this humus in the soil, and this method is followed out until our trees come into bearing.

Mr. President: We will now hear from Mr. Bryant of Illinois

Mr. Bryant: I want to say that while I am from Illinois I am not going to speak of Illinois practice entirely. I am going to speak from my own practice and experience, and would say that Prof. Moore's remarks at the start were very much in line with my ideas. We plant our trees thirty feet apart, and use corn for the first few years without any rotation. I would say with us that in our ordinary soil the trees do not need any stimulation the first few years, we get growth enough, we do not care to encourage more until they begin to bear, then we practice the clean cultivation the earlier part of the summer and where trees are bearing heavily we put on manure. I said we planted the trees thirty feet apart each way and in that way we can plant seven rows of corn, putting it two feet and a half apart each way, rowing both ways, and that will leave a wide space next the tree, perhaps about four feet and a half, and of course that space right next to the trees you have to cultivate with a single horse, it gives a little more air and room next the trees and a better chance to cultivate. I do not know that this question extends any further than the first few years, it does not refer to the later practice. I was going to say that we practice clean cultivation after the tree comes into bearing for the earlier part of the season and then we apply a cover crop. We think that is very essential. Our conditions of course may be different from yours here, you have more snow, but I want my ground covered during the winter time with something, and even where we put on corn, we like to sow something at the last cultivation of the corn, so that there is something on the ground after the corn is cut off. Of course we sometimes do not get very much growth in amongst the corn, and I can see that this method might vary on ground that was liable to wash, and in some places it may not be practicable to do that. I have noticed in the Rural New Yorker, some of Mr. Collinwood's experiments in planting an orchard. He put around anything, hay, straw, weeds. Now, that practice would not do at all with us, because of the danger from mice in the winter time. We have to be very particular about that and whenever I put on a cove rcrop, I am particular in the fall to have a clean space immediately around the trees, but I want a cover crop as well, because, as has been stated here before, I think you will destroy all the humus if you practice clean cultivation without returning something to the soil, something in the way of a cover crop, or a heavy coating of stable manure.

A COMPARISON OF TILLAGE AND SOD MULCH IN AN APPLE ORCHARD.

O. M. TAYLOR, Geneva, N. Y.

Among all the horticultural industries of the Empire State of New York, the culture of the apple ranks first in importance. It takes this position not only in the value of the fruit produced but also in the value of the lands devoted to this crop. Applegrowing as a business has come to receive special attention only in recent years, and is yet comparatively young, dating back no more than 50 or 60 years to the first great movement in the planting of apple orchards in New York.

In those earlier days, little, if any, careful systematic study had been made regarding cultural methods. The subject itself was new and there were no past experiences to serve as guides in regard to selection of varieties, distance of planting, pruning, enemies of the fruit and tree—both insect and fungi—or of the proper treatment of the soil to secure best results. But as the years passed experience was gained and now at the present time

we find specialists in apple-growing who are giving most careful study to each one of these subjects and no one to-day is so unwise as to set an orchard without looking into the subject most carefully in order to avail himself of the rich experiences of the past years.

It is not my purpose to note the progress made along all the subjects connected with successful orchard management. They are too many and the time too short, only one phase of the subject has been selected, namely: The relations of "Sod" and "Tillage" to the apple orchard.

In earlier years the trees were set in sod, or, as was more commonly done, were set in cultivated land which produced tilled crops for six or eight years, after which the ground was seeded down to remain in sod for a series of years, being used either as pasture or for the production of hay. As time passed many of these orchards became or continued to be unproductive until in despair the cutting down of the trees was seriously considered. The Tillage movement which was the reaction following such a condition gradually secured a prominent place until the cry of "tillage and cover crops" appeared to be the only method of procedure.

During the last ten years, however, opposition developed against this system. It was not confined to New York but seemed centered at two points; in Ohio under the leadership of Mr. F. P. Vergon, a prominent and successful orchardist under the sod or grass mulch system of apple culture, and at South Onondaga, near Syracuse, N. Y., from which place Mr. Grant Hitchings year after year exhibited at the State Fair many varieties of the finest fruit, both in size and color, carrying away numerous prizes for best plates of varieties and of collections. The prizewinning fruit came from trees grown in sod; the marked results secured here, and also from scattered orchards throughout Western and Eastern New York, created considerable discussion as to the relative merits of "Sod" and "Tillage".

These two men not only made vigorous claims but also put up the goods to back their assertions. They exhibited fruit of the highest degree of perfection. Owing to the results of Mr. Vergon, the Ohio Experiment Station at Wooster began a series of experiments in 1900, a preliminary report of which may be found in Bulletin 171 published in 1906, which is designed to be suggestive rather than conclusive,

118

The New York State Agricultural Experiment Station at Geneva secured in 1904 the use of an apple orchard at South Greece, near Rochester, in order to throw some light upon this question and to demonstrate the comparative value of the two methods under the conditions existing in those places, and to discover, if possible, the reasons for the results that might appear. The experiment was to run for ten years in order to secure fair average results. Five years have now passed and it may be of interest to note the progress of the work to the present time.

The orchard at South Greece, seven miles west of Rochester, is owned by Mr. W. D. Auchter. It consists of 9½ acres of Baldwins set in 1877, the trees standing 40 feet apart each way. The surface soil is a medium heavy clay loam. The subsoil is of heavier loam yet containing enough sand or gravel to make it porous so that the trees do not suffer from lack of under-drainage. The surface is nearly level. This orchard is typical of many of the commercial orchards scattered throughout Western New York.

Plan of Experiment. The orchard was divided into two equal divisions, one-half kept in sod—the other half plowed early in the spring, receiving from four to six cultivations during the summer until the last of July or early in August, at which time a cover crop of clover or oats was sown. The grass on the sod half of the orchard was cut once or twice each year as occasion required and was allowed to rot where it fell. The spraying, pruning and fertilizing treatments were same on each plat.

The following is a statement of some of the results obtained with both tree and fruit.

The average annual yield on the sod plat for the five years was 72.9 barrels per acre; for the tilled plat 109.2 barrels—a difference of 36.3 barrels in favor of the tilled plat.

There was a marked difference in size of fruit, requiring an average of 434 apples per barrel for the fruit from sod and 309 apples for the fruit from the tilled trees; the fruit from sod trees averaged 5.01 oz. and the fruit from cultivated trees 7.04 oz.

The fruit from the sod mulch plat was of better color than that on the tilled plat—it matured from one to three weeks earlier; it was inferior in crispness, in juiciness, in flavor and in quality.

The average gain in diameter of trunk for the trees in sod was 1.1 inches; for the trees under tillage, 2.1 inches.

The average annual growth of twigs of the trees in sod was 3.4 inches; of the tilled trees 6.7 inches. The total weight of 240 twigs from sod trees was 7.2 lbs.; from trees under tillage, 21.3 lbs.

The leaves on the sod trees were yellowish—on the tilled trees a dark, rich green.

FINANCIAL STATEMENT.

The average annual cost per acre, not including harvesting, was \$17.92 for sod, and \$24.47 for tillage—a difference of \$6.55 in favor of sod.

The average net income per acre from sod was \$71.52, and from tillage \$110.43, thus giving an increase due to tillage of 54 percent.

CAUSES OF DIFFERENCE.

Moisture. The soil to the depth of one foot showed as the average of 120 moisture determinations 156.24 tons water for sod; 235.98 tons water for tillage—an increase of nearly 80 tons in favor of tillage.

Temperature. At a depth of 12 inches the average temperature for sod was 65° ; for tillage 67° —difference of two degrees in favor of the soil under cultivation.

Humus. The amount of humus in the soil to a depth of six inches was 19.98 tons per acre for the sod plat and 21.78 tons for the tillage plat—an increase of 1.8 tons in the soil under cultivation.

The facts presented include the essential features of what happened in an apple orchard under a tillage system and under a system of sod mulch. The soil, the trees and the fruit have each in turn told their story, and the evidence is before you. Yet it must be kept in mind that the results do not prove that tillage under all conditions is the only proper method of procedure. Every orchard has its special problems and every apple grower has a problem of his own. Any method to succeed must be adapted to its environment. The relations to the plant of humus, of heat, of food, and of moisture are fundamental. It would therefore appear that the problem of the apple orchard may in a measure be solved by the application of the laws of plant growth.

Mr. Bryant: How heavy a mulch would there be in this orchard, did you manure the orchard, endeavoring to encourage growth of grass?

Mr. Taylor: The farmers in the neighborhood who viewed the orchard before the grass was cut estimated that if the erop had been removed and turned into hay, it would have averaged about two tons to the acre. Now, in regard to the method of mulching; when we were taking our soil samples—trees forty feet apart—very often we would mark the center of the four trees and dig down at that place finding roots of apple trees as large as a lead pencil; the roots were occupying the entire surface, so there was no object in gathering together the grass; it was simply allowed to rot where it fell.

A Member: Did you apply the fertilizers to the part that was cultivated?

Mr. Taylor: The fertilizer question is asked for; when the orchard was taken it was the general impression throughout New York that many of the orchards soils were deficient in phosphorous acid, and acting upon this general impression, an application of four hundred pounds of acid rock per acre was applied to the entire orchard. This was done for three years. The question was then raised, do we know that we are receiving any benefit from this liberal application? The next year, in place of applying it to the entire orchard, there were two cross rows taken, running across both sod and tillage sections, and the acid rock was applied at the same rate. Further over in the orchard two more rows were used, applying potash at the rate of four hundred pounds per acre. This was continued for two years and although at one of our summer meetings the second year of this application there were 200 fruit growers going through the orchard, the cover crop being about one inch high, yet no one was able to discover any gain in any way to the cover crop or the grass, to the leaves or to the fruit from the use of the fertilizer and since then no fertilizer has been used in the orchard. We have the orchard for four years longer and it is not our intention to apply any fertilizer, for we have apparently received no benefit from its use in this particular orchard.

A Member: What is the nature of your soil, what kind of soil?

Mr. Taylor: The surface soil, is a rich, sandy loam to a depth of about ten inches, and it is underlaid by a compact, sandy subsoil: there is good drainage.

Mr. Melcher: Is there any difference in the keeping qualities of those two samples you have there?

Mr. Taylor: In regard to the keeping qualities; the fruit on this plate, which represents the sod section, has become mealy and is not pleasant to eat. The fruit from the tillage section is from one to three weeks later; it will be in pleasant condition for eating for at least three weeks longer than the fruit from the sod plat. Now, that is not because the flavon is necessarily better. If the fruit could be tested out at the same time of maturity, there probably would be no difference, but one is further advanced that the other.

PRINCIPLES OF SMALL FRUIT-GROWING.

(Discussion following above topic, page 74.)

Mr. O. M. Taylor: May I say a word about the Perfection currant? I was greatly interested in what I heard yesterday in regard to this currant, and when your secretary sent me the program, seeing that a special report was expected from Wisconsin, I gathered together the information which we have at the Geneva Station, thinking that some of you might be interested in knowing how the Perfection currant does in New York state. The following is the report:

At the Geneva Station the Perfection currant has been grown since 1897. In bush characters it is intermediate between its parents, Fay and White Grape. The size of cluster and berry exceed that of Fay and the fruit is well formed to the tip of the cluster. The stem of the cluster is free from berries near its attachment to the plant, thus making it easy to pick. The color is slightly lighter than Fay; in flavor and quality it is superior to Fay or Cherry. It ripens about with Fay and Cherry and appears to be one of the most charming of the more recent introductions. Mr. M. S. Kellogg: I should like to ask Mr. Taylor if they have succeeded in any degree in controlling the anthracnose at Geneva with Bordeaux mixture.

Mr. Taylor: In experiments Prof. Paddock carried on several years ago he succeeded in keeping it controlled with the use of Bordeaux mixture, but it was necessary to make so many applications that the expense was so great that it was not practical and at the present time the method recommended for fighting anthracnose is planting every four or five years in new ground.

Mr. Daub: At what age is the currant wood the most prolific? You spoke of cutting out the older ones, at what age should it be cut out?

Mr. Taylor: The currants are not borne upon the new wood after the bush is about four years old, some of the older wood should be taken out each year, and each year it is always necessary to take out some of the weaker of the new growth, as too many canes will develop.

Mr. Daub: Then you would say about four-year old wood?

Mr. Taylor: Yes; it would depend a little on the natural vigor of the canes. The important point to watch is this; no crowding of the branches of the bush; you can readily determine whether there are too many of the canes developed, and from the fourth year on it is necessary to watch the bushes in regard to trimming and taking out the older wood. I believe in New York state we fail in this one particular more than we do in any other way in the growing of currants. We allow too much of the wood to remain in the bush.

Mr. Richardson: I would like to ask a question in regard to cultivation, frequent cultivation produces dust mulch and that dust mulch keeps them from drying out?

Mr. Taylor: Yes.

Mr. Richardson: Then in dry weather, in June, July and August, would you cultivate a great deal, and hoe up close to a strawberry plant, so as to have a dust mulch?

Mr. Taylor. This is the new planting?

Mr. Richardson: Yes, new planting.

Mr. Taylor: In doing this work it is necessary to have the cultivation very light, not deep, and in exceptional cases—this was true I remember nearly twenty years ago in Wisconsin, in an unusually dry season, potatoes that were cultivated I think nearly every day—were not saved by the cultivation, and in extreme cases I could see that the cultivation of the strawberry plant with its roots close to the surface might in time, if the drought continued too long, be injurious but in ninetynine cases out of one hundred, if the cultivation is light, it will do more good than injury.

Mr. Richardson: I have had the theory for several years that hoeing, if you hoe fairly deep in dry times, was liable to do about as much harm as good. One has to be very careful at that time of year.

A Member: How about pruning strawberries?

Mr. Taylor: The general practice in New York is to plant the varieties that send out many runners at quite a distance apart, planting such varieties that send out few runners closer together and very little attention is paid to the pruning of the strawberry. It is true that in a great many strawberry beds there are too many weeds, and when there are too many strawberry plants, a strawberry plant out of place is a weed; that is one of the troubles why we have so many small strawberries, there is not enough moisture in the soil for all of the berries and one of the most difficult things we have in strawberry growing is to get our plants far enough apart and if the people in Wisconsin have an inexpensive method of doing this, I certainly would be glad to carry it to New York.

Mr. G. J. Kellogg: What is the best plan to get rid of strawberry insects that are injurious? I speak now of the leaf roller, ground borer and anything else, can you spray?

Mr. Taylor: I know of no strawberry growers in New York state who find it profitable to spray each year. In exceptionally few cases spraying is resorted to for the blight of the strawberry leaf, but my observation is that it is not continued more than three or four years by those who make the attempt. They prefer to select a higher elevation with better air drainage or to change to some variety that is more blight resistant. In regard to the grubs that attack the root; the avoidance of sod ground is the only method followed. No spraying at the present time is carried on generally for the strawberry.

Mr. Kellogg: The slug that works on the leaf, and leaf roller.

Mr. Taylor: So far as I know, very little if anything is done in regard to those insects. We have never been troubled with them at the Geneva station in sufficient quantities to cause any necessity for spraying. Arsenical sprays must be used for leafeating insects.

The President: How much good can be done by what the gentleman spoke of, mowing and burning, would it not be better to turn under old beds?

Mr. Taylor. The question of whether the old beds should be retained, or plowed up and a new bed started depends upon conditions. In may cases, if the beds are fairly healthy and not weedy, it may be advisable to hold the bed another season; but if the weeds are coming in thickly, if they are becoming troublesome and the plants unhealthy, it generally is much more satisfactory to turn the bed under and depend upon a new bed coming on to furnish the fruiting bed the coming year.

The President: What about the mowing and burning?

Mr. Taylor: Mowing and burning will sometimes be beneficial in destroying a large number of insects and fungus troubles, and yet Mr. E. L. Doty of Ilion, N. Y., who is growing at the present time eighty acres of strawberries, and who has grown strawberries continuously since 1867, informed me last summer that he has abandoned the method of mowing and burning.

THE NORTHWESTERN GREENING APPLE.

Its History; its place in commercial and in home orchards; is it a winter apple?

Shall we include it in a list of "Five best apples for the home orchard in Wisconsin?"

In a list of "Five best for commercial orchards?" In a list of "Three best?"

J. G. MELVILLE, CHIPPEWA FALLS.

I am not very well prepared to discuss the Northwestern Greening, but will tell you what I think of it and my experience with it in the Melville Settlement.

Eleven or twelve years ago I heard some members of this society speak well of the Northwestern Greening. A year or two later, in 1901 I planted 250 trees on the strength of what I heard society members say. These trees grew rapidly from the

start; even surpassing the Wolf River trees, which I planted at the same time. The second winter after I planted my Greenings the weather came very cold and dry. Nearly half of the older trees of Greenings that my neighbors had planted several years before died that winter or the next year. I think it was because they bore quite heavy the year before. My Greenings looked rather sickly after this severe winter but all lived; the Wolf Rivers lived also but the Ben Davis and Baldwins all died.

Since that winter my Greenings have made a fine growth and are now the largest apple trees on the farm for their age. They have a tendency to rot in the heart where the land is too rich.

I expect to make money off of my Greening trees as they have borne two good crops already; and I expect a bumper crop next year as I have mulched them heavy with straw manure. I will try and make them bear as much as possible and as fast as possible for we might have another cold and dry winter; so much dreaded by people here in the settlement.

As a dessert apple the Greening, I believe, is nearly a failure, but because of its fine appearance it sells well as a cooking apple and it is said to be good as a cooking apple. Of that however, I cannot speak from experience as I have never used them in my own family.

I was rather unlucky with my Greenings last season. We had a snow storm in October and it froze quite hard and I picked them off the trees while they were still frozen. The Greenings, Longfields, Gideons were badly rotted while the Wealthys, McIntosh Reds and Snows were not injured in the least.

The Greening, ordinarily will keep until, I believe, the first of March and is therefore a winter apple and will keep that long in a nice firm condition unless it has been much frosted before picking. After that it seems to go to pieces quickly.

I would not include it in the list of the five best apples for the home orchard for my own use. It is too poor in quality.

I would include it in the list of the five best apples for the commercial orchard. It is hard and solid and should ship well and sells well and I would say would be about third best apple for a commercial orchard.

I would hesitate to plant too heavily of the Greening as I do not consider it entirely hardy. An unfavorable winter might kill too many of the trees. In our section we are very much

126

WINTER MEETING.

in need of winter apples for commercial sale and as the situation stands with us, I know of no apple more worthy of third place than the Northwestern Greening.

L. H. PALMER, BARABOO.

The Northwestern Greening is giving good satisfaction in our locality. The apple is good size, a good bearer, sells well and will hang on the tree until cold weather. It keeps fairly well. There is some complaint about the apple rotting on the tree before picking time but when thoroughly sprayed there is little trouble along these lines.

I think for Sauk Co. the Northwestern Greening can be safely placed in list of five varieties for home use and in the list of both three and five for commercial purposes.

L. G. KELLOGG, RIPON.

At the beginning of this discussion we shall assume that the N. W. Greening apple is under indictment as not having sufficient qualifications to recommend it for a place in the home or commercial orchard. This question has been before a qualified jury, the apple growers of the state, for 25 years and it seems to be the verdict that the N. W. Greening is entitled to a place in the home and commercial orchard upon soils and locations that are adapted to apple growing. In judging fruit at county Fairs in widely separated sections of the state, I find the N. W. Greening in nearly every collection competing for honors and resulting in the closest competition.

I find it in nearly all of the events or entries of 5 and 10 varieties adapted to Wisconsin. The N. W. Greening may be an unusual apple for exhibition purposes but I feel that we must accept the verdict of the people and place it in the recommended list for the State of Wisconsin as one of the 5 best apples for the home and commercial orchard. If I were to select only three varieties for the home orchard I would substitute Newell in its stead as this variety is of better quality and will keep nearly or quite as well in ordinary cellar storage.

In a list of three varieties for commercial purposes I would include the N. W. Greening for its productiveness, uniform size, and attractive appearance in market.

Is the N. W. Greening a winter variety? I do not see how there can be any difference of opinion on this question that will even admit of any discussion. I would class any variety that would keep fairly well into the month of February or March in ordinary cellar storage as the N. W. Greening will do a strictly winter variety in this latitude.

H. C. MELCHER, OCONOWOC.

In assigning this subject to ten men in widely scattered sections of the State, there naturally will be very much repetition, also very much honest difference of opinion, for each one is expected to correctly represent his district.

We all know that the profitable apple must combine size, productiveness, hardiness and quality; if it is a red one, so much the better. Does the Northwestern Greening fill the bill, or are there lesser reasons why we should continue or discontinue planting it? As a rule the size is all right, especially the first few crops which are usually very uniform; the exception to the rule being older trees that have been neglected when you will often find on a single tree all the sizes known to the market.

In productiveness it is very erratic; it is never an early bearer, and a Wealthy tree planted the same time will earn several dollars for its owner before the Northwestern Greening gets started.

I was called upon last October to prescribe treatment for an orchard, some of the trees of which had been planted twelve years and so far had failed to produce a crop of fruit. The owner, a wealthy Chicago gentleman, was disgusted with it, and was ready, if I said so, to lay the axe to the root of every tree. On my way to the orchard I tried to forecast in my mind the conditions I was likely to find there, and such things as improper location, poor drainage, lack of pruning and other things suggested themselves. Imagine my surprise on reaching the orchard to find it located on a northeast slope, well drained, and a better pruned orchard than my own. An occasional scabby specimen of fruit revealed the fact that all of the larger trees The orchard was practically a were Northwestern Greenings. lawn, contained about two acres and was kept closely clipped and all clippings left on the ground. The trees were all mulched, and in appearance, all that could be desired. Not knowing what

128

WINTER MEETING.

else to do, I implored him to leave them still another year, to cultivate and dig around them, and if they still persisted in remaining unfruitful, to obey the mandate of the Scriptures and cut them down and cast them in the fire.

In southern Wisconsin it is considered entirely hardy. There has been practically no winter killing since the disastrous season of 1899, and that was the dry condition of the ground as much as the severe cold.

But how about its quality? And right here is where we part company. I am speaking from the view-point of the home orchardist, and the home orchardist is entitled to the very best that can be raised in his locality, and he can well afford to sacrifice quantity for quality. It will take some experimenting to find out what the varieties are but that should not deter us. I planted Northwestern Greening to get acquainted with it, and I must say that our acquaintance never ripened into friendship. We certainly have three better apples for the State at large, and in my orchard it is not one of the five best.

Has it a place in the commercial orchards of Wisconsin? We think so. There are sections of the State where it does extremely well, notably in the Sturgeon Bay district, and as long as there are so many people to whom an apple is an apple, regardless of quality, there will be a demand for them and the demand will be supplied.

Is it a winter apple? Grown anywhere in Wisconsin it is and that is its strong point, for we have comparatively few of the long keeping varieties, and if it came in the same season as the McMahon, it would have no place in Wisconsin horticulture.

At the request of Mr. Coe, the President called upon Dr. J. W. Coon, of the Wales Sanitarium, to talk on the Northwestern Greening apple.

Dr. Coon: Whenever I see a Northwestern Greening I always feel sort of a proprietary interest in it. It seems like an old friend always, because, as was stated by Mr. Coe, I have had something to do with the first propagating of that apple which has now become so prominent in our Horticultural meetings and in fruit societies of every kind. It was, I believe in 1873 that Mr. Hatch of Iola exhibited the apples of this seedling tree; it was

9-H. S.

then known as Hatch's seedling and Mr. E. W. Daniels bought the right to propagate it in the fall of 1873, I believe, and the scions were first brought in his nursery that fall and winter. I was then a young lad fifteen years old, and for about five or six years was making my home with E. W. Daniels, helping him in his nursery work, so that I think that I did the first grafting, perhaps all that was done for two or three years of this apple, which is now known as the Northwestern Greening. Mr. Daniels bought the right to propagate from this tree. There was also a little question between Mr. Hatch and Mr. Daniels, as to whether he had paid a fair profit. I believe he was to pay some royalty, but at any rate the tree was started at that time, in 1874, and has grown to what you all know as its great proportions at this time.

MR. A. J. PHILIPS.

"Is it a winter apple?" Yes. In sorting over a number of barrels last fall that I was selling, when I found a very nice one I put it in a barrel. That barrel is in the cellar yet with nearly all in it, and last Saturday, when I looked them over, I found only one apple that was too rotten to use out of a bushel and a half, after being kept in a common cellar. That is good evidence that it is a winter apple. I feel a great deal as Mr. Coon does, I have a little interest in that apple. Mr. Daniels said when they were pitching into him and the apple, that I was about the only friend he had and he made me a present of the first six trees I had, and I have those trees bearing yet. Now, Mr. Palmer says he puts it in the five best winter varieties for commercial purposes or for home use. I do both and I would put it in the three best for commercial purposes on account of its general appearance.

MR. M. S. KELLOGG.

I have listened with a great deal of interest to what has been said about the Northwestern Greening, and I regret that I shall be the first one to take a few knocks at it.

It is considered one of the leading varieties, but in our section of the state I would say, as far as production and profit go it is absolutely without merit, for the reason that on our black prairie loam, you get so little fruit, you wait so long for it, and when you
get it it is so poor, that you can grow more of other varieties that are practically as long keepers, that will take its place and will be more profitable for home orchards and commercial in our section than the Northwestern Greening. With us it needs a great deal of pruning and must be sprayed very thoroughly to get any fruit at all, and our experience has been in a series of years, that the fruit will decay on the tree before it matures, even with the application of the spray, unless you make four or five applications during the summer, the black spots will come on the sides of the apples from which cracks will radiate and in a few weeks' time the apple is decayed beyond any hope. It certainly is a winter apple grown on proper soil; with us it arrives at its maturity late in the fall and under our most favorable conditions we have kept them until Christmas, or a little later, but I have seen apples on our market shipped from the northern section of the state, grown on heavy soil, that have been in prime condition in the latter part of March and April. I would not include it in the list of five best varieties for the home orchard, but I would include it in the list of five varieties for the commercial orchard, but hardly in a commercial list of three for the southern section of the state. The tree itself is one of the most valuable varieties that we have in our nursery work, as the country throughout which it succeeds covers such a wide range, there is immense demand and ready sale for all the trees that can be propagated and while some of these things are to the detriment of the variety, it is one of our valuable apples.

MR. BINGHAM.

The standing of the Northwestern Greening apple, as I have observed it for the last fourteen years, is about as follows: I would not place it in a list for the home orchard, I would include it in a list of five best for the commercial orchard and I would give it about fifth place; I would not include it at all in a list of three best for Wisconsin. We find the Northwestern in the lake region and in Door county, especially, is very early about coming into bearing. It produces good crops annually, getting a light crop oft-times the odd year, or off year from the heavy crop. We find that it gets to be a good size; its keeping quality varies with different seasons. We often find it necessary to make three grades in packing in order to get as good results

as we would from other varieties with perhaps two grades. They are uneven in size, uneven in coloring, as to the quality, we all know. The tree is a good, hardy, vigorous and rapid grower; it needs thorough spraying and good orchard culture in order to make it do its best. We get more apples perhaps after the trees attain an age of twelve or fourteen years, more barrels per tree or per acre than we would of the Wealthy. It does not drop its fruit, but I think it will not stand up on the market with varieties that we have in Wisconsin today for yields, and the quality is such that I would not put it in a list of three best commercial and only include it in a list of five best commercial at the present time.

MR. W. H. MARSH.

The Northwestern Greening, as we have heard from different papers, makes a different showing in different places. In the Wausau orchard it made a very excellent showing. The only spot in the orchard where it did not come to what we might call absolute perfection was the north side of one tree where the limbs run out under a clump of plum trees which had no business there. Those were spotted, and I believe it as a fruit needs very open head work, needs air and sunshine. Some will do well without and others demand it. I believe the Northwestern is one that demands a free circulation of air and sunlight. It also needs thorough spraying. As we look over the fruit display here, we have no apple that shows up better, more rounded out than the Northwestern Greening. We do not need gloves to handle it and it does not need any polishing to make it show up It is uniform in shape, its color is all right, its properly. quality and flavor are fair. We cannot expect everything in one apple. We can use it in January, February, March, April, May, June or July and it does very good service in those months. The tree up with us in Langlade Co. is proving hardy, excepting in spots where there is hard pan underneath and there I do not believe any tree has a fair chance to make a fair showing. It develops a cancer which proved very troublesome in spots. It has a tendency to heavy foliage, so I would suggest heavy pruning. It is decidedly a winter apple. I think it is possibly one of the longest keeping apples in the cellar or cold

132

storage that we can produce at this time, and it is a recognized apple, as Michigan found at the Land Show this year.

As to commercial varieties, I would possibly leave it out of the list of three, but very few of us have commercial orchards with three varieties, our tendency is to get too many instead of two few. Certainly in a list of five I should place the Northwestern Greening, giving it fourth place there, and I would by all means recommend heartily in our section of the country the old Northwestern Greening, as it will surely prove worthy.

MR. G. J. KELLOGG.

I think the finest presentation of this variety was by the last speaker, backed up with the apples that he has picked this year of that variety. There is one thing certain about the Northwestern, you must spray, or you will get imperfect fruit. In the first place, you have got to be on light soil; as my boy says, in the Southern part of the state we have not much good apple soil. If I had gone into the hills back of the cemetery at Janesville, established my orchard. I might have been a millionaire by this time, but I went onto the prairie and on that prairie it is not a success.

Now, I consider the Northwestern as worthy a place in the five and three commercial varieties. It must be in a favorable location. It does not succeed on low, black, prairie soil, it needs white oak and clay ridges, especially in our farmer's orchard. Woodman in Rock county writes me that it is only fit for kindling wood. He is on prairie soil, six miles from my own home and the Wolf River and the Windsor and most of the varieties are succeeding in his orchard, but I do not think he ever sprays, that is why the Northwestern went back on him. J. W. Porter of Cambridge says that it is a success on his farm, while I have seen some on that very orchard, a heavy crop and hardly a perfect apple in the whole lot. I was there to get some to send to St. Louis, and there was not a perfect apple, while there were twenty-five trees loaded with Northwestern Greenings, they had not been sprayed. There is the secret of its success, you must spray and take care of it. In Robert Schultz's orchard near Lake Mills it was formerly a failure, but now his son is in the Short Course and they spray and it is a success. Last season he made a very fine report of

the variety. The farther north you get it the better it does, unless you get up toward the North Pole where it is not hardy enough. It is not as hardy as the Duchess, but it is worthy a place in every orchard. It is losing favor in Minnesota, they are going back on it a little there. At Spokane there were thirteen growers who exhibited the Northwestern Greening; in 1323 plates there were thirteen that were Northwestern Greenings, but they were no better than we have, in flavor we know they were not so good; they were as large, but I think we can beat them in quality, even if it is a poor quality. I will put it in the best five, and I would name the best five, I would say Duchess, McMahan, Wealthy, Fameuse and Northwestern, and the best three, Duchess, Wealthy and Northwestern Greening.

Mr. Cheney: I desire to know something about it for the benefit of the people of our county. We have in our county jack pine regions that have good soil for certain things; we have ridges of good clay loam soil, sand loam soil and we have ridges of heavy elay soil. Now, I would like to know two or three things about that; First, will this tree do equally well on all soils, (leaving out of account those places having hardpan near the surface).

Mr. Palmer: I have eleven Northwestern trees where there is a little sand on the top. They have borne twelve to thirteen years, they have borne heavy crops since they were seven years old on that soil and the trees are the largest of any trees I have in the orchard. There is a little sand on the top, it is mostly clay soil.

Mr. Bingham: From our observation of the trial orchard in Barron county I consider it exceedingly doubtful if the Northwestern Greening will ever be a success in Barron county. My experience with the Northwestern Greening is this, we shipped about 500 barrels of Northwestern Greenings and we found that we could sell McMahan, Wealthy, Snow, Newell and all other varieties of the orchard by the man's looking at those apples, but no commission firm in Chicago would tackle 500 barrels of Northwestern without first taking a sample and feeling of the market, and the fact that some of them have found out that they rot around the core has given it a black eye in the market.

Mr. Kellogg: A gentleman inquired in regard to different kinds of soils, I do not think he has been answered.

Mr. C. L. Richardson: I know of no place in Chippewa county where the Northwestern is succeeding on gravel or sandy soil; it is only on clay soil that at the present time the Northwestern Greening has succeeded. We do not have much hopes of making it succeed out of that territory.

The President: Mr. Melville is pretty well up toward the territory of Prof. Cheney and perhaps he can give the desired information.

Mr. Melville: I like the Northwestern Greening, I invariably take people into my orchard to show them the Northwestern Greening, but I do not believe in planting an apple that you cannot sell to the same man twice. I do not believe in planting an apple that I cannot recommend.

The President: I do not think we have actually touched on the hardiness of this apple; I would like to ask Mr. Melville in regard to the time when his trees were injured, what particular year was that.

Mr. Melville: It was about seven years ago. My trees were eight years old, it was the second year I planted them. It is pretty difficult to tell whether one has the right variety, and when people say they have the Northwestern Greening, they may not always have it.

Mr. M. S. Kellogg: I would like to ask Mr. Bingham what his observation has been as to the relative hardiness of the Northwestern Greening compared with the Duchess and Wealthy.

Mr. Bingham: I think the Duchess and Wealthy show off better as far as hardiness is concerned, than the Northwestern Greening.

Mr. M. S. Kellogg: Are they a quarter more hardy?

Mr. Bingham: Yes, I think I am safe in saying that they are. I think the Northwestern showed up in pretty bad shape, no good in fact, in the Barron orchard.

Mr. Palmer: The Northwestern is a tree that roots very deeply, and we have some other trees of that kind and such winters, I think, are likely to hurt those trees worse than they will others that do not. We noticed that same winter we spoke of the hickorys were hurt, they are a deep-rooting tree and I

think they are liable to be hurt such winters worse on that account.

Mr. Muhlenkamp: What kills our trees is the steady northwest wind for two or three weeks. I have watched the Northwestern Greening pretty closely and if we have another winter like the years 1894–95, there will be a lot of dead Northwestern Greenings in our state. At the same time I will plant it.

The President: We will now call on some of our friends from the other states. I think we have Mr. Wallace here, we will ask him to tell us about the Northwestern Greening in New York.

Mr. Wallace: It is not grown with us so much as the Rhode Island Greening; the Rhode Island Greening is one of the leading orchard varieties in New York state.

Mr. Pratt (Michigan): I have noticed since I have been here that you have a good many varieties that we do not have in Michigan. I am not acquainted with very many of yours, only two that you commonly grow and those are the Duchess of Oldenberg and Wealthy. I have also noticed this morning in your discussion of the Northwestern Greening that it is adapted to some localities, and some it is not. I believe that horticulture is becoming more of a science every day; that we have to learn what is adapted to one locality and what variety is adapted to another. We are learning that slowly in Michigan, and especially in the southern part.

Mr. Melcher: I had the pleasure of visiting the Michigan exhibit at the Land Show; it may have come from the northern section of the state, I do not remember the county, but they had as many boxes of Northwestern Greening and Wolf River as any other, and they seemed to be proud of it.

Mr. Cady: Mr. Kellogg has spoken of the Northwestern in Minnesota; I think it is losing favor quite rapidly, but it is with them about the same as with you here, the fellow that has the right sort of land and right sort of location for it is getting a good crop and likes it, the fellow that has the wrong soil objects to it; Wisconsin and Minnesota are both large states and there are probably locations that are not fit for the Northwestern. Perhaps it is better in making up a list, to make a list for different sections of the state, varieties adapted to that section, better than to give five or three varieties for the whole state. A few years ago we put a barrel of the Northwestern Greening

136

into the cellar and kept them until some time between the 1st and 10th of June, and they came out in good shape.

The President: I will call attention to the fact that the Northwestern Greening sells on its appearance rather than reputation. I think we rank red apples too highly; the Northwestern Greening will sell on sight better than any red, so will the White McMahan.

SPRAYING

ARSENATE OF LEAD.

The President: We will now be glad to hear from Mr. Tuck, who will give us a ten minute talk concerning arsenate of lead.

Mr. Tuck: I might add a word about the Greening apples. I have been at every exposition of apples pretty nearly at horticultural meetings from the New England show to the National show at Spokane, and I have not seen any better Greenings than right out here on those tables, all the way around. Some of the red apples at Spokane were a little bit larger and better looking, but even so, I do not believe they tasted much better.

What I did want to talk to you about this morning is arsenate of lead; I talked to you last summer on lime and sulphur. I am going on the supposition that you use arsenate of lead. Any farmer who is not spraying with arsenate of lead for codling moth or curculio is running desperate chances of soon losing his There are two kinds of arsenate of lead and only two, orchard. two definite chemical formulae. I have here a solution of sodium arsenate and here a solution of lead acetate. I will precipitate these to what is known as a concentrated solution. In so doing I am able to press the water out of my solution easily and give you a high percentage of arsenic oxide, but I want to show you that is not the proper way to make arsenate of lead. (The speaker here illustrated methods of mixing.) On examination you will see that is exceedingly coarse in structure, in that way it loses its spreading power, it will not spread over the leaves. When a man goes around and guarantees you high percentage oxide arsenate of lead, he is either giving you an acid arsenate of lead, or he is giving you a solution more concentrated which lessens its covering qualities. There are only two kinds of

arsenate of lead, there is the acid kind and the neutral; the difference is that one contains an acid atom in its molecule and it will surely break up if it is not combined or neutralized by the lead, it also contains a lower percentage of lead. The neutral kind is absolutely neutralized by twice as much lead present, so that there can be no breaking of the molecule whatsoever and there is no danger of injury to your trees after it falls onto the ground. That has been the strongest point that has ever been put out in the states of Washington and Oregon where the alkalinity of the soil has the tendency to break up any chemical of any kind. The proper arsenate of lead for a man to buy is that which guarantees you 121/2 per cent arsenate oxide. A man that guarantees you higher that 121% per cent arsenate oxide in a test must be doing one of two things, either he is giving you an acid arsenate that will burn your foliage and injure your trees in time or he is giving you an arsenate which has made the concentrate solution and you are not getting full value, it is not the properly made stuff. In time that will get down in your settling tank and pack hard, and the next morning, of if you let it stand over Sunday, you will have hard work with your agitator in the tank. The other will settle in time, but it will never settle hard, the slightest agitation will throw it immediately into solution in your barrel. This has been a matter of experiment for years. In fact, I am given to understand that arsenate of lead made in this way, containing 121/2 per cent arsenic was used on the Wausau orchard las year and everybody has heard of the wonderful results there, less than one per cent wormy fruit. The whole thing is, if you are going to spray, go out and buy the best materials, if you buy arsenate of lead, buy from a reputable firm, no matter if it does cost a half a cent more, because what is \$5.00 a year to a man that is getting \$600 an acre for his fruit?

Mr. Foley: Is there any one who can tell how often this arsenate of lead was used in the Wausau orchard, how many applications this year?

The Secretary: Three applications this year. In regard to arsenate of lead in the Wausau orchard, we have used a new brand each year. We used Disparine the first year, Swift's the next, Graselli's the next year, Sherwin-Williams this year and next year we will use Vreelands. We are going to be impartial, and I want to say that after studying the matter closely, I can-

not see any difference between one compound and the other in regard to its effects on the codling moth in the Wausau orchard; one has been as efficient as the other and none of them has ever injured the foliage as far as I can see. It is fair to say that the material used has always been contributed by the manufacturers, for which of course we are duly thankful, we appreciate that compliment; they have contributed very generously indeed.

In regard to the quantities used, I have never used as much as the manufacturers recommend, or as much as is commonly recommended in bulletins. The amount that we have used is about two pounds to 50 gallons, sometimes two and a half pounds, and we never have any wormy apples.

Mr. Crawford: Is Paris green used very much for spraying?

The Secretary: It is not used so much now as arsenate of lead. We have never had any check in the Wausau orchard; by that you will understand, we have not reserved any trees that were not sprayed, so it is barely possible that there would not have been any codling moth, any wormy apples anyway, but we have never had any there. I doubt if there was one per cent of wormy apples in the Wausau orchard this year, and the effects with spraying with Bordeaux have been very marked indeed, the crop is practically free from scab.

Mr. M. S. Kellogg: Are you sure you catch the curculio with the arsenate of lead?

The Secretary: I cannot say positively, but I think we have reduced the injury.

Mr. Kellogg: In my opinion it is practically impossible to eliminate the curculio with the poison, although I may be mistaken.

The President: I would like to say that after two years experience I am well satisfied that spraying with either Paris green or Arsenate of lead reduces the number of curculio and gougers very materially.

Mr. Palmer: I have sprayed this year and last year on the Duchess trees where the curculio work the worst, putting the poison on before the leaves start, and I think it has had a pretty good effect, at least I did not have any curculio.

Mr. Tuck: Mr. Quaintance of the U. S. Bureau of Entomology has recently written a bulletin on Deciduous Fruit insects wich will answer all those questions. He states that arsenate of lead is an absolute control for the curculio and gives

the evidence from the farm where he made his experiments, and also codling moth.

The Secretary: Should we mix the arsenate with the milk lime?

Mr. Tuck: Yes.

The Secretary: Is it not sufficient to pour it into the Bordeaux?

Mr. Tuck: You can put it into the Bordeaux afterwards, only, if you put it into your lime before putting it into the Bordeaux mixture, your arsenate of lead will remain longer in suspension.

A Member: Can you give us some recommendations in regard to Bordeaux mixture?

Mr. Tuck: For a 4-4-50 Bordeaux mixture, the first recommendation I can give you is to slake the lime carefully, that is an important point, do not brown your lime, get it carefully slaked, then dilute it to 25 gallons, dissolve your blue stone and dilute it to 25 gallons, then pour the two solutions together, pour the solutions simultaneously together.

Mr. Bryant: May I say a word in regard to the application of arsenate of lead for the plum curculio? Our Illinois entomologist tells us that the plum curculio early in the season, before the apples are of any size, feeds upon the leaves, that the effect of the application then is to poison them when they feed upon the leaves, not by spraying the fruit.

Mr. Tuck: The first spray of arsenate of lead is the most effective spray, most important, just before the blossoms fall, just before the cup of the calyx closes, to get some of the poison into the cups of the calyx will do away with probably 95 per cent of wormy fruit.

LIME SULPHUR AS A SUMMER SPRAY.

PROF. ERRET WALLACE, Cornell Univ.

Before beginning my paper I would like to say a few words concerning the reason why a certain Wealthy tree had been injured by the Bordeaux mixture while the adjoining trees had not.

There are three or four principal factors that are likely to control Bordeaux injury either to fruit to foliage, one is weather



(1)

(2)

(3)

Showing three stages of development of apple blossoms and fruit and best time to spray. No. 1. Right for 1st application, Bordeaux.

No. 2. Right for 2nd application, Bordeaux and arsenate of lead. No. 3. Right for 3rd application, Bordeaux and arsenate of lead.



conditions following the applications; another is the method of preparing the mixture and both of those factors seem to be eliminated from this case. There is another, the condition of the tree at the time it was sprayed, the condition of the foliage or the fruit, or the variety, either natural or artificial conditions. I was called on to diagnose a case in Western New York this summer of severe Bordeaux injury on foliage that occurred from early spraying, and I found that the leaves had been killed quite extensively and especially in patches over the leaves. I examined microscopically a large number of those killed areas on the leaves and found in every case that particular surface of the leaf had been previously attacked by the fungus and it had evidently destroyed the protective cuticle of the leaf, making it more susceptible to Bordeaux injury, and I found a difference in the varieties of trees: trees that were more susceptible to scab also had been more severely injured in this way. I do not know positively that the Wealthy is more susceptible to scab on the leaves than the other trees that were in question in this case, but it simply shows that there are a great many factors like that that might explain an apparently contradictory case of this kind.

The use of lime sulphur preparations as a substitute for bordeaux mixture in controlling fungous diseases of plants is a very live topic among fruit growers at the present time. Bordeaux mixture has in the past been recognized by practically all authorities as the leading fungicide, and though very efficient it has in many cases given considerable dissatisfaction on account of the injury to fruit and foliage resulting from its use. Bordeaux injury has been carefully studied by investigators, for several years past. All agree that many cases of injury may be due to carelessness in making or applying the mixture; yet frequently such injury is without doubt due to certain weather conditions following the application, and may occur after all known precautions have been taken. Those wishing to follow this phase of the subject further, are referred to Bulletin 287, N. Y. (Geneva) Agr. Exp. Sta., '07, and Illinois Bulletin 135. The authors of these bulletins agree that rain following within a few days after the application of bordeaux mixture is likely to induce injury. This fact places it largely beyond our control. We cannot afford to delay the application until after the rain for it is before rain and not after that the spray should be applied. I wish to emphasize this point very strongly. Do not wait for wet weather to come

and pass by for fear that the rain will wash off the spray. There could be no more certain way to defeat the object of spraying than this. Remember that each scab spot starts from a spore of the fungus which can germinate only in the presence of moisture. It is as impossible for these spores to germinate on a dry leaf or apple, as it is for a wheat seed to germinate in soil devoid of moisture. We find that these spores can germinate in four or five hours. Any infections thus started during a day or less of wet weather, will continue to develop regardless of any spray that might be applied the day after the rain.

This being true it would be a decided advantage to know of some efficient spray that can be applied when it is most needed without danger of injury. Thus far there are strong indications that some form of lime sulphur preparation will in the near future satisfy this demand. We have in use at present several distinctly different kinds of lime sulphur preparations. First the home boiled solution prepared in dilute form for immediate application as used for scale. Second, the self-boiled mixture as prepared by Professor Scott, Bureau of P. I. as a summer spray for peach rot and other fungus diseases. Third, the commercial concentrated lime sulphur solutions, and fourth, the home boiled concentrated solution as prepared by Cordley of Oregon and Stewart of Pennsylvania. Aside from these some proprietary preparations such as Pratt's sulfocide are now on the market. Experiments up to the present time seem to indicate that each of the above mentioned preparations has fungicidal value. Just what form will prove best for summer spraying yet remains to be determined. The preparation and treatment for each disease must be worked out individually. For example, while self-boiled lime sulphur may be the best remedy for peach rot, the commercial or home boiled concentrated solution may prove to be most desirable for apple scab. There is also great variation in the concentration required for different diseases.

The experiments at Cornell during the past season were limited to the commercial solution. They were carried out on the farm of L. B. Frear near Ithaca, New York, under the general direction of Professor Whetzel of the Department of Plant Pathology. For the work on apple scab, the experimental plat consisted of a block of Rhode Island Greenings and it was so arranged that we had various combinations as to time and number of applications with both bordeaux and lime sulphur. We used the Niagara

142

Brand, heavy grade, i. e., containing the sediment, diluted 1–30. No comparison of this with the clear solution was made this year. Arsenate of lead was used with both bordeaux and lime sulphur three pounds to fifty gallons, and the application was very thoroughly made with a gasoline power sprayer using quite high pressure, 125–150 pounds. Since we were uncertain as to what the results would be, only a small number of trees were sprayed with the lime sulphur solution. The experiment was not therefore ideally laid out, but the results were so striking as to make them of value. The table summarizes the condition of the crop from plats variously treated.

Table Showing Comparative Results of Spraying During 1909 with Bordeaux and Lime Sulphur.

Treatment.	Sound fruit. per cent.	Russeted fruit, per cent.	Scabby fruit, per cent.	Wormy fruit, per cent.
Unsprayed	2.5	29.7	42.3	25.0
Sprayed Bordeaux with arsenate lead	$5.2 \\ 9.9$	$3.7 \\ 82.2$	$3.6 \\ 3.0$	1.5 3.3

Table Showing Comparative Value of the Different Times at Which the Applications Were Made in This Particular Experiment, 1909.

Treatment.	Sound fruit, per cent.	Russeted fruit, per cent.	Scabby fruit, per cent.	Wormy fruit, per cent.
Spray Bordeaux only before blossoms open	6.6	33.4	41.1	14.2
sulphur	. 60.7	5.7	5.7	1.9
deaux	8.5	77.4	4.5	6.6

The attack of scab was not as severe as sometimes occurs, owing to the dry season. Forty-two per cent, however, of the unsprayed fruit was more or less affected. This was reduced by Bordeaux 3-4-50 with arsenate of lead to 3 per cent and by lime sulphur diluted 1-30 with arsenate of lead to 3.6 per cent. In this case the application just after the petals fell was the all important one and controlled the scab almost as well as where more were given. It would not be safe, however, for growers to depend on a single application of the fungicide since the season being dry

144

was especially unfavorable to later infections. Ordinarily about three applications will probably be necessary to control apple scab in New York State. One before the blossoms open, another after the petals fall, and a third from ten days to two weeks later.

The table shows that eighty-two per cent of the apples sprayed with Bordeaux were russeted; and many quite severely. For this reason we had only 9.9 per cent of sound fruit in the plats thus treated, while on those sprayed with lime sulphur 52 per cent were free from any blemish whatever. The fruit was entirely free from any form of spray injury. The apples were much more perfect in form and color and possessed a waxy finish, giving the fruit a quality superior to that otherwise treated.

We do not wish it to be understood that this difference should be expected in every case. It has already been pointed out that Bordeaux injury may or may not occur, depending largely on weather conditions. If we can avoid the risk of its occurrence by the use of an equally efficient substitute we are certainly benefited by so doing. I am well aware that some growers claim that bordeaux injury can be entirely avoided if certain precautions are taken. Even if this were true it would not alter the nature of the case. The fact remains that a large percentage of the apple crop for 1909 of New York State was russeted to an extent that would render it unfit to be classed as No. I fruit in a first class market. The loss occurred and will occur each year while bordeaux mixture is universally used. If this loss can be avoided by the use of a substitute that gives as good results and requires less skill, we are certainly gaining one point.

The use of arsenate of lead with lime sulphur solutions to control the codling moth has been a much discussed and unsettled question. When mixed, a chemical reaction takes place and we are not, therefore, spraying arsenate of lead onto the trees, but a new arsenical compound formed as a result of the chemical change. It has been feared that this reaction would destroy the insecticidal value of the arsenate and that it would cause burning of the foliage. In our experiments there was no foliage injury whatever, and that its insecticidal value was not decreased is evident from the fact that the wormy fruit at picking time was reduced from 25to 3. 3per cent on the bordeaux and 1.3 per cent on the lime sulphur plats. It is possible that other arsenicals could be used as advantageously as arsenate of lead. Professor Stewart of Pennsylvania favors the use of white arsenic added as





Unsprayed.



Sprayed with Bordeaux and arsenate of lead.



Sprayed with lime, sulphur and arsenate of lead. From photographs furnished by Prof. Wallace.



Power sprayers, State Fair Exhibit 1909.



arsenite of lime. He believes there is no advantage in using the more expensive arsenate of lead since it is broken up anyway. This is certainly worthy of trial, but so far as I know has not been tested in actual practice.

I have given, thus far only a brief account of our own experiments conducted in one orchard, and for a single season. This should not be considered alone but in connection with the work that has been done by others. It is a remarkable fact that the reports from those who have properly tested lime sulphur for apple scab, are almost universally favorable. Professor Cordley of Oregon, has experimented along this line for the past three seasons. Here are abstracts from two of his letters written to Professor Whetzel:

Feb. 18th, 1909. "Replying to your letter of Feb. 8th, will say, that we have used lime sulphur spray as a substitute for bordeaux in controlling apple scab for the past two seasons with most excellent results. Not only have we a considerably larger percentage of fruit free from scab by the use of lime sulphur, but there is also the advantage that no spray injury is produced as by the use of bordeaux."

In another letter dated Nov. 30th, '09, he states that the attack of scab during the summer of 1909 has been light; but that "the results, such as they are, verify the conclusions arrived at as the result of the previous two seasons' work, that is, the lime sulphur has given decidedly better results than bordeaux, and has produced no injury whatever in the fruit, even when used strong enough to injure the foliage considerably.

We also have reports of Professor Scott of Washington, D. C. In Circular 27, Bur. Pl. Ind., he reports that the self-boiled mixture prevented early infections of scab, but heavy rains soon washed it off and allowed some late infections to take place. The commercial solution adhered better and remained effective longer than the self-boiled. The use of arsenicals in the commercial lime sulphur, he states is an unsettled question. They are broken down by the sulfids and theoretically would be injurious to foliage.

In a recent letter concerning the work of the past summer, he writes "in our Virginia work we used commercial lime sulphur at the rate of 2 gallons to 50 gallons of water and 2 pounds of arsenate of lead, with only a very slight injury to the foliage. The same strength of mixture with Paris green burned the foliage

badly. The mixture at this strength controlled apple scab, but unfortunately scab was not very bad in any of the orchards treated. I am not sure, therefore, that the mixture would control the disease under conditions favorable to a severe outbreak. The self-boiled lime-sulphur prevented scab and leaf-spot just as well as the commercial preparation and the foliage sprayed with this mixture was in better condition throughout the season than that sprayed with the commercial brands. Here, again however, I am in doubt because the conditions were not favorable for a severe outbreak of scab and I would not consider results conclusive."

In addition to these we have favorable reports from Professor Brooks of New Hampshire, and Professor Battie of Washington. Quite a number of growers have used lime-sulphur as a summer spray during the past season and their reports are almost universally favorable. This, I think, summarizes briefly the most important evidence concerning this very important subject. We do not wish to urge any one to rush hastily into a new practice. We are not absolutely sure that the results will be as favorable every year as they have been in the past. They may vary with weather conditions. We do not wish to make positive recommendations. All we can do at present is to lay the facts before you and allow each individual to decide which risk he will choose to take. The whole problem is as yet in an experimental stage, but the indications are certainly favorable. There is much that we do not know, but give us time and a chance to work and we are going to find out.

The President: What about convenience in handling, and how does it compare in price with the Bordeaux?

Mr. Wallace: Is there any one here that can tell me about how much a gallon of Bordeaux mixture, as ordinarily prepared for spraying for apple scab would cost?

Mr. Bingham: About two-thirds of a cent a gallon.

Mr. Wallace: The commercial solution, that we use, and I believe the solutions that are put up by most of the companies are sold for about 20 cents a gallon, buying them in 10-gallon casks. Now, these are diluted 1-30, that would make the cost about twothirds of a cent per gallon of your spraying mixture as you put it on the tree, that is not including the arsenate of lead. I think we can make Bordeaux mixture a little cheaper than that in New York state.

Mr. Wallace: About two-thirds of a cent would be what this

would cost, diluted 1 to 30, and of course the trouble of making would cost, diluted 1 to 30, and of course the trouble of making it is nothing, you simply dilute it. Now, if any of you choose to go to the trouble of making a home-boiled concentrated solution you want to adopt some very uniform method for preparing the spray. I would advise any one to write to Pennsylvania State College for Bulletin 92, by Prof. Stewart on the preparation of lime-sulphur. He prescribes a method of preparing a home-boiled concentrated solution that will cheapen it as far as material is concerned, whether it would cheapen it as far as work is concerned, if you concluded to pay for the work, I cannot figure that out.

Mr. M. S. Kellogg: I would like to ask if the union of the arsenate of lead and these other arsenicals is as complete with the lime sulphur as with the Bordeaux mixture, is it as sympathetic?

Mr. Wallace: They seem to be a little more sympathetic because there is a chemical reaction takes place very rapidly when you mix the two together and I said in my paper, you are not putting arsenate of lead on your trees, but a new compound form of the sulphates, probably some that are unknown, but all we can say about it is that in this case and in all the cases which I have heard reported thus far, that we have no bad results from this chemical reaction, and the control of the codling moth has been good.

Mr. Kellogg: Do you get the same arsenical result, the same poisonous result?

Mr. Wallace: Well, we did this year, certainly.

Mr. Moore: I would like to ask, if you have a change in your chemical compound, in your arsenate, whether or not there is any danger from that becoming more soluble than the arsenate of lead and resulting finally in the arsenical poisoning of the tree.

Mr. Wallace: That is a danger that has been predicted by chemists, and from the theoretical standpoint there would be danger from that point. All we can say is, thus far we have not heard of any such a thing happening in actual practice.

Mr. Moore: Have you used them long enough to be certain?

Mr. Wallace: No, I say, in our own case we have only used it for the past season, but Prof. Cordley has used it for the past two or three seasons, but as I said, there is a great deal that we do not know about this and there is almost nothing that we are sure of as yet.

Mr. Moore: In using your concentrated solution of limesulphur, do you use just the clear solution, or do you often find a sediment?

Mr. Wallace: In our experiments we used the solution with the sediment in it, mixed them up and used the two together. The reason why we used that particular kind was that Mr. Freer with whom we were working had already purchased enough of it to do the spraying for the whole season. We do not know yet what the value of that sediment is as a fungicide. We are working along that line now and hope to have some information.

Mr. Moore: You cannot recommend it one way or the other?

Mr. Wallace: No. I do know absolutely that Prof. Cordley of Oregon and Prof. Scott of Washington have used other brands and brands that were only a clear solution, the Niagara put out both, a clear solution and one with a sediment in it, but I know Prof. Scott and Prof. Cordley have used other brands that were in a clear solution and got as good results as we did.

Mr. Tuck: There is nothing very obscure about it, as a "atter of fact, lime-sulphur in combining forms pure sulphites and sulphates; these sulphites are of no value as far as anybody can determine, and I believe Prof. Stewart determined they had no value as far as poisoning is concerned, they are not poisons from a chemical standpoint in any way. Prof. Stewart of Pennsylvania sprayed some trees with this so-called "mud," this sediment, and he stated last year it had no value, I believe, did he not?

Mr. Wallace: I think that is the conclusion that Prof. Parry has come to with reference to the value of the sediment as a scalicide. Now, of course no one knows in regard to the value as a fungicide; the principle is entirely different; in controlling scale you are controlling animal life; if you are controlling fungi, you are controlling plant life.

Mr. Tuck: You think there is some value as a fungicide?

Mr. Wallace: I do not know.

Mr. Moore: That is the point I wanted to bring out, whether the sediment had any value as a fungicide?

Mr. Wallace: I have some opinions on that line, but I would not like to express them until I am more certain than I am at present.

The President: Does not the lime-sulphur kill by contact?

Mr. Wallace: Yes, it kills by contact, it is not a poison.

The President: This other question as to comfort in handling, is it fully as disagreeable to handle as the ordinary Bordeaux mixture?

Mr. Wallace: I did not mind it at all. It is a little uncomfortable if you get some of it in your eyes, makes them smart, but you can see more clearly after they get over smarting.

NOTES ON THE LIME-SULPHUR MIXTURE.

By A. L. HATCH, Sturgeon Bay, Wis.

Perhaps the most salient feature of lime-sulphur as a summer spray will be the probability of its serving as a plant stimulus. If with its use foliage is made more vigorous instead of being depressed or absolutely injured as is so often the case in the use of Bordeaux mixture, its use will mark a great step in advance. If also it will of itself have an insecticide effect upon aphis, thrips and young scale lice it will have a marked advantage over Bordeaux mixture. Both of these are well within the known effects of sulphur and worthy of careful experiments.

In order to be acceptable to fruit growers the spray must be capable of carrying an insecticide so the operation will not need to be duplicated to prevent fungus and insect injury. While chemistry shows the effective part of lime-sulphur spray to be a delicate combination it is not probably much more so than that of Bordeaux mixture. There is probably some form of arsenate that will coalesce in such a way as to be fully efficient, even if arsenate of lead can not be used.

The new form of arsenate brought out by French scientists recently possesses some apparently great advantages over any other form now known and if it will combine with lime-sulphur without discord promises to be the acme of spraying mixtures. For this arsenate it is contended that by substituting iron sulphate for lead acetate in the making of arsenate it is expected to remedy the toxic effect of cumulative sprayings. If by the use of lime-sulphur we eliminate copper from our fungicide and by the use of iron sulphate eliminate the lead from the insecticide a further step is taken toward what is desired.

The general use of kerosene barrels in spraying has established the spraying barrel at 50 gal. This is what we may now regard as the liquid spray unit. Recently I made examination of several bulletins and found that the arsenical units for 50 gal. varied from one and 2-5 oz. to 7 2-10 oz. In other words the:e were five different quantities mentioned for the same purpose. Surely so wide a variation shows error somewhere. One professor in discussing lime-sulphur wash as a summer spray suggests that the stock solution be measured by Beaume's scale-28 degrees being a strength to require a dilution of 18 to 3. Here again we should meet with difficulties. It is not easy for common fruit growers to obtain hydrometers with Beaume's scale and it is not desirable that it should be used. The specific gravity can be better determined by weighing. Since, however, authorities differ in the amount of lime desirable to use in dissolving the sulphur it is evident the specific gravity of the resulting solution wash must vary with the amount of lime used. As the dominant force is sulphur and not lime it is evident that here too we need a definite sulphur unit. With the amount varying from 3-4 lb. to 1 1-2 lbs. of line for one of sulphur there can be little uniformity of results. Unless shown to be better otherwise equal weights of lime and sulphur and so made as to have a specific gravity of 1.25 would give a definite sulphur unit. Whoever establishes definite stray units will confer a benefit on horticulture.

HOW TO MAKE BORDEAUX MIXTURE.

M. W. RICHARDS.

You undoubtedly thought it queer when you glanced over your program and again saw there the subject of Bordeaux mixture. This subject, however, is like numerous other horticultural subjects, it pever grows old and we never know all about it. Formulae for Bordeaux Mixture and descriptions for making it have been published so often that the subject ought to be well understood; yet many inquiries are made regarding it every year and very much trouble results from an improperly made mixture.

In making Bordeaux Mixture the first thing to take into con-

150

sideration is the materials. It is made of Copper Sulphate commonly called blue-stone or blue vitrol, stone lime and water. To make a satisfactory mixture the best materials it is possible to obtain should be used. Copper Sulphate often contains small percentages of iron sulphate but rarely in excess, or in sufficient quantities to interfere with the efficiency of the Copper Sulphate. If first class sulphate is bought very little difficulty will be experienced as far as it is concerned. The lime, however, often offers serious difficulties. Lime contains more or less impurities. If the percentage of calcium oxide is high the lime is technically known as a "fat" lime; this on addition of water, slacks quickly and completely and will perform its office in the compounding of Bordeaux Mixture in a satisfactory manner. If on the other hand the lime contains a large percentage of magnesia, clay or sand, it is known as "poor" lime. Such limes slack slowly and incompletely and do not make satisfactory Bordeaux.

Air slaked lime should never be used as mixtures made with such lime are not only extremely injurious to foliage but are less adhesive and do not remain in suspension as long as mixtures made with fresh stone lime. The water used in preparing the mixture has very little to do with the efficiency of the Bordeaux. In spraying large commercial orchards large quantities of water are necessary and it is essential that the supply be ample and conveniently located.

For the commercial orchard, wholesale quantities will be needed and the local drug store should not always be depended upon to supply the demand. Buy your materials from somereliable dealer and in quantities large enough to take advantage of wholesale prices.

The cost of materials will depend largely on the amounts bought, and the grade.

The amounts needed will depend upon the size of the orchard, age of trees, number of times the trees are to be sprayed, and the season at which they are sprayed. On the average, one barrel (50 gal.) will cover twenty, 20 yr. old trees. At the present prices—8c per lb. for Copper Sulphate and 1c per lb. for lime, 50 gal. Bordeaux Mixture will cost about 36c or 1.8 cents per tree. A 10 acre orchard with 104 trees per acre will require 50 to 60 bbls. or from 200 to 250 lbs. Copper Sulphate and the same amount of lime for one spraying. These figures cannot be made absolute because they are based on estimates

and the amount of spray used will vary with the leaf development of the trees.

After the materials are at hand the next thing to consider is the proper utensils which are to be used in compounding the mixture. If only a small amount of spray material is to be made we will need three 50 gal. barrels, 2 large wooden pails, such as candy pails, and a few gunny bags. If the mixture is to be made on a large scale, as for a commercial orchard, larger and more pretentious utensils will be needed. The tanks should be elevated so that the materials will not have to be lifted but may flow by means of gravity. In making Bordeaux Mixture use only wooden or earthen utensils as the Copper Sulphate corrodes metals.

There are numerous formulae for the manufacture of Bordeaux Mixture and they will vary as the use to which the mixture is to be put. The formula generally used and the one we will use as an example is the 4–4–50 formula. It must be remembered, however, that the ingredients of Bordeaux Mixture unite in certain definite proportions and that the proportions are designated by the formulae which should always be followed closely.

In making small amounts of Bordeaux Mixture the quantities of materials called for in the formula are weighed out and the Copper Sulphate is dissolved in water. The lime is slaked and the two then diluted each to 25 gals. They are then poured simultaneously through a gunny bag into a barrel. The resulting mixture is Bordeaux.

If any quantity of mixture is to be made, however, stock solutions are resorted to. Certain definite amounts of materials are weighed out and made up to certain volumes. As 50 lbs. Copper Sulphate made up to 50 gal. water and 50 gal. lime also made up to 50 gal. of water. Then 1 gal. of the stock solution contains 1 lb. of the material. In dissolving, the 50 lbs. are tied in a gunny bag and suspended at the top of a barrel of water. As the Copper Sulphate is heavier than water it sinks to the bottom as it dissolves and the water around the bag is thus always in an unsaturated state. The lime is slaked in a slaking box as in the shallow box it is easier to handle than when in a barrel. The lime should have enough water on it to keep it from burning but not enough to "drown" it. If lime burns or "drowns" all of it does not slake and the stock

152

solution will be lumpy. In using these stock solutions for the 4-4-50 formula 4 gals. of each are taken and diluted to about 10 or 15 gal. This dilution is done because it has been found that the materials when mixed in a concentrated form make a poor mixture and the resulting Bordeaux does not remain in suspension well. The diluted Copper Sulphate and lime are then poured into a third vessel through a gunny bag sieve and the result is Bordeaux.

Another way of making up stock solutions is by using a saturated solution of copper sulphate. This solution is obtained by using enough of the sulphate in the gunny bag which is suspended in the stock barrel so that the solution will become saturated. It has been found that 1 gal. of a saturated solution of at the average temperature contains 3 lbs. of sulphate. The lime stock solution is made up by slaking no definite amount of lime and making up to no definite amount in the stock barrel. The mixture is made by taking 1 1-3 gal. of the sulphate solution diluting it and mixing it with an amount of diluted stock lime. The resulting mixture is then tested with potassium ferro-cyanide or as it is commonly called yellow prussiate of potash. When a few drops of the potassium ferro-cyanide is dropped on the mixture if an excess of copper is present a dark brown precipitate will be formed. More lime should be added if this brown precipitate results. When enough lime has been added to neutralize the effects of the copper no brown precipitate will result upon adding potassium ferro-cyanide. The advantages of this method of procedure are that it is less trouble to make the stock solutions and that they will keep indefinitely with no danger of their changing strength.

In conclusion I will mention a few precautions to be exercised in the preparation of Bordeaux Mixture.

1st. Use good materials.

2nd. Do not use air-slaked lime.

3rd. Do not mix in a concentrated form.

4th. Do not use metal utensils.

5th. Always test mixture for free copper.

6th. Always make according to some well established formula.

If these precautions are observed satisfactory Bordeaux is sure to be obtained.

154

A SUMMARY UPON ORCHARD SPRAYING EXTENSION.

J. G. MILWARD.

Wisconsin apple growers still find difficulty in applying spraying methods in their orchards, for the control of the codling moth and apple scab. To meet this difficulty, the Horticultural Department of the Experiment Station has for the past two years conducted spraying demonstrations in five counties in the state. Relative to this work, it is important to emphasize the following:

First, the work has been done under actual orchard conditions. Equipment has been selected and methods used such as would be adapted to commercial and farm orchards in Wisconsin.

Second, careful attention has been given to get an accurate estimate of the losses due to attacks of the codling moth and apple scab in unsprayed orchards. A comparison of these results has been made with results taken from sprayed trees in the same orchard and upon the same varieties.

Third, the above has been taken as a basis for recommending spraying as a profitable investment and insurance against attacks of the codling moth and apple scab.

The writer has made estimates of the damage done by the apple worm both upon single unsprayed trees and upon the collected fruit from unsprayed orchards. These tests have included largely such varieties as Longfield, Fameuse, McMahon, Wealthy, Northwestern Greening, Newell's Winter, McIntosh Red, and Wolf River. A crop of about forty barrels of Northwestern Greenings taken from twenty trees in Kewaunee county—unsprayed in 1909—showed about 95 per cent of apples infested with the apple worm. The percentage of unsound fruit in this orchard on Wolf River, Fameuse, Pewaukee ranged from 50 to 95 per cent. During 1908 and 1909, similar tests were made at Richland Center, Richland county; Baraboo, Sauk county; and Oshkosh, Winnebago county. The percentage of unsound fruit on unsprayed trees ranges from 40 to 90 per cent.

Orchard spraying has been done in the orchards where the above conditions were found. A block of trees from two to five acres has been sprayed and the percentage of unsound fruit calculated. From 60 barrels of Northwestern Greenings taken from



R. T. Smith Farm, Oshkosh, 1909. Wealthy apples, unsprayed, showing: 2¾ baskets sound apples; 3¾ baskets unsound.



Field Meeting Oshkosh, 1909. University Extension; Spraying.



sprayed trees at Baraboo in 1909, fifty-four barrels were sound and seven barrels unsound, making a percentage of unsound fruit of 11 per cent. From 145 barrels of McMahons harvested from sprayed trees on the farm of Henry Dworak at Casco, Kewaunee County, 135 barrels were estimated sound and ten barrels unsound, giving a percentage of unsound fruit of 7.2 per cent. At Oshkosh in 1909, on the farm of R. T. Smith the average precentage of unsound fruit on sprayed trees, all varieties, was 6.5 per cent. The average percentage of unsound fruit from unsprayed trees was 81.7 per cent.

The above figures represent only in part the data collected but will give an idea of average conditions. The beginner in orchard spraying must understand that orchard spraying means making a business-like investment and giving close attention to such details as 1, selection of desirable equipment and spray materials, and 2, timeing the applications in accordance with the development of the pests in the orchard.

The following estimate of complete equipment is given using 200 bearing trees as a basis. The reader is asked to notice that all material and equipment is purchased new, and that on the average farm there is considerable chance to economize upon the statement given. The average orchardist shows a tendency to neglect the work by selecting equipment and material unsuitable for the purpose and otherwise neglecting essential details.

Total Investment for Spraying 200 Bearing Trees.

Barrel pump	\$20	00
25 feet 1/2" hose, 5 to 7 ply	3	00
Bamboo extension rod	2	00
Vormorel nozzle and attachment	2	00
1 pump barrel	1	00
3 mixing barrels	3	00
2 stock solution barrels	1	00
2 mixing pails		20
Blue vitrol, 160 lbs	12	80
Lime, 200 lbs		80
Poison	10	00
– Total	\$55	80
Additional for 100 gallon tank	10	00

VEGETABLE GARDENING.

THE FARMER'S GARDEN.

A. J. PHILIPS, West Salem, Wis.

A Mr. I. W. Ingham of Bradford county, Pennsylvania, sent a paper on the above subject to be read at the summer meeting of this Society at La Crosse last summer, which varied so much from my idea of a Wisconsin farmer's garden that I am asked to reply to it. And in order to do so I will have to give some of his main points so my audience can understand this paper. First. He says the discoveries and improvements of each member tend to stimulate to greater effort by contact with each other. This I am free to admit is so. Second. He claims that a majority of the farmers have poor gardens. I will amend this by this change: that the minority have poor or no gardens. He said that the late Waldo F. Brown of Ohio said Third. that a majority of farmers fall below their privilege in not having a good garden. He answered that by saying that farmers had the privilege of going to summer resorts or to the seaside but they did not go because they had not the time or money to spare. I reply to this by saying that no class of people have more time and money to spend on vacations than the Wisconsin dairy farmers for from my station more farmers went to the Chicago, Omaha and Seattle expositions than did any other one class of men. Fourth. He says the field crops are the farmers' main dependence while his garden is not. I reply by saying that no place on the farm of the same size and run by the same expense affords the farmer and his family more of the necessaries and maintenance of his family and friends than does the garden, for when company comes unexpectedly, when threshers come, when corn shredders and silo fillers come, when carpenters or masons come to make improvements or repairs during the summer and fall, what is the first thing his good wife does? She may scold a little on the side because she has not had more time to prepare; then she sends some one for a few groceries; then to help out in supplying a bountiful meal, she gets a move on and sends the hired girl or hikes to the garden herself for the bulk of her supplies, and she usually gets it without first mowing down the weeds



A. D. Brown Farm, Baraboo, 1909. N. W. Greening from unsprayed trees showing: 23/4 crates unsound; 1/2 crate sound.



A. D. Brown Farm, Baraboo, 1909. N. W. Greening, sprayed, showing: 4 crates sound; ½ crate unsound.


as Mr. Ingham suggests, though I admit in some cases she may have been obliged early in the season to do some hoeing or plantinging herself in order to have a garden to fall back on. Fifth. He says according to his experience a family will eat nearly as much bread, butter and meat and drink as much tea and coffee and consume twice as much sugar when they have a good garden with plenty of pie plant and berries. And he further says a garden is a luxury, not a necessity. This is the story a farmer related to me when I was advising him to plant fruit trees. He said apples did not save anything on a farm. "Why," said I. And I will answer Mr. Ingham the same way. Fruit and vegetables, though they are composed largely of water, are appetizers; they aid in the digestion of heavier foods and preserve the stomach, that necessary organ, to carry a person beyond their three score and ten years well and healthy. Sixth. He says some claim a garden saves doctor bills. He answers by saying there is no proof of that as there is more sickness during the garden season than in winter, and says summer complaint originates in the garden. In this statement I think he is wholly mistaken. My own opinion supported by the opinion of a skilfull practicing physician here is that more summer complaint is caused by a lack of fruit and vegetables which aid digestion than by its use. The doctor informs me he dreads the winter cholera when the garden and berries are dormant among his patients more than he does the summer complaint when the garden is at its best. Seventh. Mr. Ingham says that farmers don't have good gardens which is prima facie evidence that good gardens don't pay in dollars and dimes, and he further says he has had long experience in gardening and farming and he can say deliberately that he can plow and tend 10 acres of corn at less expense than he can tend a half acre of garden. Well, at my age I had rather for pleasure or profit tend the garden. Mr. Ingham says if he lived near a village so he could sell his surplus from the garden the results might be different. But let me ask after a farmer's wife has supplied the average farmer's family through six months of summer with fruit and vegetables from half an acre garden how much would the surplus bring? I answer, not much. Eighth. He says that he once had a rich neighbor that hired an English gardener to make and attend to an half acre garden, that was all he did for six months at thirty dollors a month or \$190.00 for the summer. He said that garden was a luxury, and I think so. That kind of work might do in Pennsylvania but it would not work in Wisconsin. A good Wisconsin farm hand could plant and attend to a garden of that size by using a horse and a garden cultivator by working on it six days in every month, then have twenty days each month to raise other farm crops. That Englishman was either a poor man to hire or he had an awful good garden. Ninth. He says a farmer should have as good a garden as he can afford to. I agree with him here. He says fruit trees should not be planted in the garden. I agree in this, too. He said his father damaged his garden by planting cherry, peach and dwarf pear trees around the outside of it. Well, I think such trees with plum trees and a few top-grafted apples around the outside will pay in fruit and pleasure as much as any like amount of land located in any other place on the farm. Mr. Ingham does not mention flowers in the Farmer's Garden, but does say that a nice bed of asparagus on the side will furnish tender, delicious and healthful food in the early spring. Mr. Ingham's idea seems to be that the farmer's garden does not pay in dollars and dimes, but I think it does. I also think in Wisconsin the farmer and his family have something else in view besides the dollars and dimes; they desire some pleasure which is testified to by the finding in so many farmer's gardens, and in the grounds adjoining them, beautiful flowers. For example, the writer has attended funerals in a farming community remote from cities where the coffin of the departed parent or child was profusely covered with flowers that all came from farmer's gardens; there was no dollars and dimes, but it expressed more; it manifested sympathy, kindness, neighborly love and affection. I have in mind a farmer's garden, not an isolated case, but one similar to many I know, where some beautiful peonies are along the front, their deep green foliage is nice when they are not in bloom; then along the outside is or was a long row of dahlias which are beautiful as colder weather approaches; then at one side a long row of sweet peas supported by wire netting at a small cost; then from a half to a dozen rose bushes that when in bloom are so fragrant; then a nice pansy bed for the children to admire and pick and these flowers in addition to the early potatoes, sweet corn, lettuce, radishes, onions, string beans, tomatoes, cucumbers, early and late cabbage, parsnips, celery, a bed of carrots so useful and healthy in a boiled dinner, all work in beautiful to round out the farmer's garden, which,

WINTER MEETING.

though it may be a healthful luxury, is in my mind the most pleasurable and profitable cultivated spot on the farm.

Farmers, don't give up the garden.

Mr. G. J. Kellogg: I do not suppose there is a man here that would admit that he had not a good garden. A large proportion of these men are horticulturists, and I know the ladies here would have a good garden anyway. If there are any farmers here that have a poor garden, let me see your hands. I would have in the farmer's garden, on the sunnyside, a row of grapes clear across and I would not have a farmer's garden less than ten rods long, next I would have sweetbrier bushes, and if I could not fill out the whole row with one kind, I would fill out with two or three kinds, then I would have the currants, then strawberry bed, then the vegetables. There is no trouble in that way, with **the** long garden, it can be cultivated with horses, and if the wife takes hold of it and does the planning and planting, and the boys do the work, it is more often a success than if the old man goes at it.

Mr. Rasmussen: I agree with Mr. Kellogg and do not quite agree with Mr. Philips; the majority of farmers may have what they call a garden, but if they did not have any at all, they would be better off, because it is only there as an excuse, because they do not get any benefit from it, on a great many farms. I know almost every farmer in Winnebago county. Certainly the majority of farmers there have no gardens at all worth mentioning.

Mr. Coe: I would like to have Mr. Rasmussen live in Jefferson county; the farmers there have pretty good gardens. I would not think of living on a place without having a good garden; it is not a luxury, it is a necessity, and we ought to so consider it. It seems to me that there is no spot on the farm that is so profitable as the garden spot. Then too, we ought to grow flowers. Flowers have a refining influence upon the members of the family and a refining influence upon a community. For me, I want my own home to be such that when my children come to leave it, as they may, they may look back to that home as the dearest, sweetest spot on earth, and you cannot have that if you run it entirely on a dollars-and-dimes principle.

Mr. Morse: We have a good garden and I plant it myself and take care of it myself and do not grudge the work. I have done it before breakfast and after supper and we have had a good garden and raise many berries, but the garden part of it does not take any time at all.

The President: We raise a great many peas and people in town wonder why we do not sell them, for we have a surplus, but we can not spare the time to take them to market, but we can and do spare the time to look after our family. As to sweet corn we raise not only enough for the summer but raise enough to put away in the winter. We also pack away green beans for the winter. Our strawberries rotate among other crops and we always have a surplus. I have sometimes wondered if it would not pay farmers to co-operate, for whatever we undertake to raise we always have more than we need. About the only thing we sell in town is asparagus, but we always see that our own family is supplied first.

Mr. Howie: The farmers in my neighborhood as a rule have gardens, there are very few that have not, and the majority have good gardens, so that I believe it is an error to say that farmers do not have gardens.

Mr. G. J. Kellogg: Celery was spoken of. For the last two winters I have gathered my celery crop and put it in washtubs in about three inches of water, there was no dirt on it, and it has kept on growing all winter and becoming more and more tender. I just cover it with paper if the cellar is not dark and it is one of the best ways I know of to keep celery for family use.

Dr. Loope: I am a horticulturist, I am not a farmer; I see considerable of the farmers and I agree with my brother from Winnebago county, that the majority of farmers do not have very good gardens. There are some farmers that have excellent gardens and take care of them. I have a good garden, I cannot tell you what is raised in it, my wife could tell you that better than I can.

The President: I should like to call Mr. Philips' attention to one point, I did not notice that he brought it out; the main point of this paper was to prove that farmers could not afford to raise their own vegetables, that they had better get them from market gardeners. I do not think there are many in this audience that believe that. They all realize that the fresh vegetables and strawberries right from their own garden, lettuce, peas, sweet corn and all our other home grown vegetables have a quality that cannot be had by taking them out of the grocery store.

Mr. Philips: I think I said his talk did not apply to the farmers of Wisconsin, because nine-tenths of the farmers of Wisconsin do not live where they can go to a village and get vegetables, they have to depend on the garden.

WINTER MEETING.

CELERY.

H. C. CHRISTENSEN, Oshkosh, Wis.

The large and rapidly increasing demand for celery makes it well worth while for the trucker to give his attention to the growing of this excellent vegetable.

There are two points that especially recommend it to the market gardener—the large cash returns that may be obtained from a small area and its adaptability as a second crop. In our latitude, planting may be delayed as late as the first week in August and still a full crop be harvested; so that land that has been previously occupied with potatoes, strawberries, peas, spinach, carrots and other early vegetables, may be turned to good account by planting to celery. While a muck or deep black loam is preferable for its growth it is not essential and celery of a superior quality may be grown on heavier soils.

Methods of culture vary somewhat. Those which I shall give are those we employ in raising it at Oshkosh. The first thing to be considered is the raising of plants. For early celery, the seed is sown in flats in the hot-bed about the first of March. A soil composed of two-thirds good garden loam, one-sixth well decayed manure and one-sixth sharp sand is used for sowing the seed in. It is run through a half inch mesh sieve so as to thoroughly mix and pulverize the soil. Flats three inches deep are filled twothirds full. It is pressed firmly and smoothed off with a board. The seed is sown and covered to a depth of one-eighth of an inch with clean sand. The covering of sand lessens the liability to damping off. When the plants have made three or four leaves they are transplanted into flats an eighteen by twenty-two inch flat holding two hundred. Here they grow until ready to set out in the field. Proper attention being given to shading and ventilating in sunny weather. For later use, seed is sown in cold frames with glass or cloth covering and for still later use it is sown out of doors as early as possible in rows one foot apart in finely prepared soil. The seeder is regulated so as to sow the seed shallow, celery being slow to germinate it is sown thickly so as to secure a good stand. A little cabbage or cauliflower is sown with the celery to mark the rows so that they can be wheel hoed before the celery makes its appearance. They are kept weeded and

11-H. S.

wheel hoed the same as carrots or onions. They are cut back once or twice to induce a stocky growth, a sythe being used for this purpose.

As most of our celery is a second crop the soil is not plowed, except when following strawberries, but cultivated to a depth of five or six inches. A dressing of well rotted manure is applied in the row before cultivating. A twelve-tooth Planet, Jr. curtivator is used for finishing. This leaves the soil fine and mellow. In setting transplanted plants a trowel or the hand is used, but plants with a straight a-tap root may be more quickly set with a dibble. Blanching with boards is mostly followed. For this method, the plants are set in double rows, that is two rows are planted ten inches apart and a space of three feet between these and the next two is allowed for cultivating.

The plants are set six inches apart in the row. When earth is used for blanching, single rows five feet apart are used so that there may be plenty of soil for hilling.

When planting in hot or dry weather a mulch of marsh hay is placed on the plants. This is removed when the plants have become well established. After setting, the soil about the plants is kept well stirred with a harrow cultivator until the plants have attained considerable size. When a shovel plow is run through the rows hilling the celery slightly. From three to five weeks before the celery is to be marketed the blanching process is begun. For this, ten inch boards are used. Sixteen foot lengths being preferred. These are placed along the rows with a stake at each end to keep them from falling out, the top holding them on the inside. One thousand feet of lumber will blanch about twentytwo hundred stalks in double rows. After the boards are up, a mulch of stable litter is placed between the rows. This keeps the soil moist and does away with further cultivation. Late in the season some of the celery is hilled with earth. After the shovel plow has been run as closely as possible to the celery, without covering the leaves, the stalks are brought into an upright position by bringing the earth about the plant either by hand or with a steel rake. After the first handling, a shovel is used for further The back of a wooden rake is used to keep the leaves in hilling. an upright position while shoveling so as to protect the heart.

It will hardly pay one to attempt to raise celery to any extent without some means of watering in dry weather. An abundant supply of moisture being necessary for a crisp succulent growth.

We use a windmill, tank and piping, applying the water directly to the plants through a garden hose. This is a job the boys delight in doing.

In preparing for market, a sharp stiff knife is used for cutting. The plant is stripped down to the edible portion and the butt end neatly trimmed. It is then tied in one fourth dozen bunches and washed. As all our celery is disposed of in the local market no boxing is necessary.

When storing the celery, the outer stalks are stripped off and the longer leaves trimmed in somewhat. It is then packed closely in pits, which are made by making a frame of ten inch boards fifty inches wide and sixteen feet long with two cross pieces. This is placed on level ground and the dirt within removed to a depth of eight inches and banked about the outside. After the pit is filled, water is run to a depth of four or five inches to thoroughly moisten the roots and prevent wilting. A double covering of boards is then placed over the pits. This will keep out considerable frost and if an extra covering of coarse litter is given, celery may be safely kept here until well after Thanksgiving. In our section it is not considered safe in the ground after the twentieth of October. In cellar storage the plants are not packed so closely, some earth being placed about the roots when setting down.

As to varieties, we use mostly the self-blanching. For the general market we still prefer a good strain of White Plume to any of the various sorts of that variety. Golden Self Blanching is much superior in quality to White Plume but is of slower growth and more susceptible to blight and rust. It also requires a richer soil. For keeping qualities the green celeries excel. Evans Triumph Giant Pascal, Winter Queen, Noll's Magnificent are all good varieties. The green celeries require hilling with earth to blanch properly.

MY EXPERIENCE IN RAISING MUSK MELONS.

WM. NELSON, Oshkosh.

I have had about 14 years experience in raising musk-melons, raising about 6 acres each year. I have tried several varieties, but have dropped all except the Emerald Gem, Osage and Honey Dew, as I raise them only for home market.

I have only had one year experience with the Honey Dew, but I find it a very good yielder, also a good seller, owing to its large size and fine quality; and quality is what we want.

These three varieties each have a deep yellow flesh, fine grain and are very sweet. The Osage and Honey Dew are large sized melons, and we sell them by the dozen while the Emerald Gem is a small melon, which we sell by the basket.

The land upon which I raise melons is mostly sand. I plant the Emerald Gem on the lightest sand, which is very high land and faces the south, while the Osage and Honey Dew seem to do better on a lower and heavier sand.

I have not had good success with the Osage on the high light sand where I plant my Emerald Gem, because in a dry time or dry season they become tought and leathery, also somewhat onesided. I usually plant about 4 acres of the Emerald Gems, putting about half of them in the same ground where I raise radishes. This land upon which I raise my radishes, I fertilize very heavily with well rotted horse manure, spread broad-cast; then plow very deep, plowing clear to the beam, this being the secret of raising good radishes; because the radish requires a deep soil, and the deeper the soil is loosened the longer the radishes will be. I usually get about \$300.00 worth of radishes from this 2 acres.

Now the other 2 acres where I plant Emerald Gems, I fertilize in hills. I plow as you would ordinary ground, harrow it, then make deep furrows with the plow about 5 feet apart. Then I mark across these furrows with a light 3 foot marker, going across the ground where I already have my radishes sown. This furrowing with the plow is far ahead of the old fashioned way of making hills with a shovel, it being much quicker and better.

These furrows are the same width apart as the wheels on a lumber wagon, thus making it convenient in driving through with the fertilizers, as one wheel can run in each furrow.

Now in filling these hills, I have two men on the wagon, the man in front can throw the fertilizer, in the furrow, on each side of the wagon, while the man behind can fill the two furrows, in which the wheels run, putting a good fork-full in each hill.

Next using a spade-fork I mix the fertilizer with the sand; thus,—forming a hill, in the furrow, of course making sure to get the hill in line with the cross-mark; mix thoroughly and have at least 3 inches of clear sand on top of the hill to prevent the

WINTER MEETING.

young and tender plant from drying up, in a dry time, as it is apt to do, should you have the fertilizer too near the top.

I get these hills prepared as early in the spring as possible, then they are all ready to plant, as soon as the weather permits. I usually begin planting about the 15th of May, and have planted as late as the 15th of June. I always plant plenty of seeds, having from 8 to 10 plants in each hill; because the bugs are apt to destroy part of them, planting the seeds from 1 inch to $1\frac{1}{2}$ deep. As soon as I finish planting the ground that is in hills, I mark the ground where I have my radishes, the other way and plant that. The radishes make these melons about two weeks later than those in the hills, so that I do not rush them all onto the market at the same time.

Now the land where I plant my Osage and Honey Dew, I plow in narrow lands about 16 feet wide, so as to drain it well in a wet time; as this land is somewhat springy, and the Osage and Honey Dew seem to do much better on this kind of land, since they will not dry out and so grow much larger.

I also furrow this as I did for the Gems, putting 3 furrows on each land, mark it crossways and mix the hills in the same way, only I mark the rows 4 feet apart crossways instead of 3 feet as I did with the Emerald Gems. As soon as I finished planting, I begin cultivating crossways, to fill up the furrows between the hills. If we happen to have a hard rain that forms a crust before the seeds are up I have men rake over each hill with a common garden rake, this kills all the little weeds, just starting around the hills and gives the tender plant a better chance to come through.

As soon as the plants are through the ground, we must watch very carefully for the striped bugs and little black fleas, also for the cut worms, for these are our worst enemies in raising melons. The striped bugs and little black fleas can be kept off the young plants by keeping them well dusted with land plaster and ashes, but I have found no remedy for the cut worm.

As soon as the danger from bugs is over, we thin out the weaker plants and the last time we hoe thin down to two_or three plants in each hill.

Of course we all know the more we cultivate the faster and more thrifty the plant grows and it also prevents the soil from drying out. I always cultivate my melons as long as it is pos-

sible to get through the vines, the last two or three times 1 have them turned ahead of the cultivator.

Now being through cultivating, we can begin to look for the ripe melons. The Emerald Gem ripens first, and we pack in baskets and sell as peaches are sold.

When we first began packing in this way, we used common market baskets, putting 16 melons in each basket and selling them to the stores for 40c to 50c per basket, but we discovered that these baskets were too large for the dealer to sell to private families by the basket, so we now order baskets from a factory to be made half the size of a market basket. This basket holds 8 melons instead of 16 and we get the same price for the 8 melons in the small basket that we did for the 16 melons in the market basket.

The Osage and Honey Dew I sell by the dozen, usually sorting them into 3 grades, according to their size and quality, ranging in price from 60 cents to \$1.50 per dozen.

My melons usually bring me about \$200.00 per acre.

THE TOMATO.

N. A. RASMUSSEN, Oshkosh.

I am pleased to have the honor of addressing you this afternoon in behalf of the much neglected fruit, the tomato. We have heard discussions of all kinds on apples and berries, and, in fact, almost every kind of fruit grown in our climate, but not one word has been said about the most wonderful fruit of all, the Tomato.

Why do I call it the most wonderful fruit of all? Because it can be grown in more climates, on more kinds of soil, in a shorter period of time, on a smaller space of ground, bring larger returns for what has been given and, after it has been grown, be put to more uses than any other fruit grown.

The tomato is one of the few garden vegetables of American origin holding high rank as a commercial crop which has come into general cultivation within the last century. This plant, because of its relation to the night shade family, was for a long time held in disrepute by gardeners and people generally. For

at least a century after the tomato was familiar to botanists and gardeners it was very sparingly cultivated, and when grown at all, was used chieny as an ornamental plant. Its cultivation was, therefore, markedly delayed, and it was not until after the strong prejudice that the tomato was poisonous was broken down, that its use became general. 'The cultivation of the tomato in England and the United States came much later than it did in the countries bordering the Mediterranean. Climatic conditions undoubtedly had much to do with this. Because of the warm climate and otherwise favorable conditions existing in the Mediterranean countries the tomato flourished there. In England, however, because of the comparatively short season and small amount of heat during the growing period, the cultivation of this plant gained slowly. Even now the cultivation of the tomato in Great Britain is chiefly confined to house and protected walls. In the United States, after the plant was once introduced and its poisonous effects were discredited, its cultivation grew rapidly, and now we find it among the most generally cultivated of our garden vegetables. As before stated, the tomato is of American origin. The exact location from which the plants first carried to Europe were secured is not definitely known, but historical evidence indicates that these plants were taken from Peru.

Whether they came from Peru or from China, they are here in Wisconsin and are here to stay. They are very extensively used by all classes of people and for the two reasons following, they may be rightly named "Poor man's fruit". First, they may be bought very cheap in comparison with other fruit; second, if a man has a piece of land 1 ft. square, he may grow them. One square foot of land is large enough for the root and the top may be tied to a stake or a fence or it may be trained to the side of a house where it will be ornamental as well as useful. Three plants handled in this way will supply a family with plenty of choice fruit for the table. As poor men are very numerous in Wisconsin, especially among the horticulturists, let us, poor men, continue to raise and improve this fruit. I may as well add right here that when President Taft's committee gets around investigating the cause of the high prices of food stuffs they surely will find no fault with tomatoes at 50c per bushel, which at this price brings good profit to the grower.

Let us hope in the 25 years to come they will be improved

as much as they have been abused in the 25 years past. You all know that today you can not buy seed from as good a strain of tomatoes as you could 25 years ago. What can be done? Go to your field in fruiting season, mark a few of the very choicest plants and from these plants save the best earliest fruit for seed for the following year; thereby your fruit is improved remarkably. This has been proven by the tomato known in our locality as the "Buckstaff." This tomato was originated by C. D. Buckstaff, Oshkosh, 5 years ago by crossing the Beauty tomato with some other unknown variety, and it has been carefully improved by Mr. Buckstaff and the gardeners at Oshkosh. Although the Buckstaff seed has never been placed on the market, I think today it is far superior to any early tomato grown.

Now we take these seeds we have so carefully selected, sow them for early fruit in hot beds about March 10; when the plants have formed their second leaves we transplant about 2 inches apart each way and again when 3 inches high, this time in cold frames 4 inches apart each way, always keeping the soil well stirred and free from weeds, give plenty of fresh air and, in fact, when the weather will allow, we remove the sash entirely. By the last days of May, these plants are about 12 inches high, have a strong thick stem, are well branched and full of blossoms. A great many of the plants have small green tomatoes on which, if properly handled, we should lose very few.

Now remove these large plants to the field without injury. We take a large heavy knife and cut between the rows of plants both ways, through the dirt and about 1 inch into the manure. In this way, the plants having been well watered the previous evening, a solid mass of dirt and also a little manure will stay on the roots of each plant. They are then lifted, placed on a stone boat, and taken with a horse to the field, which has been previously prepared.

Although they will grow on almost any kind of soil, they prefer a light clay with a gravel subsoil with just enough slope to take away all surface water as they do not want wet feet.

A light sod plowed the previous fall, well disked, harrowed and crushed until in the best possible condition makes an excellent home for the plants. We now mark in rows 4x5 feet more or less, according to the richness of the soil. One man will dig the holes about 8 inches deep, another follows, carefully placing the plants in the holes, while a third man draws the loose dirt around the plant. At the same time one man with a boy to help him is working at the hot beds, another boy leads the horse to and from the field. Two stoneboats are used. With this erew an acre of tomatoes can easily be set in a day. While plants started 3 weeks later transplanted only once, 2 or 3 inches apart can be handled much faster, also produce an equal amount of fruit, they will not be as early and it is the early fruit that brings the large prices.

Cultivating begins immediately after planting and should continue until a horse can no longer pass through the rows without injuring the plants. At first a heavy cultivator is used but as the plants grow and fill the ground with roots, only a light fine tooth cultivator is employed.

Now as to picking. By July 15, tomatoes should be ripe and at a good market will bring 8 to 10c per pound. The price will, of course, drop gradually, but the yield will increase thus bringing in good profit continually.

After the tomatoes are picked, they are all carefully wiped, sorted in 3 grades, packed in 12 pound baskets, turned stem down, hardest in the bottom, and ripest on top. Later in the season, as the yield increases they are packed in bushel crates for the home market and in flat half bushel baskets for shipping.

For shipping they are picked a trifle greener and covered with red net. We pick the patches on alternate days, until frost comes when we gather everything ripe and green, and place in a room that can be heated. In this way we can ripen most of them and continue to sell ripe tomatoes for almost a month longer.

Last year we picked from 1 acre, which contained 2,200 plants, 49,500 pounds or 720 bushels an average of $22\frac{1}{2}$ pounds per plant. This amount of fruit brought \$421.60 or almost 1c per pound for the entire erop. At one time we counted on a single plant over 200 perfect tomatoes. The first ripe fruit was picked July 13, and sold at Oshkosh for 10c per pound by the basket gross weight.

In this way, you see, we get back money expended for baskets. It is also a much handier and neater way of selling and your fruit is not culled over by the purchaser.

For the home garden I prefer the single stem culture which is done by driving a stake 2 inches square and 5 feet long by each plant. To this the plant is tied and all side shoots pinched off allowing only the center leading stem to grow. In this way plants may be set 18x30 inches. Twelve plants well cared for in this way will supply a family with plenty of fruit for the table, also an abundance for pickling, canning and preserving and a liberal quantity to give to friends.

A Member: There is one question that bothers me a great deal; in the paper the tomato was called a fruit. I have heard it called a fruit and I have heard it called a vegetable.

Mr. Rasmussen: From everything that I could find in looking up the plant in all the books I could secure, I can bring you all the evidence you want that it is a fruit, also that it is a vegetable.

Mr. Irving Smith: I have been in several discussions on that very question and it is a very interesting discussion too. We have come to the conclusion that it is a fruit used as a vegetable, that is the only decision we can come to.

The Secretary: We have a botanist here, Prof. Cheney, no doubt he can enlighten us on that subject.

Prof. Cheney: Briefly, I should say it is simply a matter of usage. A fruit, botanically, is the ripened seed case of a plant, and in that sense a tomato is a fruit, but without question it is used as a vegetable. I should say it is a matter of usage. The term vegetable, in a broad sense, includes everything that grows out of the ground, but that it is not the way you would use it, of course, in gardening, the term is used as applying to carrots and potatoes and that sort of thing generally, and there it applies as well to the tomato.

A Member: I would like to ask the tomato grower whether he has tried putting his plants down, to lay them down instead of setting them upright.

Mr. Rasmussen: I have on occasions, but the roots formed along the stem, formed to grow a new plant before I had any material to grow fruit from.

A Member: So you would not recommend that?

Mr. Rasmussen: I would not recommend that kind of planting, it is growing too fast.

CONTRACTS.

C. L. RICHARDSON.

A contract as commonly accepted, is an agreement between two or more parties to do or to refrain from doing a certain thing. In order that it may be made, certain things—the elements of a contract—must exist. There must be the two parties to the agreement to do mutual things or exchange mutual promises; a thing or things to be contracted for; a consideration to support the contract; and the assent of the contracting parties.

It is a common expression in the law of contract that the minds of the parties must meet—meaning that they must have in mind and agree to the elements and all important particulars of the transaction, including the identity of the other party and of the thing contracted for, the consideration and its manner of payment, and the terms of the contract. Matters which are thus essential are said to be "of the essence of the contract," and are largely determined by the parties themselves—among the most common being the place of payment, and the effect of delay on the contract, in causing the delayer to pay damages, or by allowing the other party to abrogate the contract entirely.

The assent of the parties is another vital element, as it is the outward, visible sign that the minds of the parties have met on the terms. Assent is usually expressed by words or letters in answer to a spoken or written proposition, but any other means of communication will answer as well. Thus telegrams, telephone conversations, acts, gestures, and in rare cases, absolute silence under an obligation to speak, may signify assent and so bind the parties to perform the contract.

The essential acts in the formation of a contract are (1) An offer by one party, and (2) An acceptance by the other. Compliance with the offer must be with knowledge of it. Accidental compliance does not make a contract; the minds of the parties never met. Acceptance must be in precise compliance with the terms of the offer. In a leading Wisconsin case an offer to sell land, payment to be made in Connecticut, was accepted with the reservation that payment should be made in Wisconsin, and it was held not to be an acceptance in terms so as to bind the contract. In other words any material alteration in the terms of ac-

ceptance is treated as a counter-offer and breaks the original offer as would a refusal, so that it cannot afterwards be accepted unless renewed. An offer takes effect from the time it is presented to the mind of the offeree, and is considered as continuing until it is either accepted, revoked, rejected or expires by lapse of time. An offer must be accepted within a reasonable time, although what constitutes a reasonable time is not fixed by any rule of law but depends on the circumstances of each particular case. Nine or ten days' delay has been held unreasonable. Four days has bee; held too long a delay. The strict cases have allowed the offeree the day of the receipt of the offer to consider, and have held that an answer by the first mail of the following day was binding. In the absence of instructions to the contrary, the acceptance is presumed to be made in the same manner as the offer, but the parties can stipulate for a different manner of acceptance, as by tele gram, shipment of goods or otherwise.

The acceptance differs from the offer in some marked respects. Thus while the offer is not effective until it reaches the offeree, the acceptance is valid and binds the contract from the moment it is made, although not known to the offeror until later. The acceptance of a contract by mail is binding as soon as the letter. properly addressed and stamped is placed in the mail, although knowledge thereof may not reach the offeror for some time, or even although the letter never reaches its destination. A letter is "in the mail" when deposited in the post office or in a letter box. Whether an R. F. D. box is included is not yet adjudicated, but as the letter is not beyond control of the sender there would seem good reason to believe that a letter deposited in a rural letter box is not "in the mail." While acceptance is effective as soon as mailed, the revocation of an offer is not effective until it reaches the party intended. Thus A in Boston may make an offer to B in San Francisco. The offer may be sent on Monday, and received on Thursday. On Tuesday A may revoke the offer, but the letter will not reach B till Friday. So if B accept the offer Thursday or any time before the revocation reaches him the contract will be formed, though A's revocation has been three days on the road.

A contract requires a consideration to support it. By this is meant that gain or benefit to one party or that loss or detriment to the other which is the moving cause of the transaction. It may be money, a promise, or the doing or forbearing to do a certain

thing. A promise, or forbearance, or performance on one side may be the consideration for any of these on the other side. The contract to be binding must be mutual—in order that one party may be bound both must be bound.

Care should always be taken not to construe as an agreement letters which the parties intended only as preliminary neogtiations. Thus in a leading Wisconsin case the defendants offered, through a circular letter, salt at a low price in carload lots, whereupon plaintiffs telegraphed an acceptance for 2,000 barrels, and when delivery was refused, began action. The court was of the opinion that the letter offering salt was a circular, a mere preliminary advertisement intended to attract patronage, and that the telegram was not the acceptance of an offer to sell but an offer to buy, which must be accepted by the other party before a binding contract came into existence.

This case has a direct application to every nurseryman and fruitman in the state, as it establishes the rule that a circular, price list, or catalog is not an offer to sell but a preliminary advertisement intended to attract trade. Hence it follows that an order for nursery stock from a prospective customer for certain amounts, varieties, etc., is an offer to buy these goods only, and whether considered as an offer or a counter-offer abrogates all terms of the trade circular with which it may conflict. When taken in connection with the letter of acknowledgment, and retention of the purchase money it amounts to a contract of purchase and sale, subject it would seem to the implied condition subsequent that the nurseryman has the stock on hand when the time for delivery arrives. It then becomes the duty of the nurservman to fill the order exactly as ordered. If the order reads "do not substitute" or "in case you are out of (a certain variety) you may substitute (a certain other variety) only," it must be filled as ordered. In the absence of provisions to the contrary it would seem to be in the minds of the parties that the order should be filled as far as possible, and substitution allowed. If substitution were attempted in a "do not substitute order" the purchaser might at his option refuse the stock and demand back the purchase price and transportation charges.

It will avoid difficulty if the purchaser will give the date of shipment as this is often a material element, "of the essence of the contract." While it is reasonably clear that undue delay in ship-

ment is cause for avoiding the contract, there is no precise definition in law as to what constitutes undue and unreasonable delay. Three weeks has been held an unreasonable delay in shipping a carload of beans. Probably ten days or two weeks would be an unreasonable delay in forwarding nursery stock, depending on the stock, the time of year, the injury caused and the surrounding circumstances. In the absence of express terms making shipment by a certain day necessary, the purchaser would probably be deemed to waive the delay unless he notified the vendor that on failure of the stock to arrive he elected to rescind the contract, and demanding return of the purchase price. It will avoid misunderstanding, where time is essential if the order contains a direction that the stock shall be shipped by a certain day or else the money is to be returned to the purchaser. It would seem that such contracts for future delivery are made, if not otherwise specified upon the implied condition that the vendor shall actually have the stock when time for delivery arrives, and he is freed in case of destruction of his stock or in case he is previously sold out.

Often when the stock arrives it is found to be deficient in size, amount, quality, etc., failing to fulfill the representations or warranty under which it was sold. Under such conditions the purchaser has the right to inspect and examine the stock before accepting it. This right is not waived by payment of the express or freight charges, or even the entire price of the stock if this is necessary before the carrier will give possession thereof. If upon such examination, the stock fails to meet the express warranty (size, condition, quality and any other standard it was guaranteed to attain) under which it was sold, or the implied warranty that it is suitable to the purpose for which it was sold, the purchaser may within a reasonable time notify the vendor of these facts and refuse to take it, demanding repayment of the purchase price and freight. Or he may separate the good from the worthless stock and make payment for the good portion only, or in case none of the stock be worthless but merely defective or below grade, he may notify the vendor of such condition and refuse to pay full value therefor. In that case he is only liable for the fair market value, and if sued for the full purchase price he may set up a claim for damages to the amount of the difference between the market value of the property which was received and the market value of that contracted for, besides special damages

WINTER MEETING.

arising from the failure to perform, where such special injury was known or contemplated by the parties.

REPORT OF DELEGATE TO THE AMERICAN POMO-LOGICAL SOCIETY.

J. G. MILWARD.

Through the courtesy of the State Horticultural Society, the writer was privileged to represent Wisconsin as delegate to the American Pomological Society meeting held at St. Catherine's, Ont., Canada, Sept. 14 to 17, 1909. The past convention was the first time that the Society met outside the boundaries of the United States.

The meetings of the Pomological Society have always been of national importance because of the opportunities to come in touch with the widely separate horticultural interests of the country. Your delegate, while in attendance at the meeting, had in mind two questions which have always been discussed at our Wisconsin conventions, (1) "What estimate should be placed on the commercial Wisconsin apples as compared with the apples of other commercial apple-growing centers," and (2) "Is Wisconsin horticulture progressive?"

(1) In connection with the American Pomological meeting a joint fruit exhibit was held with the local society at St. Catherine's. Your delegate entered an exhibit of apples to be passed upon for merit and for the Wilder medal. The exhibit included the apples of Wisconsin origin—Northwestern Greening, Me-Mahon, Windsor Chief, Pewaukee, Wold River, Plum Cider, Milwaukee, Gem City and Newell. Professor Taylor of the Department at Washington passed upon the exhibit and awarded the Wisconsin State Horticultural Society the Wilder silver medal. Much favorable comment was passed by experts upon the apples exhibited, and the apples shown compared very favorable with any shown in the hall.

As a recommendation for future exhibits of this kind, your delegate would recommend that the exhibit be put up in commercial packed boxes, and that the display be made not only to include apples of Wisconsin origin, but also other varieties such

as the Wealthy, McIntosh Red, which are also grown commercially in Wisconsin.

(2) Is Wisconsin horticulture progressive? It gave your delegate much satisfaction to know that Wisconsin is keeping abreast of the times in adopting gradually the more progressive cultural The source of satisfaction should not be taken as restmethods. ing too strongly upon what has been accomplished in the past as upon the possibilities for future progress. It is encouraging to us that new developing horticultural fields are in a position to take up the more progressive methods and to profit by the mistakes of others, than some of the old districts where horticultural interests appear to be abating. Wisconsin horticulture should rise to the possibilities in the adoption of such methods as is making modern commercial fruit growing profitable. That is, including (1) improved methods of picking and marketing fruit, (2) intensive commercial spraying, (3) selection of commercial varieties, (4) adoption of intensive cultural methods.

In regard to the program at the convention, it might be well to say that the time was allotted to a discussion of a wide range of fruits, and hence not much time was spent upon fruits adapted to Wisconsin conditions. Probably two of the best subjects on the program were those of the sulphur sprays discussed by several experts, and the fruit marketing session which was handled very ably. Much of the time was spent in the considering of subjects of a somewhat technical nature such as the naming and classification of fruits.

Mr. D. E. Bingham of Sturgeon Bay was in attendance as a delegate also, and will report upon orchard conditions as he found them in the commercial orchards in the vicinity of St. Catherine's. Your delegate was treated very courteously by members of the local society at St. Catherine's, and also by officers of the American Pomological Society.



Portion of exhibit biennial meeting of American Pomological Society, St. Catherines, Ontario, 1909.



WINTER MEETING.

STUDENT JUDGING AND IDENTIFICATION CONTEST.

PROF. J. G. MOORE, Horticultural Dept., Univ. of Wis.

A new feature at the winter meeting of the Horticultural Society was the Student Judging and Identification Contest. For some little time there has been given in the Department of Horticulture, College of Agriculture, a course in pomology, which has as one of its objects the familiarizing of students with the common varieties of fruits grown in Wisconsin and other states. This work has been primarily confined to the apple.

For some little time there has been carried on in connection with the winter meeting of the Michigan State Horticultural Society, a Student Judging Contest. This contest seemed to create a great deal of interest in the lines of variety identification and judging, not only among the students in the College of Agriculture, but also among the fruit growers in attendance at the winter meeting. The writer suggested to the President and Secretary of the Society that the inauguration of a similar contest in Wisconsin might be expected to have similar results, and also increase the interest of the students in the Horticultural Society to which, in the past, comparatively few have had any definite relation.

The suggestion met with the hearty approval of the Executive Committee, and a sum of \$20.00 was set aside as prizes for such a contest. It was divided in four prizes of \$8.00, \$6.00, \$4.00 and \$2.00 each. The contest consisted of the identification of fifty specimens of apples taken from among some thirty or forty varieties suitable for use in Wisconsin, and commercial apple culture in other state. The second part of the contest consisted of the judging of four variety classes of six entries each; the student being required to award four prizes and give the reason for the awards. The work required over three hours, and the results obtained were highly satisfactory. The final awards were made by Mr. D. E. Bingham who was selected by the President as judge of the contest. The final grade of the student was determined by taking the sum of the final ranks in both the identification and judging contest, in which the student had been placed first, second, third, etc. The student having the lowest grand total was declared winner. The prizes were awarded as follows: Miss

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Vida French, first; Mr. Carl Muck, second; Mr. M. W. Richards, third, and Mr. W. Mueller and Mr. P. Lunde tied for fourth.

While this contest was only an experimient during the present year, the interest which it awakened among the students, members of the State Horticultural Society, and parties who read of the contest through the press, was so great that it would seem advisable that the contest be continued, and that the scope of the work covered be still further perfected in the future. One noticeable feature was the fact that those students who took part in the judging contest were more interested in the regular program than the average student who was not in the contest, being more regular in attendance, in fact, being present whenever the work at the University would permit.

The Horticultural Department feels very grateful to the Executive Committee of the Society for making possible this contest, and for its co-operation in trying to train the young people of Wisconsin along practical fruit growing lines.

WASHINGTON AND OREGON VS. WISCONSIN.

The President: We will now follow the suggestion of our Secretary and call on Mr. F. J. Toland of L Crosse to speak to us on the Western country.

Mr. Toland: I was invited to talk to you about Washington and Oregon and possibly can tell you some things that will be of interest. For a good many years I have been interested in fruit growing and the height of my ambition has been to own a good commercial orchard. With that object in view I have visited fruit growing sections in New Jersey, Virginia, Illinois, Michigan, Missouri, California, Oregon and Washington. I visited Spokane, Wash., the 2nd day of May, 1909, and left it on my return trip the 14th day of July. During that interval I visited nearly every advertised fruit proposition in Washington and northern Oregon. Quite a number I had visited in previous years and this was my fifth trip to the Pacific Coast. As I found conditions materially the same at all the advertised points, I will only mention some of those which are most prominently before the public, and as briefly as possible.

At Spokane I found numerous propositions that from a speculative standpoint were good, but I did not find anything in existence nor prospective that inclined me to believe that apples could be grown successfully or profitably in the vicinity of Spokane, Wash. The soil is varied, including pure unadulterated sand, coarse gravel with a sandy loam, I should say from 25 to 40 per cent gravel with a very liberal top-dressing of what we boys used to call clay, clay loam, and in some of the valleys. muck. I decided that the land would be good, some of it, for truck gardening and small fruits, but it would require considerable fertilizer and in loose soil the fertilizer would undoubtedly leach through and give no permanent benefits. As to the climate, the regular climate is subject to very severe and sudden changes, and the local conditions are such that on almost every quarter section that I came to I found land that was liable to frost, late and early, and land that would be caught by frost any old time during the growing season. The irrigation schemes that I saw consisted of wells with comparatively cheap pumping plants which were supposed to become the property of Eastern people when they purchased all the tract. I figured that they would prove very expensive, very uncertain, and it seemed that the water was too cold to secure the best results from irrigation. The commercial orchards exist more in the minds of the advertising companies than in reality. I saw a few orchards that the owners called commercial orchards. They were on the prairies and were not irrigated. Not one of those men that I met told me that he had ever made any large amount of money from raising apples at Spokane.

From Spokane I went to Pasco. If you are interested in Western land, keep your eye on Pasco, but be sure to keep your eye open on the real estate man at Pasco. There is nothing at Pasco very interesting to the fruit man. There is one farm about two miles from Pasco that is irrigated from the Columbia river, and I understand has been very profitable. I did not have any trouble to find a place to put money; they are looking for it, they meet you at the train and they follow you to the train when you are leaving if they have not got your money, in that case it is different. It may be a good thing, I think it will be after a while when they get water, but to secure water for irrigation or for the city even, they will have to raise it more

than 200 feet, and it seems to me that will be a pretty expensive proposition.

I suppose you have all heard of Atalia, as they call it out there. You have read those Arabian Nights stories, and sat up nights looking at the lovely pictures that are issued by the Atalia Land company. Long before I got to Atalia I saw pillars of what appeared to be smoke and I took it as a token that I was approaching the promised land, that in a short time I would be looking at the milk and honey trees. I was assured that a onelegged, one-armed, one-eyed man could make more money from five acres than an able-bodied farmer could in poverty-stricken Wisconsin on 160. I was disappointed in Atalia. I will say for the credit of the city that I never saw finer sage brush, and I have seen sage brush in nearly every state in which it grows. Most of it was fully five feet above the volcanic ash, it would all have been above had it not been for the gentle zephyrs that drifted the volcanic ash up against a portion of it until it struck through like asparagus points. The biggest trees I saw in Atalia were North Carolina poplars, about three inches in diameter. I was not the only disappointed pilgrim; two gentlemen from Ohio and one from Pennsylvania that had been taking absent treatment from the gentlemen that produced the literature that advertises Atalia, decided to go and not to buy. By the way, I discovered that those pillars of smoke that had raised my hopes were volcanic ash disturbed by the graders in leveling down the asparagus beds. I guess there is water there, but they did not have things in running order, which I am sorry to say was a big mistake. In numerous places where they are selling land they claim a man can make more money from five acres than a quarter section in the Northwest, and ten acres assures a man an independent fortune.

Leaving Atalia we soon reached a higher altitude, some very large fields; wheat farms, where they own or lease from 500 to 1,000 acres; each season one half of that is seeded, the other remains fallow. Between Pasco and Walla Walla I saw no crops outside of wheatfields. At Walla Walla I found conditions a little different, the people were not so given to the Munchausen style prevalent in the West and I found some really truthful men. The business men told me that they had a good, growing city, that they had good commercial orchards, two of them, one was located at Salem, the other up at Dayton, quite a little

distance from there. They stated many of the people were making money from small fruits and vegetables, not \$1,000 an acre. but netting from \$75 to \$100 an acre. They claimed that some of the land was very fertile, some was not; that a stranger should be very careful before purchasing. They thought they had nice weather, but they admitted that the summers were very, very hot, very, very dry, very, very, very dusty and quite windy and they did not lie. After two days I found that I could not find what I wanted in Walla Walla without assistance, so I called in a nice gentleman, real estate man; this gentleman informed me confidentially that he owned or had option upon everything that was worth looking at around Walla Walla. He took me out and showed me numerous farms he had sold a few months before to Eastern people at \$50 to \$60 an acre, which those same Eastern people have since refused from \$150 to \$200 an acre for. I might have believed him, but he quoted prices to me on some of the lands that I looked at that were 25 to 30 per cent more than the owners had asked. So at noon we went to town, I was captured by another real estate man, who also confidentially advised me that he alone owned and had options for all the territory adjacent to Walla. Walla, and that he had a little 'he best bargain in the state of Washington. He showed me a 30-acre proposition, ten acres of orchard, the orchard was scrubby, he said it was in its prime, eight years old. I afterwards learned it was thirteen years old and never had borne a crop of apples. The rest of the land was in rye and oats, the hay of the Western country. After inspecting it I said, "Now, look here, Mr. Blank, I am a stranger, I don't know much about land and conditions out here, now, honestly, between man and man, is that a fair sample of the land in this vicinity? Would you consider, if I was a poor man that that was going to be a good investment for me?" "Friend," said he, "there is not any better land on earth than that, why, that little farm will make you rich." Well, I believe every man to be truthful until I find out he is lying. I said, "What about this yellow stuff in that field?" "Oh, we had heavy rains and the sun came out hot, and the stuff was brown and scalded out." Every foot of it was underlaid with hardpan anywhere from six inches to I don't know how far down, I should judge not very far, the same as they have on the sandy hills of San Diego, they have to blast it out when they put in shade trees. I found tent caterpillars and

signs of scale in that orchard. I got back to Walla Walla and I looked around through the grocery stores at the apples. Of course you will understand this was in May, I did not expect very good apples. I bought five of them, one of them had scab and two of them were wormy,—but please understand, there are no insects that will injure fruit in Washington or Oregon.

From Walla Walla I went to North Yakima. At North Yakima I met several of my former students who were there and two of whom owned fruit farms. I visited them and asked their advice as to buying at the price at which the stuff was quoted to me and the stuff that was shown me and they said. "Don't." Yakima is a very pretty little city, the business part of it lies down in the flats on the Yakima river, sewerage is bad and they are subject to typhoid, which is not a very pleasant disease. The government scheme above Yakima is not more than just in the starting you might say. The water of the Yakima river, which is used for irrigation purposes, is, at the present time, or when I was there, no more than sufficient to furnish water for the people who already had rights. At Sunnyside and points below Yakima they were complaining of scarcity of water, and not only that but of the sewerage from Yakima which is polluting the river. I saw some very beautiful apples at Yakima, as pretty apples as I ever saw in my life, no prettier, though, than I had seen in Wisconsin, the only ones that approximated the apples in Wisconsin and Minnesota were the Spitzenbergs and Jonathans. One gentleman showed me a very nice dark apple, and told me "There is an apple that has not been in cold storage, ordinary cellar, what do you think of it?" I took my knife, peeled it. "What do you think of it, what do you think of that for a keeper?" I said, "I will admit it is a keeper, but let me ask, why do you keep it?" The climate of Yakima ranged from 124 in the shade to 22 in the shade, freezing one-and two-year old peaches and four-year old peaches which ranged three or four feet high. Do not understand they were all that way. They are keeping out frost by smudge pots. I found nothing but vegetable or truck gardens and small fruits and some cherries around South Yakima. South Yakima is one of the big schemes which is being advertised as a fruit proposition. It was originally a part of the Pacific Coast. There is more fertility in two pounds of the sand around Sparta than in ten acres of that stuff. You cannot sprout sandburs in it, but

WINTER MEETING.

they are selling it to professional people in the East. Between that land and Vancouver there is some pretty good land, I think, but it is certainly wooded, although it was logged off years ago and it will cost \$40 to \$50 an acre to clear it. You can buy it at wholesale from \$6 to \$12 an acre. There are large prune and cherry orchards, but people do not value them very highly, they are not profitable. I did not stop at Portland for the purpose of seeing the orchards that they have. Next I locked up the walnut proposition. I went over into Dam Creek country; I found numerous orchards which appeared to be one or two or three years old, the one-year cld had been injured by frost. I found no old trees. Farmers told me that they put those things down to sell the land.

Hood River is the most widely known proposition of the Western country. They have got the orchards, they have grown the apples and they have the brainiest lot of men engaged in business. The schemes there, however, are all real estate speculative propositions. So far as I was able to learn, I would advise any one to beware of them, and while the orchards are beautiful and profitable, a poor man could not buy more than an acre or two and the other propositions were unsafe. I visited everything that is within twenty five miles of Salem. My entire trip was something over 3,000 in an automobile through those countries. Salem is a beautiful valley, that is the valley of the Yakima river, reminds me very much of the countries east of the Blue Ridge mountains of Virginia, especially Albermarle country, There is one good orchard there, they claim that orchard made the reputation of Hood River. It has its reputation on account of prunes and cherries. The lands in that country varied in color from dark chocolate clay to very light clay and some sand and some muck. The old orchards all showed disease. In regard to the wondrous stories about large amounts to the acre, why, they do not get them. They make \$75 to \$100, that is what they told me down there. They raise corn, but they have to dry it in the prune dryers, because it is so wet in the fall. Of hay and timothy they can get one crop. There is one thing I would advise any one going out to remember, look out for the real estate men; do not believe the advertisement stuff that is put out by real estate people. They use the same pictures interchangeably, everybody is advertising Hood River, Wenatchee, North Yakima, by the same pictures, not one but a great many.

The climate east of the Cascade range is insufferable in summer, west of it in both Washington and Oregon is too rainy to suit me, very disagreeable in that respect. In conclusion I should say this, that there are opportunities there for a man who has money, so there are in Wisconsin. I found that the principal things according to my view were, first, intelligence in the selecting of a location and fruit; second, intelligence in taking care of it; third, intelligence in organizing. The others depend on the location and shipping facilities, and it was my honest opinion from my limited knowledge of the subject that any man that would use the same amount of brains, cultivate his land as carefully, select his land as carefully and select as good kinds of fruits he can make just as much money in Wisconsin from a limited capital as he can in Washington or Oregon.

W. H. Hanchett: You have already heard a speaker who had taken more time to investigate the matter from a business standpoint than I have. The impressions I got were right in line with the facts that he gave you from his investigations. It was my privilege to put in one day in the Hood River valley, driving out among the orchards. I also had the opportunity of calling on the Apple Growers' Union and consulting with one of the office force at Hood River and also interviewing a real estate man. In consulting with one of the office force of the Apple Growers' Union I asked him what the estimated apple crop was in the Hood River valley this year, and he told me it was an off year, that the crop was a minimum crop, that it probably would be about 100 carloads out of Hoed River valley this year. In interviewing the real estate man, or in having the real estate man interview me, I asked the amount of available orchard land in the valley. He said it was about 50,000 acres. I asked him what per cent was planted and he told me about 30,000 acres were planted. I asked him what per cent of that already planted was bearing and he told me that about 25 per cent was of the bearing age. In making a few figures I estimated that that would reduce the bearing age to about 7,000 or 8,000 acres, and in estimating the yield of the Apple Growers' Union that year to be about 100 carloads, it would reduce the average yield to about seven or eight bushels per acre. I think we might put this up for Wisconsin orchards as a minimum crop. A Wisconsin orchardist probably would not be able to conceive of such favorable circumstances as would reduce his yield from an

orchard, even though it was the off year, to seven or eight bushels an acre.

In driving out through the valley we drove miles without seeing an orchard with an apple in it. We were told that the harvest season was just commencing and that the apples were mostly off the trees. We found a few orchards where there was something of a crop of apples, one small orchard in particular I noticed was heavily loaded, every tree was propped, every branch of every tree was propped, and if they were getting the prices which they claimed they were getting, it would not be hard to figure up two or three thousand dollars per acre for the crop. We were given the impression that a large share of the crop had already been contracted for at \$3.35 per bushel box, and of course we could believe some of the stories the real estate men told us, if that were true. We were told that one man had been offered \$4,000 for a crop on one acre and a third, and another man with a 15-acre orchard had been offered \$2,500 per acre for his crop. There was one thing which was the cause of considerable surprise on my part in going through the valley and that was to notice the farm homes in this orchard district where we were to believe that dollars grew on the apple trees and all you had to do was to shake the trees and fill your pockets. The farm homes would not begin to compare with residences in Northern Wisconsin. We saw many farm homes that looked like a North Dakota field grain bin, with the door cut in one side and the window in another and a piece of canvas stretched over for a roof, and we were told people lived in them for several years. Of course the real estate agent would explain that that was because the climate was so mild. I have a few quotations from some of the trade journals in regard to what the Western apples really did bring on the market, and I find that there is quite a discrepancy between the quotations in the market journals and the prices quoted us in the Hood River valley. The Fruit Trade Journal of New York, January 1, 1910, savs, "The box apple situation remains unchanged; prices were firm, but the movement was very slow. Spitzenbergs had the call at prices ranging from \$3 to \$4.50 per box." Now, we were given to understand that the crop of Spitzenbergs in the Hood River valley had been sold at \$3.35 a box there. Here we have a quotation in the New York market at from \$3 to \$4.50, and Rome Beauty sold at \$2.20, Winesap at \$2.50 to \$3.00, Newton pippins

brought from 2.50 to \$3.00, while Ganos went at \$2.00 to \$2.50 per box. Now, when we take a freight charge of at least a dollar a box to get to the New York market, you will see the average price per box would probably not exceed the price which Mr. Marsh got for the apples from the Wausau orchard, from those quotations. A Chicago trade journal, Dec. 25, 1909, says, of the Chicago market: "Western box fruit is bringing \$1 to \$4 according to pack and quality, only the very best however sell around the top price mentioned, \$4.00." The price refers to Spitzenberg, which are practically all out of the market, from one to four dollars. Now, when we strawberry growers get a quotation saying that strawberries are selling from 50 to \$1.50, we expect the returns will show that a large part of them sold for 50 cents. I do not know but that might apply to Western box fruit, and if the majority of that stuff sold from \$1.00 to \$2.00 per bushel box, you can readily see with the large expense charged against it, that the grower got almost nothing for the The "Fruitman's Guide", January, 1910, says of the fruit. New York market, "There are a good many apples still to come forward from up state points and the stock is still held in the West largely in boxes, a great deal of this box stock will be coming forward right along. Some of the colorado apples in the market this week sold at auction at rather extraordinary figures, due, we believe, largely to the fact that oranges are so plentiful and more suitable to the holiday season. Gano sold at \$1.05 to \$1.45; some of the Ben Davis stock sold at \$1.35 per box and Red Sweet at \$1.00 per box. This fruit seems to be less active than was the case some weeks ago, though the condition of the stock was fair. There was a car of Washington apples sold here at auction on Monday and Spitzenberg sold at \$1.25 to \$2.25 per box." Take that sale at \$1.25 to \$2.25, it does not mean anywhere nearly the price that the Wausau apples were sold for. "These prices we believe show no special profit to the shipper and it is unlikely that the stock will be urged on this somewhat unwilling market." Now, you doubtless all have heard of the celebrated Dumas orchard that the real estate agents are always quoting. Now, the Fruit Trade Journal of Dec. 11, 1909, says, "In New York two cars of Newton pippins from J. L. Dumas sold for the lowest figures, \$1.20 per box." It adds that Western Winesaps brought from \$1.50 to \$2.30, \$2.60 and \$3.00. Now, take the \$1.00 charge from these and compare it with our

own Wisconsin apples at from \$3.00 to \$4.00 per barrel and then judge as to whether you want to go out there and pay from \$400 per acre for wild swamp land without any improvement to \$2,000 per acre for young orchards, and I do not think you will have any trouble in deciding where you wish to invest if you want to buy orchard lands.

I expected, when I started on the trip West, that I would become so enamored of the wonderful prospects out in that country that of course I would come back to Wisconsin, sell out just as quickly as I could and buy land out there, but when I got back to Wisconsin. Wisconsin never looked so good to me before. There was one thing that I noticed particularly going through that country, I went through some of the country where farmers planted orchards the same as farmers plant them in Wisconsin and then let them take care of themselves. Those orchards were certainly the worst looking specimens of orchards that you can find anywhere in any civilized country. The trees were mosscovered, the apples were moss-covered, and I do not think anybody would ever get so apple hungry as to be tempted to eat. them. Certainly a neglected Wisconsin orchard would never get into so bad a condition as a neglected orchard in Oregon or Washington. If care and culture would make so much difference in Wisconsin as it does in Oregon, we certainly ought to think that orchard prospects in Wisconsin were very bright.

QUESTIONS AND ANSWERS.

SMALL FRUITS.

Question No. 1. Has anyone a failure with Dunlap strawberries?

Mr. Bingham: In Door county they are planting largely of the Dunlap and Warfield, and while the Dunlap is a berry that we pick with the Warfield, and it is a fair berry as far as yield is concerned, it does not yield with the Warfield. I think the Dunlap, though it is a good berry to work in with the Warfield, it is not as good a yielder as a great many have claimed for it, not in our locality.

Mr. G. J. Kellogg: I agree with Mr. Bingham on that score.

Question No. 2. What is the one Black and one Red raspberry?

Mr. Bingham: The Older and Kansas are perhaps as good black raspberries as we have; the Older was perhaps a little better yielder, a little hardier than the other.

Mr. M. S. Kellogg: It depends a great deal on the locality, or local conditions, as to which is the better. In some localities you cannot grow anything but the Older, in certain sections you can grow certain varities. The Commonwealth does better with us than the Older, it gives us more bushels and more dollars on the same amount of land.

Question No. 3. Which is preferable, deep or shallow plowing for strawberries?

A Member: I should like to answer that by asking, "Which is the right road to heaven?"

Mr. Knight: I can tell you-by the way of Bayfield Peninsula.

The President: That being conclusively answered, we will take up the next one.

Question No. 4. Which is better, spring or fall plowing, for strawberries?

Mr. M. S. Kellogg: It depends altogether on your soil. Some soil is better plowed in the fall than in the spring.

The President: How shall we apply that?

Mr. M. S. Kellogg: Fall plowing for heavy soil.

Question No. 5. Can strawberries be cultivated too much? Mr. G. J. Kellogg: No, unless you go too deep. Mr. Richardson: You cancultivate too late.

Question No. 7. When and how do you prune blackberries? Mr. Hanchett: That is a hard question to answer, as it calls into consideration different conditions and varieties. With the Eldorado blackberry all the pruning we do is to go through and pinch back the growing shoots when they are two feet high, so as to make them throw out laterals, they do not load so heavily and the fruit is largely on the tips of the laterals. If you go through an Eldorado patch and prune the tips to any extent, you have pruned off your crop. With Briton pruning is more necessary. In the spring immediately after they come from winter protection, cut off perhaps one-third of the laterals. The Briton has the fault of loading so heavily that it cannot mature its crop, and I think it is advisable to prune for that reason.

Question No. 9. Would like to know the best method for handling strawberry plants, shipping, digging, cleaning, tying and packing?

Mr. Moyle: In regard to shipping strawberry plants, I use bushel baskets; the boys go into the fields, dig them up and jam them into the basket, bring them to the shed; there I have girls good, smart girls—to sort them, and by that means I do better than by sorting them or tying them in the field. My soil is very heavy, the dirt clings to the roots, we wash a great many of them at the tank before we ship them.

The President: What is the manner of packing them in the basket?

Mr. Moyle: Use market baskets, they are generally convenient, get a thousand into a basket, the most up-to-date method is using slatted crates.

The President: Some years ago I received some plants from Sparta packed in bushel baskets, the idea seemed to be to pack as many as possible into the basket. I think growers generally are getting a better idea of seeing that the roots are well packed together and kept from drying, while the tops have air. With proper packing the tops ought not to suffer by long shipment.

Mr. Moyle: I was forced to adopt this. At one time I was in charge of a nursery where we had sandy soil and the method was to dig the plants and tie them in the field, took a gang of fifteen to twenty of us in the field, working all the forenoon and by dinner time we took them into the house and those plants were not fit to go out of the packing shed when they were shipped, many of them. That was the method carried on all the time, and I made up my mind when I went into business for myself I would have something better. I would like to ask Mr. Pearson how he digs his plants?

Mr. Pearson: Dig them with a five-tined fork, put them in gunnysacks and carry them to the packing house that way.

Mr. M. S. Kellogg: The question was asked about digging plants with a potato digger. We have been for a great many years trying to find some way to reduce the cost of digging plants, and I will say we used both systems that have been spoken of by Mr. Moyle, bring in the plants after sorting, and sorting them in the field, the weather determining which method we should use. If it is a dry day, the plants are brought under cover; if it is a cloudy day, we often bunch them in the field. We can make twice the speed in the field as in the shed. We have used a potato digger, but it is not a success. We have also attempted to use a tree digger. The best digger we can get hold of is a good, husky man, with a five-tined fork.

Question No. 10. What are the best varieties of strawberries for Jackson county, on clay soils, for home use?

Mr. Hanchett: Senator Dunlap, Warfield and Dunlap, if you want more than one.

Mr. G. J. Kellogg: Add Brandywine and Glen Mary.

Question No. 15. What currants are most profitable to grow in Wisconsin?

Mr. M. S. Kellogg: Our most productive varieties are the Pomona and Wilder, to the exclusion of all the others. Those two take the lead, they bring the top prices on the markets and bring the top returns in the boxes, too.

A Member: How about the Red Cross?

Mr. Kellogg: They are not in it with the Wilder.

A Member: With us it keeps better than the Wilder, yields more and it looks better in the boxes. We have clay soil, heavy soil.

Question No. 17. Which would be the most productive and best market strawberries, two early, two medium and two late?

Mr. G. J. Kellogg: The two earliest that we have found the most satisfactory are Bederwood and Warfield. There are others that are about fifteen minutes earlier, but they do not bear anything. For medium, if you want a pistillate, there is nothing that exceeds the Splendid, and where there are so many varieties,


Portion of fruit exhibit at Sturgeon Bay Fair, 1909.



Birds-eye view of Gays Mills, Wis. This view was taken a short distance from our Trial Orchard which is ½ mile east of the village and 300 ft. up.



I cannot pick out two, I could answer that by taking a list and selecting, but for the best two late I would take Brandywine and Enhance.

Question No. 18. Would not the latest strawberries be more profitable than early ones for Wisconsin?

Mr. G. J. Kellogg: It depends on the market.

Mr. Richardson: If you get them too late, you run them into the beginning of some other crop and often on that account the late strawberry is not as good a paying proposition as it might be.

Mr. Pearson: In the list of late strawberries, I do not like to see the Sample left out; that is our most profitable berry.

Question No. 19. Has any member any record of how many strawberries have ever been produced on one acre?

Mr. Nourse: I gave the record of two acres and three acres and also the record of a sixth of an acre, \$206.

Mr. Richardson: I would like to go on record that when you get 4,000 quarts to an acre, in strawberry culture, I think you have done about all that can be expected.

Question No. 20. How many quarts would a single strawberry plant produce planted alone under best conditions, having unlimited room to spread its runners?

Mr. G. J. Kellogg: Five quarts.

FLOWERS.

Q. I would like to ask what was the matter with some budding on rose bushes last season. The budding was done from the 1st to 15th of July; used shield buds of the present season's growth and inserted them in stocks 1 and 2 years old. I removed the wood from the bud and tied with raffia. I thought I was very careful but not one of them grew.

Ans. The next time you try budding be sure your stock is in a thrifty growing condition and the bark separates nicely from the wood. Be sure your buds are well developed and mature. Don't remove the wood from the bud but cut your buds so as to have as little wood on them as possible. Try budding in August and September.—W. J. Moyle.

Q. Name the six best varieties of gladioli for cut flower purposes.

Ans. (Red) Brenchleyensis, Independence; (Pink) America, Shakespeare; (White) Augusta, Marie Lemoine.-W. J. Moyle. Q. What is the best method of transplanting evergreens (white pines)? Trees are about 10 feet high. They were set out a few years ago. I wish to remove them to another place.

Ans. It is doubtful if trees of this size can be transplanted with any degree of success as the white pine is somewhat difficult to make grow even with the smaller sizes. Dig the trees as soon as frost is out of the ground in the spring with as much roots as possible and set, packing the soil firmly about the roots, then keep well mulched and watered.—W. J. Moyle.

Q. Name a broad-leaved evergreen that is hardy in Wisconsin.

Ans. We know of none.-W. J. Moyle.

Q. Name three best trees for street planting.

Ans. No. 1. Norway Maple, Carolina Poplar, White Elm.-W. J. Moyle.

Ans. No. 2. Norway Maple, White Elm, Linden or Basswood.-F. C.

Q. Name the six best varieties of peonies for cut flower purposes.

Ans. Officinalis rubra fl. pl, Le'Esperance, Queen Victoria, Lenora Bramwell, Superba Purpurea, and Festiva Maxima.—W. J. Moyle.

Q. What is the cause of asters turning yellow before they bloom? If caused by insects, what is the best remedy?

Ans. Asters turn yellow before they bloom because of a diseased condition, but no one has yet learned the cause or found a remedy.—Wm. Toole.

VEGETABLES.

Q. What is the best way to plant cucumbers, six feet apart both ways or in drills six feet apart one way, and how far apart should the plants be in the row?

Ans. With the large varieties I would plant cucumbers in hills four by five or four by six, allowing about four or five plants to grow in a hill. With very large varieties, four by six and occasionally six by six is all right.—J. G. Moore.

Q. Do you think we could gain in earliness by transplanting tomato plants from the hotbed into six inch flower pots, then plant them into a larger frame? Which would be the best to cover them, glass or sheeting?



Orchard J. S. Palmer, eight years planted. 1st and 2nd years, potatoes; 3rd, corn; 4th, oats; 5th, corn; 6th, oats and clover; oats cut green for hay; 7th, clover hay and seed; 8th, corn. Ground heavily manured 3 times in 8 years. Trees thrifty and profitable.



Marketing a portion of the 2100 bushels of apples in the Wausau orchard, 1909.



Ans. Earliness in fruiting can be obtained by planting the seed in a cold frame or better, in a hotbed, then transplanting into pots in the hotbed. The best covering for them is glass, although sheeting is less expensive. If very early tomatoes are wanted, the glass is probably better all around.—J. G. Moore.

Q. Last year for the first time I tried raising celery. It grew large but the stalks became pithy and hollow. The variety was Giant Pascal. I blanched by hilling with earth. What was the matter? Was it in the cultivation or in the variety?

Ans. Pithy celery is mostly due to poor seed, the wild and root celeries being pithy, unless care is used in the selection of seed the cultivated varieties soon degenerate. It is possible, though, for celery from good seed to become pithy if, after it is fully blanched, the plant is allowed to dry out, either in the field or in storage. The growth of the heart being at the expense of the moisture in the outer stalks.—H. C. Christensen.

Q. Name the best early tomato, the best extra large tomato, and the most productive tomato.

Ans. No. 1. Preferably the "Buckstaff," but seed is not yet catalogued this year. Second best "Chalk's Early Jewell."

Ans. No. 2. Henderson's Ponderosa.

Ans. No. 3. Late Stone .- N. A. Rasmussen.

Q. How shall I proceed to graft a tomato on a potato?

Ans. It is assumed that greenhouse facilities are available. The potatoes are started in 6-inch pots or in flats, and the grafting is done on good stout potato stalks four or five days after they have come out of the ground. It is well to select a cloudy day rather than a sunshiny day as the transpiration of moisture from the plant is not so great at that time. Select a fresh, vigorous terminal stem from a tomato plant, about three inches in length. The stem should be large enough so that a whip graft similar to the cut used in root grafting can be made. The cuts should be made as rapidly as possible, and the tomato stem grafted onto the potato stem about one inch above the ground, making sharp, straight cuts. Bind the cuts together with raffia, being careful to avoid against evaporation of the cut surfaces, by thoroughly covering with the binding material.

It is just as well that the potato should be a little dry just before grafting, and then watered thoroughly after the tomato cion is inserted. Use a stick in the flower pot to bind the plant to, so that there is no strain on the union. It is also advisable to allow

potato stems to sprout out from the region of the cut surface until after the tomato has become established. The grafting may be done in April, and after the union is established, the plant may be set out and grown under garden conditions during the summer, or the plant may be matured under greenhouse conditions.— J. G. Milward.

Q. Do you consider arsenate of lead a good solution for spraying vegetable plants?

Ans. Whenever it is possible to control an insect pest of vegetables by spraying with some arsenical compound, I believe arsenate of lead in general is best. It is not liable to damage the foliage as other arsenical compounds, and it sticks to the plants better. Better spray early in order to get the insects at the start rather than later when it will be less efficient, and more apt to damage the sale of the product because of the presence of the arsenical compound. With careful spraying, not enough of the arsenic could get on in any amount to harm the consumer.—J. G. Moore.

FRUITS.

Q. Why is cherry growing such a success in Door Co. Peninsula? Will cherries grow equally well in other parts of the state? Which is the best winter apple section of the state?

Ans. No. 1. The Door Co. Peninsula is located between large bodies of water. Has lime stone soil, late spring, frost proof, making ideal cherry country as well as for apples. Cherries will not do as well in any other portion of the state, at least it has never been proven that they will. Fourteen years here is what we base this statement on.

Door Co. produces varieties of apples that are practically winter varieties while the same varieties grown in any other portion of the state are only late fall and early winter. Door Co. and the Lake Shore produces winter apples remarkably well. Trees less liable to blight, lime stone soil making it perhaps the surest apple section of the state, all things considered.—D. E. Bingham.

Ans. No. 2. Cherry growing has become successful in Door county in part because of favorable conditions of soil and climate but largely because of the energy and good sense of those who have made it successful. It seems quite certain that there are other areas in the state where cherry growing could be made a success. Cherry growing could be made fairly successful in Sauk county and other portions of the state away from the lakes if they were grown in sufficient quantity to leave a surplus after the birds have collected their tribute.—Wm. Toole.

Ans. No. 3. Slow coming of warm weather in the spring gives them immunity from late frosts. Nearness of large bodies of water is also another cause of immunity.—C. A. Hatch.

Q. Will cherries grow equally as well in other parts of the state?

Ans. Yes, on the "ridges" of Richland and Crawford Counties.

Q. Which is the best winter apple section of the state?

Ans. Do not know .-- C. A. Hatch, Richland Center, Wis.

Q. Will cherry trees do well in the greater part of Wisconsin or will they do well only in Door Co.?

Ans. Not reliable in central part north of Oshkosh. O. K. elsewhere.—F. C.

Q. Is it necessary to plant apple seed in the fall so as to have it freeze in order to have it grow the following spring?

Ans. No.

Q. If so, won't it answer the same purpose to pour a little water over the seed, let it freeze and plant it early in the spring?

Ans. Yes. Apple seeds should be kept moist and cool. Pack in damp sand and bury outdoors or in cool cellar. Not absolutely necessary that they be frozen at all.—F. C.

Q. Can cherries be grown profitably in a rolling sandy loam, location, Langlade Co., Wis. Would birds be a serious enemy, frost, fungus?

Ans. No. 1. I would not think cherries could be made very profitable in Langlade Co.

Birds often are serious enemies where woods surround the orchard and cherries are grown in limited amount. Otherwise not serious.

Frost is serious consideration. Fungus is serious unless spraying is practiced, but is controlled by spray.—D. E. Bingham.

Ans. No. 2. I know of no reason why cherries would not succeed in such location.

I have never known birds to be a serious enemy where more than six or eight trees were planted, and that number will usually supply all of the birds in that neighborhood, and they do not travel far. I should say that there ought to be no danger of killing frosts on rolling lands.

I should think that in a new country, such as Langlade County, there would be no danger of fungus diseases for at least twenty years.—W. S. Hager.

Q. Will apple trees do well on low land which can be drained so that no water will stand on it? The soil is sand and marl mixed with a number of sea shells mixed with it on top of which is muck?

Ans. Not advisable to plant apples on such land no matter how well drained.—F. C.

Q. About what is the average life of the Early Richmond and Montmorency cherry trees in Wisconsin?

Ans. Depends on care, 20 to 25 years. May live 50 .- F. C.

Q. Are any or all of the following varieties of fruit raised in Wisconsin? Either on a big or a small scale? Peaches, Quinces, Apricots, Nectarines and would a person make a success of raising a few of each kind?

Ans. None of the fruits mentioned are hardy in Wisconsin nor should any of them ever be planted with the idea of growing the fruit for sale. It is often possible to raise peaches if sufficient time and money is expended in winter protection.—F. C.

Q. Is it a fact peaches will do as well in Wisconsin as anywherelse if protected a little during winter?

Ans. It is not a fact.-F. C.

Q. I have a few very strong growing winter varieties of apples. May I graft any kind of apples on this variety? Summer, fall and winter apples.

Ans. Certainly; cut out half of the tree and cleft graft. Then when the grafts are well established, say two years, cut out the balance of the tree and give the grafts full possession. It is not advisable to graft more than one variety to the tree as no two varieties grow alike and it is hard to get a balanced top.—W. J. Moyle.

Q. I have an orchard of about 20 years of age and it has not been cultivated for many years. Would you advise me to plow and cultivate it? I find it quite difficult to keep the above orchard pruned. The more I prune the bushier the trees get. I will be very thankful for any information on the subject.

Ans. Cultivate the orchard shallow and if soil is rich do not fertilize for a while, and if what you say about pruning is true,

196

better stop pruning, but I would advise annual pruning and removing of water sprouts during growing season.—D. E. Bingham.

Q. Is it better to graft apples in March than April?

Ans. No. The best time is just as the buds are bursting on the stock, but the scions should always be dormant. Scions can be cut and inserted the same day if they have not started. I have succeeded in grafting in warm days in February, if the wax works nice; if too cold, wax even from warm water does not do as well. If scions are kept dormant and on ice in sawdust they can be successful as late as June 10th; then I have had 90 per cent grow.—Geo. J. Kellogg.

Q. Can we successfully graft pears on apples and apples on pears?

Ans. No. The stocks do not unite well.

Pears on Quince to dwarf them.

Pears on Mt. Ash are practically successful.

Pears on wild thorn plum are a success, but do not take as well as on seedling pear stocks.

Plums will succeed on peach stocks and peaches on plum, but do best on seedlings of their own class.—Geo. J. Kellogg.

Q. I have not been successful in grafting. How shall I proceed in order to make a success of it?

Ans. It is assumed that root grafting is referred to, and the question presupposes a knowledge of the mechanical process of grafting. Order roots and cions late in the fall. Roots and cions should be stored in a cool, moist place, and not exposed to alternate freezing and drying. Leaves gathered in the fall are very desirable for storage purposes. Moist sand (not wet or sloppy) and moist sawdust is also desirable. Grafting may be done during the winter months, and the finished grafts stored as indicated above.

Make good, long, straight, sloping cuts. The unions should be about three-quarter inch in length. Use the piece root method and make root sections two and one-half to three inches long, and the cion sections about 5 inches long. Bind the cut surfaces tightly together, uniting the cambium of the stock and cion on one side. Grafting cloth is preferable for binding. The finished grafts should be carefully stored in a cool, moist place and kept dormant. Avoid sprouting. When spring opens, plant out in the nursery row, leaving but one bud exposed.—J. G. Milward.

Q. Will the Compass cherry stand the winters of northern Wisconsin and is it of any value as a fruit?

Ans. The Compass cherry is fully hardy anywhere in Wisconsin. The fruit is somewhat better than the choke-cherry in quality but not much. Tree larger and prolific. Where no other fruit can be grown the Compass is of some value, but not nearly as good as even the poorer varieties of native (red) plums.—F. C.

Q. Are the Salome and Windsor Chief adapted for a commercial and family orchard in southern Wisconsin?

Ans. Yes.-F. C.

Q. My pear trees blossomed and set fruit last year but soon they commenced to fall off until every one was gone. What was the cause of this and what can I do to prevent this happening again?

Ans. This was due to some atmospheric conditions such as frost, rain or dry weather. It may never happen again.—W. J. Moyle.

Q. What is the best blue plum that will stand the Wisconsin winters?

Ans. We have none fully hardy. Moore's Arctic and Lombard come nearest.-F. C.

Q. Could cherries be budded on our native stock (choke, black and red, all wild)? If so, which kind would be best? Would not trees budded on this stock be hardier in this climate?

Ans. None of the native cherries furnish a congenial stock for the cultivated cherries. It is wholly impractical and any attempts in this direction will be a waste of time.—F. C.

Q. I have a few plum trees. They always blossom and set fruit but it always falls off. What shall I do?

Ans. If the plums turn black and fall immediately after setting, the indications are that the brown plum rot is the cause of the trouble. Spray with Bordeaux mixture before blossoming and immediately after the fruit sets. This will lessen the damage. If the plums fall when they are about the size of marbles, it may be that they are infested with the curculio or gouger. In that case, attention should be given to control the insect by spraying and by the catching method.

Some plums show a lack of ability to mature their fruit, and this has sometimes been attributed to improper fertilization of the blossoms. In a mixed orchard where many varieties are planted, this trouble should not be prevalent.—J. G. Milward.

198

Q. Can apple trees be set twenty feet each way and never thinned, if they are properly pruned?

Ans. No. 1. In most portions of the state certain varieties will be more profitable twenty feet, such varieties as Wealthy, Yellow Transparent, Windsor, Chief, Longfield, Newell, Duchess, etc. Pruning will, if properly done, do a great deal to control distances. Northwestern Greening, McMahan, Snow, McIntosh, Dudley, etc., about twenty-four feet is better.—D. E. Bingham.

Ans. No. 2. No; not for any of the spreading varieties; 24x32 would be much better for orchard planting.—A. J. Philips.

Ans. No. 3. Yes, but they will need thorough pruning and heading back as they get large size. Keep the head compact, but keep the center open to let in the sun to color the fruit.— Geo. J. Kellogg.

Ans. No. 4. Given a sunny exposure I believe trees twenty feet each way can be grown and fruited successfully if pruned with open heads. Of course some varieties are more rank in growth than others, but Wisconsin does not grow as large trees as some other states.—Dr. T. E. Loope.

Q. What is the value of ferrous-arsenate as compared with arsenate of lead as an insecticide?

Ans. As a rule, use only standard, well tried insecticides. Ferrous-arsenate has not been tried sufficiently to compare its value definitely with arsenate of lead or Paris Green. Until the ferrous arsenate has been tried out and the results published, arsenate of lead or Paris Green should be preferable.—J. G. Milward.

Q. What is best spraying solution for pears?

Ans. Bordeaux mixture for scab and other fungous diseases: add arsenate of lead for codling moth and all eating insects. Pear blight, indicated by blackened foliage and twigs in summer cannot be controlled by spraying.—F. C.

Q. What sprayer can I get that will not clog and have plenty of force. I mean a hand sprayer?

Ans. Any sprayer will clog unless the spray mixtures are properly strained. Use high pressure, 100 to 110 lbs.—F. C.

Q. How am I to prune grape vines?

Ans. (a) For pruning the vine and roots at planting time see Fig. 1, opposite page — of this volume.

Ans. (b) For pruning the vine the first autumn after spring planting see Fig. 2, opposite page — of this volume. Should

the vine appear weak prune back to two strong buds the same as at planting time.

Ans. (c) If your vine has flourished the second year you would have in autumn two horizontal arms, each having two or more vertical shoots. See Fig. 4, page opposite ——.

Prune back to the horizontal arm every other shoot, leaving thereon one strong bud for a renewal cane. Those left should produce fruit during the third year. The buds left near the horizontal arm in the spring of the third year have produced shoots which in turn will produce the fruiting wood for the fourth year. It is hardly possible to answer this question very satisfactorily to a beginner but the principle may be grasped easily. Keep constantly in mind that some wood grown this year must be left. From this new wood arises fruiting wood for next year.—G. W. Reigle.

Q. Will grapes do well on sandy stony soil facing south?

Ans. Yes, providing there is enough fertility in the soil to grow corn or potatoes. Plant Concord, Worden, Moore's Early, Delaware and Diamond.—G. W. Reigle.

Q. Is it best to alternate rows of Greenings, Snow and Wealthy or can I put two or three hundred of each in one bunch?

Ans. I do not think it will be advisable to plant these varieties in blocks of two or three hundred trees. While they may be practically self fertile, nevertheless as a rule, cross fertilization gives better results than self fertilization. Therefore, I think it would be better to alternate the rows, having perhaps four or five rows of each variety, and then use for the next series, some other variety.—A. J. Rogers.

Q. In propagating young nursery fruit trees (especially apple trees) is there any preference as to any of the following methods used: Budding (splice graft and split stem graft just above the surface of the ground); graft spliced onto the whole root of a seedling tree or onto a piece of root of a seedling tree? If there be a preference in any of the above methods, which is the best and why? Does the method used effect in any way the health and growth of the tree? Will the use of any one of the above methods of grafting or budding tend in any way to produce an abnormally black heart or unsound or unhealthy condition? If so, why? If any of the above methods of propagation have defects what are they? The seedling to be budded or grafted should be of what age, Will a two year, three year, or older

200



Typical tree, Wausau Orchard, August, 1909.



Wealthy tree in the orchard of J. E. Bissel, Madeline Island, Oct. 1909.



seedling be as suitable as a one year old seedling? When a piece root is used, what should be the length or size of same? Should the graft contain more than two buds?

A. It is very doubtful whether there is any great difference in propagating apple trees by budding, splice or tongue graft, near the surface of the ground. None of these methods are strongly advised for Wisconsin conditions. Root grafting is the method which seems to give the best results in this state, probably due to the fact that where trees are root grafted, and by this we mean indoor grafted in winter, it is possible to secure the trees later on their own roots. There is little to choose between whole and piece-root grafting so far as the character of the resulting tree is concerned. Piece root is somewhat more economical. The piece of root which is used should be about four inches in length. I should say that the cion should contain more than two buds as a rule.

We believe in making our cions from four to six inches in length so that they may be planted deep in the nursery row in an attempt to secure roots above the union of the stock and cion, thus giving us "own rooted" trees. In planting into the nursery row, the grafts are set so that about two buds are exposed above the surface of the ground.

As a rule, one year old seedlings are preferable for root grafting. It will depend somewhat upon the growth which they have made. The only objection which could be raised to two year old seedlings is that they may be too large for securing the best unions owing to the difference in size between the cion and stock.—A. J. Rogers.

Q. Is artificial planting of nuts a success in Wisconsin?

A. Growing of nuts commercially in Wisconsin has not been carried on extensively enough to warrant its being recommended for commercial ventures in this state.—J. G. Moore.

Q. Why have the seedlings originated at the Experiment Station not been disseminated?

A. Probably no one is better able to answer this question than those connected with the Horticultural Department of the Station. It is true that some of the seedlings, particularly the apple seedlings which were started by the late Professor Goff have been growing at the Station for some time. It has been the policy of the Department, however, to test out seedlings pretty thoroly, before making any attempts to propagate them on a large scale.

The multiplicity of practically worthless seedlings which have been put out before they have been thoroughly tested has been a hindrance to the advancement in horticulture rather than a help. It is therefore the policy of the Station to know pretty definitely what may be expected of the seedlings before they are disseminated.

This work is now being carried on as rapidly as could be expected, and it is hoped that in a comparatively short time the Department may be able to send out trees of some of the sorts which seem to give indications of being of superior merit. During the present winter, there is being propagated at the Station a large number of seedling apples and plums which will in the future be given trial in various parts of the state.—J. G. Moore.

Q. I have some Northwestern apple trees on which the fruit rots badly every year. I suppose it is what is called bitter rot. Can it be prevented? I have sprayed them several times early in the season, but they continue to rot when the fruit is full grown.

A. If the disease which is effecting the Northwestern apples is bitter rot as supposed by the inquirer, then spraying is valuable in its control. The bitter rot not only attacks the fruit, but also the trees as well. One of the first things then in the control of the disease is to remove the cankered areas the same as for the regular apple canker.

We presuppose that the ordinary spraying for apple scab has been given, and the further control would be the application of Bordeaux mixture during the latter part of June and through July for the control of the bitter rot. This disease does not appear as a rule until early in July. As the application of Bordeaux is only preventive, the spraying must be done prior to the appearance of the disease.

Probably the reason why the inquirer has failed to get returns from the spray in the past is that the Bordeaux which he applied early had been washed from the trees before the appearance of this disease.—A. J. Rogers.

Q. Is the black Walnut hardy enough to prove a success in the northern part of Wisconsin?

There are several small trees in the city of Barron. These have been here about twenty-five years and though small, are in fairly good condition. The tree does much better on the bottom lands about St. Croix Falls than it does farther inland. I would say in general that the black walnut can be grown as a small to medium size shade tree in northern Wisconsin.— Prof. L. S. Cheney.

The President then introduced Mr. C. O. Drayton, who spoke as follows:

Mr. Drayton: It gives me great pleasure to be present in this meeting this afternoon. I live in southern Illinois, in a land of apples, and I have the honor of being a life member of the Horticultural Society of the State of Illinois, so I am deeply interested in the problem that you are discussing here this afternoon. I do not mean by that that I am a scientific horticulturist. I am afraid there is a great deal about it I do not know. I happen to be in your state representing the interests of our Society. I presume some of you have heard of the American Society of Equity. One of the objects we have in this movement is the intelligent distribution of crops to the consumers. I do not know how much you have discussed that phase of the question here today as to the marketing of your apples, but it does seem to me that is a very important phase of the subject. I saw in the papers the other day that they have formed in Delaware a \$5,000,000 apple trust. I wonder what that means? I wonder if that is a combination of growers or buyers or consumers; it is some kind of combination. It is nothing unusual now-a-days to hear of the formation of a new trust, but we farmers generally are very shy on that subject of trusts. The American Society of Equity is an organization of the people, not a combination to put high, extortionate prices upon the consumers, but to drop the buyer that is in between, that robs both the producer and the consumer. I say, that is one of the objects that we have. Let me give you briefly an illustration of what I mean from actual facts. In 1906 we had a fine crop of apples, the quality was good also. The growers hauled apples into Greenville, Ill., where I now live, and the buyers picked out everything almost that was not perfect, then gave us sixty and seventy cents a barrel for our apples; it cost ten cents a barrel to put them in barrels and put them on the cars at Greenville, Ill., that made eighty cents for our apples, the barrel was 30 cents, which made \$1.10; the freight to St. Paul was about 51 cents, so that our best apples laid down in St. Paul ready to retail in 1906 only cost \$1.61 a barrel, but if you will go up to St. Paul and find out what the

204

retailers actually paid, you will conclude at once as apple producers that there was too much difference between the producer's price and the consumer's price. I only bring this subject before you as a suggested one today, that you may think about it and discuss it. The American Society of Equity has for its principal object the intelligent distribution of all crops to the consumers. We believe the consumers very often pay so much for our apples that the price actually becomes prohibitive, therefore there ought to be some way by which we can have an intelligent system of distribution from our orchards, our large commercial orchards especially, to the consumers. Now, one way that I would suggest, it is a problem that we are working at, we do not claim to have solved it, but we are organized for the purpose of discussing these questions and solving problems-one way that we have tried is that of our members at Interlaken, N. Y., who have shipped to the local union direct in St. Croix, and some other counties of this state, and in this way we have been able to get the producer 80 cents a barrel more for his apples and the consumer gets them \$1.00 a barrel cheaper. We believe there are too many organized forces in between the producer and consumer and that by an organization upon this plan, that the producers, not only of apples, but other farm products can break the power that is in between. Before I leave, I would like to know if there is present in the house a member of the American Society of Equity. Yes, one, two three, four, five-eight.

The President: I want to thank the gentleman for the able manner in which he has presented this subject to us. I think there is a strong inclination to know more about it and about the extent to which that society is helping the producer and I think the consumer also.

Mr. Drayton: I hope I have created curiosity enough for you to want to kiow more, that is what I wanted to do.

MY IMPRESSIONS OF THE WEST.

W. W. CLARK.

"My impressions of the west" are not more than impressions, they were obtained in a stay of some two and one-half months, mainly near the head of the Willamette valley. This valley is in the western third of the state which is watered by the rains sufficiently to produce satisfactory crops without irrigation. The vegetation is somewhat similar to that of Wisconsin.

The rainfall around Creswell and Eugene is about 36 inches, nearly all of which falls during the months of September to June, leaving a dry season of two to three months. This was the season which I observed. The rain is generally not severe, being more like Wisconsin mist. During the summer dry season crops can be grown in the field and garden without irrigation of any kind by suitable methods of cultivation. There is no doubt but that small fruits would do better during this time with artificial watering, however.

Tree fruits do very well without irrigation provided the soil moisture is conserved. It is claimed, in fact, that they do better because of the dry season during their ripening period than they would otherwise. This seemed to be true.

Agriculture in this portion of Oregon is in a very backward condition as regards modern methods, etc. The same land has been cropped without rotation for decades in many instances and appears nearly exhausted. Eastern farmers are introducing modern methods of rotation and handling, but these are not kindly accepted by the "native Oregonians," who fail to see how the eastern farmer can know anything about conditions in Ore gon. As a consequence of the influx of settlers from the middle west and east, Oregon is waking up to her resources and oppor tunities, however, and the entire state is experiencing a "boom."

In horticulture, modern practices in spraying, pruning, planting and cultivating are followed closely. This is perhaps from necessity, it being almost impossible to raise *any* edible apples without careful spraying. As a result many home orchards are of no value to their owners, whatever; the marketable apples coming from those growers who understand their business. The contrast with Wisconsin conditions is especially marked, since

206

here many of our apples come from these "home orchards" which are given no attention whatever.

Prunes are an important crop of western Oregon and Washington, bringing in excellent profits. They require less care than most fruits grown there. Cherries are an important product early in July. Pears and peaches are increasing rapidly and make an excellent showing, fine peaches being produced on threeyear-old trees. Small fruits are important also, the home demand being greater than the supply of raspberries, Loganberries, etc. These small fruits grow and yield luxuriously, especially when artificially watered. Their quality is excellent. Walnuts are still an experiment, notwithstanding the fact that plantations of walnut trees are set out and cared for by some enterprising corporations, for eastern buyers.

Fruit of excellent quality has been grown in western Oregon for many years but only recently has it been possible to market it with profit. This condition has been brought about by fruitgrowers' unions. No enterprising grower now tries to market his fruit in any other way.

My impressions of Oregon during my short stay were most pleasant. The cost of living is no higher there than here, in general. Houses may be built for half what they cost here and the same is true of all wooden buildings. The summer climate is tempered by regular sea breezes for seventy or eighty miles from the coast, so that discomfort from the heat, even when working in the field is rare. It does occasionally get hot, however. No ploughing is attempted usually before the rains soften the ground.

After leaving Oregon I visited the irrigated regions of western Washington for a short time. Here, as was to be expected, the growth of young orchards was much more rapid than in the non-irrigated Oregon lands. The climate, however, was execrable to one coming from the east or from the coast. Dry, hot, dusty, windy, barren—the newly developed irrigated tracts seemed very unattractive. The fabulous tales of immense yields and \$2,000 land seemed probable enough, however. This last season had been very unfavorable and unusual one from all reports. No peach crop was harvested in the Yakima valley and the apple crop was much reduced.

Leaving western Washington, the return trip was via the Canadian Pacific. Tales of the magnificence of western scenery

were found not to have been exaggerated, but the green trees and lawns, the yellow cornfields dotted with golden pumpkins and the freshness and civilization of Minnesota and Wisconsin seemed very welcome to eyes wearied with western wonders.

THE SMALL FRUIT PLANTATION.

R. L. Post.

The conditions which determine the location, planning, and management of a plantation for small fruits are so numerous and varied that it will be possible to give only a few scattered suggestions as to some of the factors which enter into the successful management of such a plantation.

In presenting the following suggestions I shall consider mainly the plantation which supplies a local market.

In this brief paper I shall make no attempt to define a sysem of laying out the plantation, because that will depend to a greater or less degree upon the extent and topography of the land, and upon the character of the soil. Neither shall I give advice as to the varieties that should be grown, since this depends even more upon the peculiarities of soil and climate, also upon the methods of culture and upon the kind of market.

The first suggestion which I wish to make is this—that as a general rule a large number of fruits, together with other crops, is preferable to an excess of any one fruit. By this I do not mean to convey the idea that special emphasis should not be placed upon a certain crop, or crops, but for reasons which are to follow there should be a liberal sprinkling of other crops. Of course it cannot be denied that decided advantages arise from specialization, but I believe that for a retail market it is much more profitable to adopt the plan which has been indicated.

In the first place it necessitates the proper handling of the soil, or, in other words, it brings about the practice of rotation, with all the benefits accruing therefrom. One of the most important things to consider in this connection is the combating of insect and fungus pests, for by varying the crops on a given piece of land the life processes of these pests are seriously interrupted, if not entirely suspended, thereby decreasing materially

208

the extent of damage they may cause. This is especially true as regards those pests which cannot be held in check by spraying, although the same principle applies to the others as well. For this reason alone it would seem the diversification for the purpose of rotation were more than justified. Perhaps this may appear to be a rather sweeping statement, but to those who have seen, for example, a strawberry bed almost wholly destroyed by the white grub, it will not seem unreasonable.

I suppose it is scarcely necessary to speak of the other benefits derived from rotation. One of these is the maintenance of good physical conditions in the soil, which results in the greater availability of the fertilizing constituents, with a consequent superior quality of product. An economical use of the fertilizing elements is another important advantage. The utilization of labor which results from rotation and diversification will be discussed under a different head.

Perhaps the most common error which a grower is apt to make in connection with rotation arises from the fact that a particular piece of land seems peculiarly adapted to the production of a certain crop. For the mere reason that the crops are better than the average the first year or two, he is inclined to assume that such a condition of things will continue indefinitely, and will not only defer turning under the patch until after it has seriously declined in usefulness, but even after it is plowed he will replant it with the same fruit without devoting the land for more than a year or two to the growth of unrelated species, such as vegetables. We are apt to forget that a setting of small fruit occupies the land for a number of years, instead of one year, and that other crops in the rotation should be grown for a corresponding length of time. True, it may be possible so to care for the plants that the same fruit may be produced successfully for a long period, but it is evident that, with increasing age, the difficulties of maintaining proper tilth, fighting weeds, and controlling pests will necessitate a greater and greater expenditure of labor and money.

The second object of growing a wide range of products is to make possible the development of a comparatively fancy trade. We know that in most cities almost every consumer has a somewhat different taste from that of his neighbor, and therefore it behooves the grower to take advantage of these preferences. In so doing he will almost unconsciously exercise greater care in growing, harvesting and marketing the crop than he otherwise

would, thus producing a better quality of fruit. This would result in an increased demand for the product, which means that the grower could command higher prices.

A third advantage of having a large number of classes and varieties is that it makes easier the disposal of the fruit at a reasonable profit. This is true partly for the reason which has just been mentioned, that the demand is apt to be greater than when only one or two kinds are for sale. Further than this there is not apt to be an excessive amount of any one kind placed upon the market at a given time.

One thing which I believe is neglected in a large number of cases is the economical utilization and distribution of labor. The first of these has been mentioned in connection with the subject of rotation, and it may readily be seen that a large number of different crops are necessary if the labor is to be kept busy all the time, because in many instances the various crops supplement each other.

Assuming now that we are able to utilize the labor and equipment to the best advantage as regards time, the next problem which presents itself is how to gain the maximum profit per unit of time and labor expended. It is obvious that some crops are more profitable than others, and in most cases these are just the ones which require the most care. On the other hand, the grower. realizing the importance of a particular crop, may give it more time than is profitable at the expense of another crop, which, though less profitable, would yield better returns for this extra amount of labor. Not only this, but small patches upon the plantation will be entirely neglected, thus becoming breeding places of weeds, diseases, and insect pests. In these cases it is undesirable to neglect the patch, even though no immediate profit is the result, since it results in seeding down the premises with weeds, as well as infesting the remainder of the plantation with noxious forms of insect and fungus life.

There is one phase of small fruit growing which I believe ought to be emphasized, and that is home experimentation. With small fruits it seems to me that this is almost an absolute necessity, because the success or failure of many varieties depends solely upon the particular locality in which they are grown. Home experimenting is of advantage for two chief reasons. The first reason is that the grower is enabled to see results for himself without taking somebody else's word for them. He knows exactly

14-H. S.

what conditions have been supplied and the effects which those conditions have produced. The facts cannot be questioned and he is obliged to accept the truth whether he wishes to or not. Furthermore the actual observation of results will leave an impression upon his memory which mere reading or heresay could not begin to make.

The second great advantage arising from home experimentation is that the conditions supplied are exactly the same as those under which the fruit is grown, both as regards soil and climate, and as regards the treatment given the plants. If the experimenting were done elsewhere, some essential difference in conditions might be overlooked.

The chief classes of experiments which might well be conducted on the farm are first, those which are concerned with the trying out of different varieties, and second, those which have to do with various methods of treating those varieties which are already established on the plantation. It is not at all necessary to have an elaborate system of carrying on these experiments; in fact, such a system should be discouraged. Take for instance the trying out of a new variety of raspberries. It is a simple matter, when setting out a new patch, to put in a few plants of the variety to be tested. It then receives exactly the same treatment that is given the rest of the patch, and a fair judgment of its qualities can be made. As a simple example of the second kind of experiment we might take the uncovering of strawberries in the spring. We know that the time of doing this influences the earliness of the crop as well as the yield. It would necessitate very little trouble and no extra work to remove some of the covering earlier or later than when the main portion of the patch is opened.

One of the problems connected with the growing of small fruits is that of giving the plants a good start. One factor which is essential for this is to be sure that the soil is in proper condition to receive the plants, but this cannot be discussed here. Another factor is the proper setting of the plants. The third factor is one which is concerned with the plants themselves, and this is the one which I wish to dwell upon.

Now what are some of the essential qualities of a plant which is about to be set? In the first place it should be sound, vigorous and healthy, so that it will lose no time in becoming firmly established in the soil before the possibility of injury by drought,

insect and fungus pests, or other adverse conditions. Secondly, the plant should be adapted to local climatic and soil conditions, for, no matter what is the excellence of its condition, it will always be handicapped if it is not adapted. Another desirable quality is resistance to disease, although this is not so important if precautions are taken concerning rotation and cleanliness.

How shall we manage to secure these desirable qualities? There seems to be but one safe and sure way, and that is to propagate and select the plants for ourselves.

The first advantage of home propagation is that the grower can have a large number of plants on hand, and can select those which are in the best of shape as regards size, vigor, and soundness. He can manage so that the plants will not be out of the ground for too long a period, because he knows when he will need them and can suit his own convenience. The plants do not have to be handled so much as they do when shipped, and consequently are not apt to lose vitality. It is obvious that with all these advantages the plants have the best possible opportunity of getting a good start.

If the plants have been propagated on the same plantation upon which they are to produce fruit it necessarily follows that they are more likely to be adapted to local conditions than if propagated a number of miles distant. We know how susceptible the strawberry is to changes in location. A certain variety may do perfectly well on one plantation, and if thansferred to another, or even to a different place on the same plantation may be a total failure.

The third advantage of home propagation is that the worry and trouble incurred in ordering and shipping the plants is obviated. As a general rule it is little more trouble to dig the plants than it is to take care of them after they are shipped, and of course, they cost nothing in the way of money. There is little possibility of making mistakes, and, if any blunders are made, the grower has nobody but himself to blame.

Another prominent factor enters in when home propagation is practiced. The work is under the direct personal supervision of one who is to take the consequences of his own labor, and as a result he will exercise more care than anybody else would. He has first choice of the plants, does not have to accept inferior stock, and therefore is less troubled with killing out, and the labor and expense incurred in replanting. Finally, if a person propagates plants for his own use he will become a keener observer of the characteristics of the plants with which he is dealing. He is obliged to look into the details of their make-up and development, and this is conducive to success, not only in the growing of small fruits, but of other crops as well.

I have touched upon only a few of the factors which, to my mind, influence the degree of success to be attained in the management of a plantation for small fruits. In some instances I may have drawn defective conclusions, but I believe that most of the things I have mentioned are worthy of our consideration.

THE DOOR COUNTY FRUIT DISTRICT.

A. L. HATCH, Sturgeon Bay.

The continued success of fruit culture at Sturgeon Bay is now attracting considerable attention. Especially is this true of cherry culture, which is expanding rapidly. In common with most of the Door county peninsula this region has some advantages for the growth of several fruits which have been demonstrated to be very valuable and reliable for every season. In fruit culture, as in every other business, success depends upon certainty of returns. Where conditions favor full crops every year and where the fruit develops to perfection, and where it has perfect shipping qualities, there exists the foundation for profitable commercial fruit growing. And when these conditions, are supplemented with good shipping and marketing conditions, and when the business is already well established for co-operation among growers, there exists still further advantages.

In all of these the Sturgeon Bay region is especially fortunate. The first planting of fruit trees in considerable quantities were made about fifty years ago and during all those years there is no record of a loss of bloom by spring frosts. This is a record assuring a greater certainty of crops than is found elsewhere in most of the so-called fruit regions.

We have at Sturgeon Bay a cool spring long drawn out that prevents such early bloom, and gives fruit trees a chance to make a strong recuperative start of buds and bloom that has



Wealthy, orchard L. H. Palmer, Baraboo, planted spring of 1900, bore 1 barrel choice No. 1 apples in 1907 and heavy crop, 1909.



Fameuse, orchard of J. S. Palmer, Baraboo, age 25 years. Cultivation, alternate clover sod and cropping with corn followed by oats. Heavily manured every 3 or 4 years. Four hundred similar trees bore 1000 barrels, 1909. (See Rep. of Sec.)



great capacity to endure frost if it should occur. Not only is the bloom thus made hardy but the severest cold to which trees are subjected is abated in such a way that no injury results. These conditions are brought about by the influence of the lake and bay water upon the climate. And these influences are permanent and reliable—something to be always counted on as a factor in fruit culture here.

Another asset of this water influence upon the climate is its effect upon the character and quality of the fruit itself. This is very markedly shown in the keeping and shipping quality of the fruit grown here. Never subjected to the long continued and high temperatures of regions south and inland the fruit of all kinds has a firmer and better texture usually that adds very much to its life and capacity to endure shipment without hurt. Of all the cherries, for instance, that I have grown here, amounting to several thousand bushels, I do not remember any loss from failure to hold up in shipment. Any variety of apple that we grow will keep much longer than the same variety grown elsewhere in Wisconsin. Not only can we end the market with Duchess and Wealthy when others have done, but we can furnish such sorts as Snow apples in fine condition well into winter. And still more we have some kinds that will keep till spring as sound as desired. These facts point to a fine field of profitable apple culture that is now beginning to attract some attention.

The soils of Door county peninsula are founded upon Niagara limestone. Both in the pine and hardwood region it is a very valuable factor for fruit growing. When properly selected especially with reference to depth above the bed rock, subsoil and exposure, it ranks well with that of any other region. Here clover and all grasses thrive finely, assuring the conditions to secure desired humus and soil enrichment.

The first commercial planting of the cherry was made in 1896-8 by myself and the late Prof. E. S. Goff of Madison, Wis. In the latter year I induced Mr. A. W. Lawrence to plant five acres and from the success of these and other orchards the possibility of very profitable cherry growing has been fully demonstrated. Ever since the trees were large enough to bear they have borne paying crops, the combined crop of last season amounting to over seven thousand crates or about 13 carloads. For a series of five or six years the average net returns would capitalize the land at over \$3,000 per acre. There is promise of some younger

orchards doing better than this for in the case of my own orchard it should be understood that in it I have tried out several varieties that were unprofitable. I also made some mistakes of planting and management that are now being avoided by later planters. It is a pleasure to know that many younger men are now engaged in a broader and stronger development of this splendid industry.

NOTES ON GARDENING.

BLANCHARD HARPER.

A Protecting Screen.

The idea is not original, none of mine are, merely adaptive, or adopting—I can not remember where I read it originally, but as I use it, it is as follows:

Get a number of heavy pieces of galvanized iron wire, Nos. 10 or 12, I think, cut into four feet lengths, then procure a number of yards of "tobacco" (i. e., that used to screen tobacco plants) cheese cloth, in which tucks half an inch deep are run, at intervals of seven and a half feet. Run a wire through each tuck so that six inches projects beyond the cloth on each side to be stuck in the ground. In case of a high wind it is advisable to pin the windward side to the ground between the hoops. I use mine as a protection against spring and autumn frosts, summer sun, and when watering a favorite row during a drouth. It enables me to lengthen the season of tender vegetables about six weeks every year. In the autumn, when the snow flies, I have the cheese cloth washed and use it year after year, and have done so for three years. I have also light frames fitting in place of my cold frame sash covered with cheese cloth, instead of being filled with glass, which I use to start young seedling in hot summer weather. It is a great protection also against a burning summer wind, or a beating rain. I always remove it at night in hot weather and replace it in the morning as long as needed, and in cold weather, put it on at night and take it off when the sun shines. It is particularly useful in transplanting young lettuce, asters, endive, celery, etc. Try it!

Lettuce.

Many home gardeners do not appreciate the vast difference in the many varieties of lettuce offered in the catalogues, and very few realize that there is a greater difference in the success in growing lettuce due to the selection of a variety suited to the soil of the garden. Lettuce likes a light, mellow soil, but suppose the home garden is composed of a hard, yellow clay soil, or a peaty, marshy soil, shall the gardener forego lettuce? By no means, but in order to win success, he must try many different varieties and then select the ones which do best in his soil. A marked instance of this suitability came to my notice last year. A new neighbor who had recently come from Michigan, where his garden had been on a reclaimed marsh, asked "What lettuce grew best in our location ?" He named over a number of varieties, Big Boston and others, to all of which I objected as having been failures with me, being tough and bitter. Then I named the varieties I had found suited to the soil and location. "Well" he said, "I am going to try both your kinds and mine. My varieties did so well with us. I hate to give them up, but I will take your advice and plant your selection too." He did so. and could not eat any of the varieties he found successful in Michigan, but found my choice gave him a succession of delicious lettuce until frozen up. Do not be discouraged if your home grown lettuce is poor, send to the Supt. of Public Documents in Washington, fifteen cents, and ask for Bulletin No. 69. Bureau of Plant Industry, Dept. of Agriculture, American Varieties of Lettuce by W. W. Tracy, Jr., and from a study of that select varieties to experiment with your soil.

I unfortunately kept no notes of my first trials, and so do not care after five years to make definite statements in regard to them. I have tried in all about twenty to twenty-five varieties, and for my soil, which is a hard clay, on an exposed hillside, swept by the prevailing west winds, without any pumping or mechanical arrangements for watering, I have found great satisfaction in the following varieties: First choice—May King, Black-seeded Tennis Ball, Crisp as Ice (also called Hartford Bronzed Head) Paris White Cos. Mignonette. Third choice— California Cream Butter, Deacon, Maximum-Hanson. Poor— Grand Rapids, New York, Golden Cos, Big Boston, Iceberg.

I make my first planting in a cold frame, from which I transplant a few heads to the open ground, and eat the remainder thinning it as it grows. I like May King and Black-seeded Tennis Ball for this. Then as early as possible, I plant in the open, five foot rows of May King, Black-seeded Tennis Ball, Mignonette and Crisp as Ice (listed by only one seedsman, that I know of) and any new varieties with which I am experimenting. When these are large enough to transplant. I set out as many as I want in rows one foot apart, and eight inches or a foot in the row, to head. Meanwhile I have been thinning the rows as required and eating what I thinned out. In about two or three weeks I make another planting including Paris White Cos, and my last about August 1. In the last planting 1 make my rows three times as long and thin in the row for heading as well as transplant because I find that transplanting at that time of the year sets the plants back enough to make a much later crop. By covering these transplanted heads, with the cheese cloth screen, or lifting a few to the cold frame. I have had lettuce until the middle of November.

The soil is prepared with manure as usual before ploughing and dragging, and then fined all the old powdery manure raked up from where the big pile stood. that I can rake or work in, I put in. When my seedlings are up, I water the ground once a week or ten days, with a solution of one ounce of nitrate of soda in one gallon of water, and continue to do so until the heads are well formed. When the seed is sowed and watered I cover the ground in hot sunny or dry weather with the cheese cloth screen, and the August planting is grown almost entirely with it until September brings cooler days. Please let me konw the result of your experiments?

216

HINTS FROM AN OLD MAID'S GARDEN FOR HOME GARDENERS.

Beans. Home gardeners are usually limited as to space and time, and therefore will find bush beans and dwarf peas more economical in brush, poles, wire netting, ground space, and cultivation as to area, than the tall growing sorts.

Those who have not tried the bush lima beans miss one of the chief delicacies of the garden. Many suppose that the limas will not ripen here because our season is too short, but I get here in Madison, a good long season of them.

The Fordhook Bush Lima is comparatively new, is prolific although not equal in that respect to Wood's Prolific, early, rich, buttery, and delicious, belonging to the potato lima class.

The *Thorburn* (or *Dreer*) Bush Lima is similar to the foregoing, but much later, bearing until the garden is entirely frozen up. It has been my stand-by for several years, and the beans are delicious cooked fresh or canned.

The Wood's Prolific Bush Lima, an improved edition of Henderson's Bush, belongs to a different class of bean, the sieva bean, and to my taste is not as nice as the two first named, but it is useful as coming between the two first in point of time, as affording a change of variety, and also and chiefly because of its ability to withstand drouth. In my garden last year the Fordhook matured for picking before the drouth, the Wood's Prolific furnished good picking during the drouth, while my favorite Thorburn's were laden with pods which shrivelled and dried up. As soon as the rain came the Thorburn's blossomed and would have had a good crop again, but were frozen down just before the beans were ready to pick.

I plant them all in well manured ground, sprinkling in addition artificial fertilizer over the row at the time of sowing and two or three times more between the time the plants come up and pods are formed.

Last year one of the pleasant surprises the garden gave was the fine crop obtained from a twenty-five foot row of Early Valentine beans in September and October. During the drouth when the ground was baked so hard in the hard clay forming my soil that I had to chop out the furrow with the point of a potate-hoe I sowed my Early Valentines. After digging the

furrow, I watered it thoroughly, then put in the beans and covered them half the depth of the furrow, about two inches with earth, which I watered thoroughly again, and then filled up the rest of the furrow with dry earth. The plants came up in the usual time without further watering and bore a fine crop, assisted by the cheese-cloth screen, until well into October.

CANNING VEGETABLES FROM THE HOME GARDEN-SUPPLEMENTARY NOTES.

BLANCHARD HARPER, Madison, Wis.

(See Vol. XXXIX, p. 214.)

Everyone interested in the canning of vegetables as described in my notes in the Report for 1909, should procure from the Agricultural Dept. at Washington, Farmer's Free Bulletin No. 359, "Canning Vegetables in the Home." Naturally I prefer my own methods, but the bulletin contains so much that is valuable that every one interested in the subject should secure a copy.

One fact stated there solved for me a problem that had long puzzled me; namely that peas gathered from the same vines within a day of one another should taste so differently when canned. A farmer grew for me two bushels of "Advancer" peas picked them in the evening and drove six miles the next day to deliver them. They seemed in good condition. I canned some that day and the remainder the next. Those cans of peas kept perfectly—there was no sign of spoiling, but they were as flat and tasteless as sawdust. I find the explanation in the following statement the author of the bulletin Mr. J. I. Breazeale, makes in regard to corn, one which I believe holds true in regard to all sweet vegetables, and on which too much stress cannot be put. After stating that vegetables should be gathered fresh, if possible with the dew on them, and kept damp

of corn the amount of sugar diminishes very rapidly after the
WINTER MEETING.

ear is pulled from the stalk; therefore in order to retain the original sweetness and flavor it is necessary to can corn very soon after it is pulled, within an hour if possible." Incidentally I may add that for table use I have kept corn twenty-four or forty-eight hours with but slight loss of flavor, by laying each ear in the husks *directly on ice*, but not in any other way.

The following recipes are in use by several successful housewives and are contributed as affording a means of keeping corn when otherwise variously possible conditions would prevent canning.

Canned Corn. (Mrs. Frank Mac Connell.) A recipe very generally used. To 9 pints of fresh corn cut from the cob, add one pint of sugar, and one pint of salt (if the salt is very strong use $\frac{1}{2}$ pint), and three pints of water. Boil all together for five minutes and pack while hot in thoroughly sterilized jars. To serve soak in several changes of water to remove the salt; cook with a little cream until scalding hot.

Dried Corn, as made on the Turvill Farm, by Mrs. Elizabeth F. Wood. Gather tender fresh corn, boil it in water three minutes, drain and cool; then cut the grains from the cob, but not too close. Spread the kernals in a thin layer in a large pan and place in a cool oven, stirring and shaking from time to time to allow it to heat and dry evenly for several hours. The flavor seems better if the drying is not prolonged over a day. When dry store loosely in a paper bag kept in a dry place. To serve, soak over night in water, then simmer gently on the back of the stove for several hours, and add butter and cream before sending to the table.

Dried Corn as made by Mrs. Albert J. Lamson. Gather the corn when best for the table, score the kernals with a knife and press out the pulp, or use a "corn scorer." Take as many enameled pans or plates as required, grease them lightly with butter and spread the pulp thinly over the bottom of the plates, the layer should not be more than 1/4 inch thick. Place the pans in an oven not warm enough to burn or scoreh the corn, but warm enough to cook it, and allow them to remain until the corn thickens, so that it can be cut into wafers 3 inches square. Gently turn the wafers to allow the under side to finish drying in the now cooler oven, or finish the drying in any suitable warm dry place. Corn begun in the morning should be done

and cool until used, he says, when he speaks of corn, "that experiments * * * have proved that in the sweet varieties by night. To serve, soak the wafers a few minutes, and cook with salt, butter and cream.

WISCONSIN A FRUIT STATE.

(Read by G. W. REIGLE at the National Land Congress, Chicago, Nov. 15th, 1909.)

Nearly 54,000 square miles. If we were to pick up the state of Wisconsin and spread her over the states of Maine, New Hampshire, Vermont and Massachusets there would be left uncovered just enough foreign cranberry-bog to bury without ceremony and without a tear the entire Minnesota foot-ball aggregation.

Wisconsin follows the fashion of the north in persisting to elect republican governors and emphatically proclaims J. O. Davidson the most democratic executive she ever had.

Her senators are known from ocean to ocean each occupying pedestals coveted by many anxious friends of the people; one is accused of having amassed a million but totally lacking in the ability to spend it, according to the moral standard set up by his critics; the other is charged with unprofessional irregularities in politics, often calls the roll, meets all gradiators, bunched, in the political arena and the latest advices report him very much alive.

Wisconsin has the greatest University in the west, her cities are annexing farm lands in every direction to accommodate their amazing growth; her farmers are becoming rich and her thousands of undeveloped acres are rapidly becoming the dwelling place of properous and happy immigrants.

Is Wisconsin on the map commercially? Let us see! Chicago lies just off the south-east corner, Milwaukee and other large cities near by. Duluth, Superior, St. Paul and Minneapolis nestle at the corner diagonally across the state. Shall I say that Kansas City and St. Louis are near the south-west corner? Some loyal Badger must say, yes; and also that trade routes by

WINTER MEETING.

rail and by water with each of these centers are so common and so numerous that they no longer create comment nor surprise. "Where is this state?" did I hear you say? Just take a map and find the state whose contour resembles an old righthand buck-skin mitten and you have it; a state in every way worthy of the most enthusiastic commendation.

Regarding the rank Wisconsin holds in the gross production of fruits an honest estimate will place her below Michigan and New York. However the possibilities of making Wisconsin a fruit state of first rank is not only predicted by many of our formost fruit men; but is actually believed by many long-headed business men who today are investing in land they consider to be suitable for orcharding.

The influences, not insurmountable by any means, which to the writer seem most antagonistic to apple raising in particular are: First, the length of the time required to establish an orchard before returns may be expected, Second, the technical skill and experience necessary to control successfully the injurious insects and fungi, and Third, the difficulty of receiving renumerative prices during periods of extraordinary production.

Notwithstanding all these handicaps and the over shadowing dairy industry there are several counties where the success of commercial orcharding has been demonstrated as satisfactorily as a proposition in geometry. These counties embrace Kewaunee and Door with Sturgeon Bay as a center, Marathon in which at Wausau is located our best trial orchard. Other counties especially noted for excellent crops of apples are Winnebago, Manitowoc, Sauk, Richland, Crawford, Monroe, Eau Claire and Chippewa. These sections have orchards of bearing trees from seven years old to seventy, the acreage in one instance reaching as high as sixty acres. In proof of what has been said above Secretary F. Cranefield of the Wisconsin State Horticultural Society has kindly furnished me with the following data: There are eight acres of apple trees in the Wausau trial orchard established in 1897 by the Wisconsin State Horticultural Society. When the Wausau orchard was 10 years old, sixteen hundred bushels of salable apples were harvested and this year (1909) twenty-two hundred bushels of apples by measure have been reported.

Near Chippewa Falls, this year, Mr. James Melville harvested over sixteen hundred bushels of Wealthys, about five hundred

bushels of Oldenburg, and two hundred bushels of varieties mixed. The Wealthys were allowed to ripen fully and fall to the ground; afterwards they were gathered in "gunny" sacks, loaded on a hay-rack and sold for one dollar per bushel in local markets. Mr. Andrew Moholt, Eau Claire, has a forty acre orchard, one-half now yielding him handsome returns.

Mr. Palmer, Sauk Co., reports a crop from a three-acre orchard of Wealthys and some other varieties selling for fifteen hundred dollars and the average yield for a term of years netted him between three hundred dollars and five hundred dollars each year.

Mr. John Reis, Richland Co., writes "I have sold 675 barrels from a twelve acre orchard for eighteen hundred dollars net. My most profitable seller is the McMahan."

Door and Kewaunee Counties had a surplus this year of 20,000 barrels. The surplus for the state at large is estimated at 65,000 barrels.

My observation establishes these facts: 1st, That the best site for an orchard is on the elevated fertile limestone ridges. 2nd, That certain hardy fall apples should be chosen for planting. 3rd, That the commercial orchard cannot be conducted as a side line. 4th, That Wisconsin is each year producing apples superior in quality, and just as handsome as any other state in the Union.

You have heard of the apparently sensational reports from northern Wisconsin exploiting the sour cherry industry and the nominal cost of land on which they may be grown. Allow me to submit reports made by well known business men who live in Sturgeon Bay. This year Mr. A. L. Hatch received four thousand fifty-eight dollars and thirty-five cents from seven hundred 12 year old trees occupying 8 acres. Last year, 1908, he sold the crop from the same trees for \$3,200.00 (\$400.00 per acre).

Mr. Lawrence's crop from 600 twelve year old cherry trees this year sold for \$3,966.00 (\$500.00 per acre).

Mr. D. E. Bingham writes: (I quote from our last report.) "The gross receipts from eight acres of cherries for six years beginning the fourth year after planting was \$10,700.00 or an average of \$1,783.00 per year for the fruiting period of the orchard or \$1,075.00 per year for ten years, the whole time since the orchard was planted."

The strawberry and bush fruits are grown with ease and profit anywhere in the state, the profit of course will vary as distances from good local markets vary, and where shipments are necessary much will depend upon rapid transit faculties and the organization of the fruit growers.

Sparta and Eau Claire are very important strawberry and bush fruit centers. The Sparta acreage of the strawberry will approximate 500 acres together with an additional 100 acres covered with the raspberry and the blackberry, etc.

Seventy-two thousand dollars worth of small fruit were shipped from the Sparta station this year.

Hon. C. H. Daub, Eau Claire, believes that more small fruits are now shipped out of Eau Claire than out of Sparta. (No accurate data however is available.)

Strawberries, raspberries and blackberries when grown near a market like Madison, Wis., or shipped by an association organized as well as the Sparta association will yield a profit of from \$500.00 to \$800.00 per acre. The Americana plum and the early varieties of the Concord type of grape have proven very profitable also when grown by a specialist. But I weary of these dollars and cents details in fruit raising though they are vitally important to those who would engage in this business.

This brief and hastily written paper would lack its most essential feature should no reference be made to the organization and the old Patriarchs in Israel who have fostered and stimulated this industry. The Wisconsin State Horticultural Society now has a membership of about one thousand members which fact should indicate a growing interest in horticulture.

This Society is maintained by a liberal annual appropriation from the state treasury. This money is disbursed by an executive board which is elected by ballot from the membership of the Society.

The Society has assumed a variety of activities; viz.,

1st. The establishment of trial orchards and vineyards for testing the different varieties of fruit and vines; the testing of soils, climate, conditions and drainage.

2nd, Demonstration orchards.

3rd, Renewal of old orchards.

4th, Beautifying of the grounds of the common district schools (new work).

5th, Conducting a correspondence school, through which helpful answers to all questions bearing on horticulture are sent without cost to every enquirer. This department is conducted almost wholly by Mr. Cranefield, our secretary.

Besides the information bureau referred to the society issues each year four bulletins on vital horticultural subjects.

Our annual report is a compact, illustrated bound volume containing an entire year's transactions of the Society. The president for this year is William Toole, Baraboo; the Secretary, Frederic Cranefield, Madison, Wis.

A notable feature of the societies attractions for many years has been two exhibitions yearly of fruits and flowers (not grown under glass) in competition for generous premiums.

Every since the trial orchards have begun to produce fruit the society has displayed samples of the products of these trial orchards at the Wisconsin State Fair, an attendant being present at all times to answer questions and to volunteer expert advice to prospective planters.

This year, 1909, instead of the fruit display at the State Fair the society assembled a spectacular display of spraying machinery and their accessories, ranging in size from the tiny hand bulb spray to the immense power sprayers suitable for the largest orchards. As a part of the same display certain well-known manufacturers of chemicals were invited to exhibit poisons which are necessary to combat successfully the numerous insect pests and fungi of plants, vines and trees. Some of these companies placed skillful chemists in charge who demonstrated the chemists method and the ordinary method of compounding spray mixtures for orchards and other plant life. This display I regard as the most opportune action of the society for many years.

In conclusion I maintain:

1st, That Wisconsin is the hub of the commercial wheel in the United States.

2nd, That Wisconsin soil, climate and rain fall; the anglosaxon predominancy of its people; its thousands of acres of cheap arable lands are of themselves inducements for capital and labor, not duplicated on this continent.

3rd, That Wisconsin orchardists do grow apples which for size, beauty and quality have won gold and silver medals and grand prizes whenever they have been placed in competition at World's Fairs.

4th, That Wisconsin now has a strong conservative organization made up of wealthy business men and earnest thorough-

WINTER MEETING.

going practical fruit growers whose united efforts must result in winning for Wisconsin three jewels of inestimable value to humanity.

Wisconsin First in apples!

Wisconsin First in cherries!!

Wisconsin First in the luscious strawberry!!! November 15, 1909..

REPORT OF THE EAU CLAIRE FRUIT GROWERS' AS-SOCIATION.

The Eau Claire Fruit Growers' Ass'n. was organized in 1902 and has held monthly meetings from that date. The year 1909 has been the most successful year we have had although we had a short crop.

As an association we are working together and improving our ways of marketing our fruit, improving our Laws and By-laws and 1910 finds us in a flourishing condition with money in the Treasury and a good feeling among our members.

We have 102 members in good standing. We marketed about 15,000 cases of strawberries in 1909, and there was about the same amount shipped by private growers.

Duluth is our market and we have ideal shipping facilities. The car is closed at 5 o'clock and the retail trade, in Duluth, can have them at 7 o'clock next morning as fresh as if they had picked them out of their own garden.

The association at present handles strawberries only but we expect to handle raspberries and blackberries the coming season.

Eau Claire County is coming to the front in raising small fruits and the acreage is increasing fast. We are also producing lots of apples and plums and new orchards are being set out and old ones enlarged and we are advancing slow but sure.

The strawberry crop for 1910 looked most promising when they were mulched in the fall and most all growers had a nice stand of plants in spite of our dry summer.

15-H. S.

BAYFIELD, WIS., Jan. 15, 1910.

To the Wisconsin State Horticultural Society:

Madison, Wisconsin.

In the last four years the Bayfield Peninsula has made wonderful progress in the fruit industry. Prior to that time there were no commercial orchards or commercial advancement in the small fruit line. Our citizens had made no effort in that direction and had given it no thought, and most of them thought that fruit as a commercial enterprise for this section would be a failure. They were governed too much by the opinion of our neighbors south of us; "too far North" was the ery. Notwithstanding, they themselves had been growing all varities of small fruit for home use, and some varities of apples and cherries for thirty years, and their success in this small way never prompted them to try it commercially. A few citizens finally did wake up to this suggestive object lesson and began to set out trees and small fruit and to talk fruit to their fellow citizens. Of course some laughed in your face, some pitied you for the money you were squandering, and some listened to you and talked it over with you inquiringly, and then went home and talked over the truths you had brought to their notice, and finally began to set out trees and small fruit, and were successful in their efforts. This success of some made the others take notice and brought them to realize what had been done, and they began to absorb the fruit venture and began the work of fruit growing themselves, and to-day you can scarcely find a knocker in our district. They have all been taught to believe in the future of this district as a fruit country commercially. We have organized a Horticultural Society of about one hundred members, and through the society, much educational work has been done, and many beginners are on the road to growing fruit for the market. In the last three years our district has put out about twenty-five thousand apple trees, and twenty thousand cherry trees. There were two cars of cherry trees brought to Bayfield this fall, containing 17,000 trees. There were also several thousand apple trees brought in for planting next spring. Men are coming in with the expectation of growing fruit, and are clearing up land for that purpose. We would move forward faster were it not for the fact that our land

226

WINTER MEETING.

is all stump or timber land, and has to be cleared before they can plant trees or small fruit. Cleared land cannot be bought at any price, as about all the cleared land is owned by men who are in the fruit business or expect to engage in it, or have cleared the land for that purpose. There will be over one hundred acres of strawberries to pick this year. Some are setting out blackberries, raspberries, and currants commercially, but these fruits are not in bearing. This year there will be but little of this fruit for sale outside of home markets. All of our small fruit and cherries have been thoroughly tested out and can be no failure in the growing.

As to apples, outside of the Duchess, Yellow Transparent, Wealthy, and Crabs, other varieties (many of them), have been planted, and the trees are growing fine, and in a few years will be tested far enough to know what varieties to grow in our district. A few trees were in bearing this year of the following varieties not before tested: The Patten Greening and Dudley. These trees bore remarkably fine fruit and attracted much attention from the fruit growers. Take it all through, the fruit industry on the Bayfield Peninsula looks very promising.

WM. KNIGHT.

Delegate from Bayfield, Wis.



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MADISON, WIS. Democrat Printing Company, State Printer 1910

NOTICE TO MEMBERS

The 1910 Annual Report is issued in two parts. An edition of fifteen hundred copies of Part I has been issued and copies will be sent only to members.

Part II contains the transactions of the two conventions and other matters of general interest.

> FREDERIC CRANEFIELD, Editor.

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. Life members shall pay a fee of five dollars for such membership. Annual members shall pay an annual fee of 50 cents, except paid members of local horticultural societies who shall pay an annual fee of 25 cents for such membership; wives of such members shall be entitled to the privileges of full membership.

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 horticulture 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 and an Executive Committee, consisting of the foregoing officers and one additional member from each congressional district, 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 elect d. 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.

The Treasurer 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 money and property of the Society in his hands or under his control; which bond when approved shall be filed with the Secretary.

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

Article 7. The members of the Executive Committee from the several congressional districts shall be chosen by the delegates of their respective county or local societies present at the annual meeting of this Society, or in case of the absence of delegates from such societies or in case of failure to elect, such members shall be chosen from among the members of this Society present from such districts. But if any district is not represented the vacancy shall be filled by vote of the members of this Society present at the annual meeting.

Article 8. The term "county and local horticultural societies" shall include any organization that shall have for its object the advancement of the interests of its members in the growing or sale of horticultural crops; provided that such society acts by authority of a regularly adopted constitution and makes an annual report to the Secretary of the state society.

Article 9. 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 10. Only persons holding memberships according to the regulations of the Society shall be members of it.

Article 11. This Constitution, with the accompanying by-laws, may be amended, at any regular meeting of this Seciety by a two-thirds vote of the members present; provided that such amendment is presented in writing.

RULES AND BY-LAWS

Article I.-Membership.

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

Article II.-Meetings.

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

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

Article III.-Duties of Officers-The President.

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

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

Sec. 3. He shall sign all orders drawn on the Treasurer for the payment of bills, accounts and claims audited by the Board of Managers and none other.

Sec. 4. In case of the absence from any cause of both the President and Vice President the members present, if a quorum, shall elect one of their number temporary president.

Article IV.-The Secretary.

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

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

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

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

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

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

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

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

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

Sec. 10. He shall receive all fees for membership, give proper receipts for the same, and unless otherwise directed by the Executive Committee, shall pay the money to the Treasurer, taking his receipts therefor.

Article V. The Treasurer.

Sec. 1. The Treasurer shall, before entering on 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. 2 He shall receive and be responsible for the safe keeping of all money, notes, securities, credits, etc., of any and every nature, belonging to the Society which shall come into his hands.

Sec. 3. 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

6

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. 4. 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 Secretary with a copy of the same on or before the first day of the Annual meeting.

Article VI. The Executive Committee.

Sec. 1. The Excutive Cammittee 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 members.

Sec. 3. They shall fix the amount of the Treasurers' bond, the number of his sureties and approve the same. They may require any other officer, agent or employee 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 employee 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 may 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 VII. Committees.

Sec. 1. The President, Treasurer 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 bimonthly to audit accounts and transact other business; special meetings may be called by any member of the Board.

7

Sec. 3. The President shall annually appoint the following standing committees-

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

Sec. 4. It shall be the duty of the Finance Committee to settle with the Treasurer and to examine and repor 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 VIII.-Miscellaneous.

8

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

TREASURER'S REPORT

(Presented at Annual Convention Madison, Jan. 26th, 1910) The fiscal year of the Society begins July 1st.

L. G. KELLOGG, Treasurer

In account with

THE WISCONSIN STATE HORTICULTURAL SOCIETY.

		Dr.	Cr.
1908 June 31 July 15	To balance due Society To state appropriation To interest on balances	\$10 58 8,000 00 56 70	
1909 July 1	By vouchers returned To balance due Treasurer		\$8,074 68
		\$8,074 68	\$8,074 68

REPORT OF FINANCE COMMITTEE

Madison, Wis., Jan 19, 1910.

To the Officers and Members of the W. S. H. S.:

We, the undersigned committee appointed to examine the books and accounts of the Wisconsin State Horticultural Society, hereby certify that we have examined the books of the treasurer of said Society and compared the same with the Secretary's records and with the orders issued and paid, extending from order No. 351 of July 10, 1908, to June 31, 1909, inclusive. We find said Treasurer's accounts are correct and they agree with the Secretary's for the period named.

FRAKLIN JOHNSON, W. S. HAGER, W. P. BUSSEY, Finance Committee.

FINANCIAL REPORT OF SECRETARY

(The accounts of the secretary are audited annually by the Finance Committee at the Annual Convention and cover the period between Conventions, in this case from Jan. 12th, 1909: to Jan. 25th, 1910.)

F. CRANEFIELD, Secretary

In account with

THE WISCONSIN STATE HORTICULTURAL SOCIETY

		Dr.	Cr.
1909			
Jan. 12	To balance due Society	\$129 13	
Jan. 15	Fruit sold at Convention	4 20	
Mch. 15	Bulletins sold	6 75	
	Books sold	16 05	
	Cards sold to County Fairs.	17 49	
	Refund from Bowker Insecticide Co	11 00	
	" Morrill & Morley	5 35	
	" " Wm Stahl Co	5 35	
	" " Niagara Gas Spraver Co	1 05	
	" " The Deming Co	5 40	
	" " The E C Brown Co	4 35	
	" " Field Force Pump Co	5 35	
	" " G W Reigle	1 00	
	" " Ill Central Ry Co	67	
Nov 8	Fruit sold Wansan Orchard	700 00	
	" " Sturgeon Bay Orchard	426 60	
Meh 93	Order No 580 for expenses	200 00	
Inly 10	645 " B45	100 00	
Ang 7	······································	100 00	
Sont 3		100 00	
Sept. 5		95 00	
Sept. II	Miscollanoous	1 20	
	Mambambin food	414 64	
Nov 9	Degramenta to treasure	114 04	2002 20
NOV. 0	rayments to treasurer	•••••	027 00
	To expenses	•••••	1 072 20
	To balance	•••••	1,070 20
		\$2,280 68	\$2,280 68

Madison, Wis., Jan. 19, 1910.

We have examined above accounts, extending from Jan. 12th, 1909, to Jan. 14th, 1910, and find same correct; there being a balance of \$1,076.20 due the Society which has been satisfied by Secretary F. Cranefield as follows:

Certificate of deposit, 1st National Bank, \$900.00 Certified check \$176.20.

FRANKLIN JOHNSON, W. S. HAGER, W. P. BUSSEY, Finance Committee. W. S. H. S.

FINANCIAL STATEMENT

Showing approximately how the funds of the Society were expended from July 1st, 1908, to July 1st, 1909. A list of the separate items, several hundred in number, has been filed in the Executive office, State Capitol, as required by law. A copy will be furnished any member, for examination, on application to the Secretary.

Trial orchards, including salary (\$1,000) and expenses of Supt.,

trees, labor, rent, inspection, etc	\$4,477	35
Printing	457	17
Postage	144	22
Summer Meeting	468	43
Winter Meeting	800	57
Salary Secretary	325	00
Expenses Secretary's Office	200	00
School Grounds	321	97
County Fairs (per diem of expert judges)	349	42
Board of Managers	90	39
State Fair Exhibit	69	34
Farm Institutes	230	00
Miscellaneous	140	82

\$8,074 68

PROCEEDINGS OF THE EXECUTIVE COMMITTEE

The general Executive Committee meets twice each year, at the summer meeting and during the Annual Convention. Omitting unimportant details, motions and resolutions the proceedings of the meetings during the past year follow:

LA CROSSE MEETING AUG. 24th, 1909

(1) Secretary authorized to employ stenographer regularly at \$35.00 a month.

(2) Two Institute lecturers to be furnished if suitable arrangements can be made with Farm Institute Board.

MADISON MEETING JAN. 17th, 1910

(1) The Secretary read revised premium list and rules for exhibitions at Summer meetings as prepared by Jas. Livingston of Lake Geneva, judge of flowers at La Crosse Meeting, and same were adopted as read, for 1910 Summer meeting.

(2) No premiums to be awarded for fruit except for varieties named in premium list either at Summer or Winter exhibitions.

(3) President to appoint committee of three to revise premium lists.

(4) That Secretary be instructed in making out financial statements to report salary of Secretary as \$500 and that of Supt. of Trial Orchards as \$1000.

(5) That school grounds work for coming year be left to Board of Managers.

(6) That in future no expenses be allowed delegates from local Societies.

(7) President and Treasurer be each allowed \$3.00 per day for time expended in interests of Society not exceeding 25 days in one year.

MEETING OF NEWLY ELECTED COMMITTEE THURSDAY, JAN. 20th, 1910.

(1) Frederic Cranefield appointed Secretary for coming year.

(2) Action of Executive Committee Monday evening, Jan. 17th, relating to expenses of delegates from local Societies revoked.

(3) The President appointed D. E. Bingham, L. G. Kellogg and the Secretary as a committee to investigate possibilities and feasibility of an extensive apple show November next.

12

MEMBERSHIP ROLL

WISCONSIN STATE HORTICULTURAL SOCIETY

LIFE MEMBERS

Allis, Frank W	Gonzenbach, ErnestSheboygan Guilford, W. SPecatonica Ill.
Andrus, Dr. A. PAshland	Guttman, A Manitowoc
Auer, Mrs. LouisMilwaukee	West Deser
Ayer, Ed. EFontana	Hager, W. S West Depere
	Hanchett, W. HSparta
Babcock, Chas. L Milwaukee	Harden, F. A Weyauwega
Babcock, O. WOmro	Harland, F. WMilwaukee
Baker, Dr. B. F Milwaukee	Harris, N. WLake Geneva
Barnes, A. DWaupaca	Hatch, A. L Sturgeon Bay
Bingham, D. ESturgeon Bay	Henrichs, ErnestReedsburg
Bingham, R. O Sturgeon Bay	Henry, M, EOshkosh
Brown, F. G Madison	Herbst, J. LSparta
Browne, PaulRhinelander	Hildemann, E. SBelleplain
Bruning, JacobShermerville, Ill.	Hudnall, Geo. BSuperior
Buckstaff, D. COshkosh	Hutchins, F. AMadison
Buehler, J. GRichland Center	Hutchinson, C. LLake Geneva
Burnham, O. JRichland Center	
Bussev. W. POmro	Jacob, Nick CSawyer
	Jewett, A. JSparta
Carpenter, L. AFond du Lac	Johnson, Chas. GWelcome
Carver, N. EBayfield	Johnson, FranklinBaraboo
Cashman, Thos. E. Owatonna, Minn.	Jones, G. DWausau
Chandler, S. S., JrWaupaca	Jones, John D Elk Grove
Chapin, S. BLake Geneva	Joys, A. MMilwaukee
Chenev. L. SBarron	
Cleermans, AugGreen Bay	Kellogg, L. GRipon
Coe, R. J	Kellogg, M. SJanesville
Cole, W. BPleasant Prairie	Kierstead, E. HLake View, Mich.
Converse, D. CFt. Atkinson	Knight, WmBayfield
Copeland, Dr. ErnestMilwaukee	Koehler, JohnNorth Milwaukee
	Kremers, E Madison
Dunn Co. School of Agr. &	Kreutzer, A. LWausau
Domestic EconomyMenomonie	Krienetz, Alfred J Milwaukee
Eaton, B. ASouth Milwaukee	La Follette, Robt. M Madison
Edwards, F. C Ft. Atkinson	Larkin, D. WSturgeon Bay
	Larson, W. E Manitowoc
Fancher, W. ECorliss	Lathrop, Stanley E Ashland
Fiebing, J. H	Lawrence, A. W. Jr. Sturgeon Bay
Fieldhouse Wm Dodgeville	Lillesand, L. ECambridge
Foley M F	Loeffel, W. L Chicago, Ill.
France N E	Loop, A. INorth East, Penn.
Freeman, G. A	Loope, Dr. T. E Eureka
Freeman, Boy F Racine	Loveland, T. A., Minneapolis, Minn.
,,,,	Lyon, Jay F Elkhorn
Gifford, G. P Madison	Magnussen, PederAugusta

LIFE MEMBERS—Continued

Malde, O. G Madison	Saxe, ArthurWhitewater
Marshall, S. HSimeon, Va.	Schomberg, O. H Milwaukee
Maxon, O. P Waukegan, Ill.	Schroeder, Mrs. F. J Milwaukee
Melcher, H. COconomowoc	Schuette, AugManitowoc
Melville, Jas. W Chippewa Falls	Seubert, John Cologne, Minn.
McGovern, Wm. PCedarburg	Simon, HBaraboo
McGregor, E. L Appleton	Simonson, Arthur, Racine
	Smith, A. J. Lake Geneva
Naffz, Henry ESauk City	Smith, Geo. B
Nelson, J. C	Smith Irving Ashland
Nienaber, B. H. Manitowood	Smith Silas S Crandon
ittenuoei, D. ittentitumuntowoo	Steele W H Powaukoo
Oleson Janes P Rinon	Storie, W. H Waakoo
Orr E D Mt Hope	Taylor Will L. Mt Hope
оп, в. рис. поре	Telfer C I Et Atkinson
Palmer I S Baraboo	Tifft Geo L. Milwankoo
Palmer L H Baraboo	Tilson Mrs Ida E. Wast Salam
Patterson Chas Franksville	Timlin W H Madison
Pack Chas G Sheboygan Falls	Tittemore I N Oshkosh
Pelton Montross Reedshurg	Toole W A Baraboo
Pirner John Waukesha	Toole Wm Baraboo
Plumb Wm H Madison	Tralavan Jos D Omro
Pollworth C C Milwaukoa	
1 onworth, O. C	Underwood I M "Lake City Minn
Randolph Harriat La Crossa	Underwood, S. M., Lake City, Minn.
Raymor Goo Madison	Unham Mrs H A I Milwaukoo
Rantschlar F Madison	opham, mis. n. smiwaukee
Richardson C. L. Stanlay	Van Dyke Geo D Milwaukee
Richardson F A Sports	Vanghn B Grand Banide
Richardson, E. A	vaugini, bGrand Rapids
Posepow H F Ocopomowoo	Wannay Ennest N Madison
Rosenow, H. E	Wahle W U Cupation
Duccel Hewland Milwayloo	Williams Daniel Ocenomous
Russel, Howland	Williams, Damen C. Shiesten
Ruste, C. O	Whight Arthur Wilmouloo
nyerson, M. A Lake Geneva	wright, Arthur
Colton Wolton N Coattle Wesh	Vanish E St Daul Minn
Salter, waiter NSeattle, Wash.	ramsn, ESt. Paul, Minn.
Salzer, John A La Crosse	

HONORARY LIFE MEMBERS

Bailey, Prof. L. H Ithaca, N. Y.	Periam, JonathanChicago, Ill
Hinckley, M. E Mt. Vernon, Ia.	Philips, A. J West Salem
Kellogg, Geo. JLake Mills	Phoenix F. H Delavan
Patten, C. G Charles City, Ia.	Trelease, Prof. WmSt. Louis, Mo.

ANNUAL HONORARY MEMBERS

L. R.	Bryant,	Princeton, Ill.	Pratt, Chas. A. Benton Harbor,	Mie	ch.
Cady,	Prof. LeRoy	St. Paul Minn.	Taylor, O. MGeneva,	N.	Y:
Erwin	n, Prof. R. A	Ames, Ia.	Wallace, ErrettIthaca,	N.	Υ.

ANNUAL MEMBERS

Abbott, WmFt. Atkinson	Allen, Chas. LEau Claire
Adams, Jas. AAlma Center	Allen, JasKnowlton
Adams, Lester BLowell	Allen, M. TWaupaca
Adams, W. SFall River	Amond, PhillipGillette
Adamson, Mrs. C. F Madison	Anaoker, BPortage

ANNUAL MEMBERS_Continued

Anderson, J. PAshland	Burg, E. FDuluth, Minn.
Anderson, OliverLarsen	Button, A. ASturgeon Bay
Anderson, PederPoysippi	Cairns W R · Madison
Arneson, HansWhitehall	Campbell A D Madison
Arnold, Arther AKiel	Canor H J Mondovi
Ascott, WmSparta	Cantwell F W Madison
Ashley, H. MChicago, Ill.	Carey C H Redgranite
Athearn, L. JOshkosh	Carey J E L Redgranite
Ayers, WAlbion	Carneross J E Okee
Aznoe, John Detroit Harbor	Carpenter Mary Madison
	Carter, Mrs. Eva
Backey, K. JSawyer	Case, Harry H. Cherry Valley Ill
Bagnall. R. TSturgeon Bay	Case, Walter, Rice Lake
Baker, H. J Fond du Lac	Chambers, O. Q Union Grove
Baldwin, Herbert Mountain	Cheek, A. P Baraboo
Bassett, Arthur KBaraboo	Cheeseman, F. W, Sturgeon Bay
Bathrick, D. D Chicago, III.	Christensen, A. HAlmond
Beauchene, M. L Chippewa Falls	Christensen, C. A. MWalsh
Beck, Peter CRacine	Clark, M. C Madison
Beckwith, Howard W Lake Geneva	Clark, W. TFt. Atkinson
Bender, C. HNorth Freedom	Clavton, Geo. H Madison
Bendixen, E. H Milwaukee	Clement, Eugene E., Temple, H. H.
Bennett, A. C Grand Rapids	Cochran, Mrs. J. WMadison
Bennett, H. J Cherry Valley, III.	Coldwell, JohnMazomanie
Bennett, wm. FOnicago, III.	Cole, VMountain
Berger, Ole H Chetek	Comstock, H. WMerrillan
Birmingham, AverySturgeon Day	Conant, Walter A Temple, N. H.
Birmingham, EugeneSturgeon Day	Conkle, ByronArlington
Block (' I) Independence Is	Cooke, W. DGreen Bay
Black, G. D Independence, 1a.	Cooley, E. J Easton
Plack, Henry C Dalaboo	Coon, Dr. J. WWales
Blackman, Henry D. Alemand Center	Cooper, G. NAshland
Plassing D S Harrishurg Da	Cooper, H. O Montello
Block Albert F Brandon	Cornish, O. BFt. Atkinson
Blumer Fred Monticello	Crawford, JohnOconto
Boerner A F Cedarburg	Crawford, MCuyahoga Falls, O.
Roesler E () Racine	Croley, W. EMilwaukee
Borgeson K Redgranite	Crossman, P. HBaraboo
Borst John Redgranite	Crowley, JohnSparta
Bosshard Emma La Crosse	Currie, JamesMilwaukee
Boucsein, G. L., Detroit Harbor	Curtis, Geo., JrMadison
Boudnik, John	Curliss, Mark WSalem
Boyles, C. C Lake Geneva	Dahle, John N
Brack, W. ERacine	Daly, Richard EWashburn
Bradford, Ira BAugusta	Daly, WmWashburn
Braen, MathiasAlma	Damkoehler, H. E Milwaukee
Brainerd, C. PBoscobel	Damkoehler, W. LMilwaukee
Breakey, G. MAlma Center	Daub, C. HEau Claire
Bridge, H. HLake Mills	Davis, J. AHartland
Briggs, NewtonMadison	Dean, H. F Whitewater
Brigham, Chas. IBlue Mounds	DeGreef, JosGreen Bay
Brodt, S. FPatch Grove	Delwiche, EdAshland
Brooks, Edward J Watertown	Detjen, L. RAlgoma
Brown, A. DBaraboo	Dettinger, Wm FHixton
Brown, A. DPoplar	Dettwiler, John Monroe
Brown, C. LGlen Ellyn, Ill.	Dernitz, Henry CGrand Rapids
Brown, Dr. Geo. V. I Milwaukee	Derrwaldt, FrankPlymouth
Brown, Rev. L. H. Cherry Valley, Ill.	Deuchart, Geo. LGreen Bay
Buckley, L. HAlma Center	Dey, Scott S Wyocena

ANNUAL MEMBERS-Continued

Dhooge, Frank HAshland	Gilley, AlbertStoughton
Dillon, W. EButternut	Girling, GeoChicago
Dodd, Dr. Jno. MAshland	Goedjen, Henry Manitowoc
Doerr, GeoMilwaukee	Goff, MoultonMadison
Doherty, E. G Maple	Goldfarb, S Baraboo
Donaldson, H. A Eau Claire	Gorski, MikeMilwaukee
Donnelly, G. W	Gower, Will,, Alma Center
Donnelly, Jas	Graase, Frank N Sturgeon Bay
Doty E. P. Janesville	Grant, B. H Monico
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Dreier Herman Cedarburg	Greene Mrs Howard Milwaukee
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sula Hort Soc St	Umlauft, R.	Cochran, Mrs. J. W.
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26

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27

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29

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