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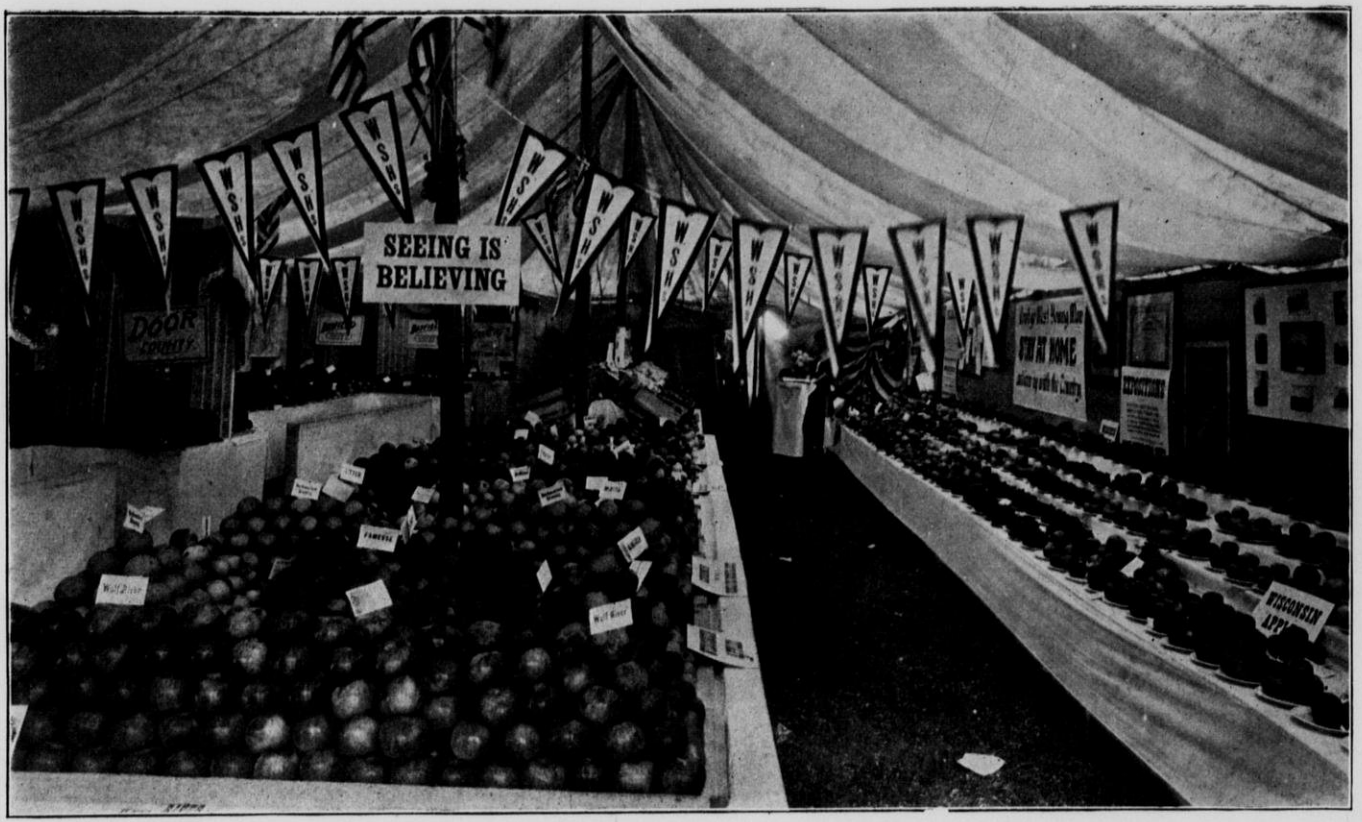

Portion of Society Exhibit at State Fair, Milwaukee, September, 1911.

ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year 1912

VOL. XLII

PART I.

F. CRANEFIELD, Editor.

MADISON, WIS.

MADISON

DEMOCRAT PRINTING COMPANY, STATE PRINTER

1912

LETTER OF TRANSMITTAL

MADISON, WIS., MARCH 1, 1912.

To His Excellency, FRANCIS E. MCGOVERN,

Governor of Wisconsin.

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

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

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OFFICERS.

D. E. Bingham, President.....Sturgeon Bay
C. L. Richardson, Vice President.....Stanley
L. G. Kellogg, Treasurer.....Ripon
F. Cranefield, Secretary .....Madison

EXECUTIVE COMMITTEE.

D. E. Bingham, Chairman.....*Ex-Officio*
C. L. Richardson .....*Ex-Officio*
L. G. Kellogg.....*Ex-Officio*
F. Cranefield .....*Ex-Officio*
1st Dist., Wm. P. Longland.....Lake Geneva
2nd Dist., G. W. Reigle.....Madison
3rd Dist., Wm. Toole .....Baraboo
4th Dist., W. C. Sieker .....Milwaukee
5th Dist., H. C. Melcher..... Oconomowoc
6th Dist., E. Gonzenbach.....Sheboygan
7th Dist., F. Muehlenkamp.....Sparta
8th Dist., N. A. Rasmussen.....Oshkosh
9th Dist., A. W. Lawrence, Jr.....Sturgeon Bay
10th Dist., Irving Smith.....Ashland
11th Dist., O. Flanders.....Bayfield

BOARD OF MANAGERS.

D. E. Bingham L. G. Kellogg F. Cranefield

COMMITTEE ON TRIAL ORCHARDS.

N. A. Rasmussen, term expires.....Jan. 1915
A. W. Lawrence, term expires.....Jan. 1914
J. S. Palmer, term expires.....Jan. 1913

LOCATION OF TRIAL AND DEMONSTRATION ORCHARDS.

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

The Improvement of Rural School Grounds.

Dist. No. 6. Town of Baraboo, Sauk Co.
Dist. No. 5. Town of South Lancaster, Grant Co.
Dist. No. 10. Town of Manitowoc Rapids, Manitowoc Co.
Dist. No. 3. Town of Sevastopol, Door Co.
Dist. No. 2. Town of Fond du Lac, Fond du Lac Co.
Dist. No. 1. Town of Genesee, Waukesha Co.

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, Fall Orange, Fameuse (Snow), Golden Russett, Hibernal, Lowland Raspberry, Longfield, Lubsk Queen, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Oldenburg (Duchess), Patten Greening, Perry Russett, Plumb Cider, Scott, Tetofski, Talman (Sweet), Utter, Wealthy, Westfield (Seek-no-Further), Windsor, Wolf River, Yellow 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, Fallawater, Gano, King, Northern Spy, Pewaukee, Willow Twig, York Imperial, Bellflower.**

APPLES (Comercial 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.**

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.**

JAPAN 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.

BLACKBERRIES.

Briton (Ancient), Eldorado, Snyder.

STRAWBERRIES.

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

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

TWO VARIETIES STRAWBERRIES FOR FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

Black: **Conrath, Cumberland, Gregg, Older.**
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.

Anjou, Bartlett, Clairgeau, 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.

LIST OF SHRUBS RECOMMENDED.*

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

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

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, Russell's Cottage, Seven Sisters, Gem of the Prairies, Crimson Rambler, Dorothy Perkins.

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

Dwarf—2 to 6 Feet.

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

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

Common Name.	Scientific Name.
Bearberry	Arctostaphylos Uva-ursi
New Jersey Tea	Ceanothus Americanus
Button Bush	Cephalanthus occidentalis
Prince's Pine	Cimaphila umbellata
Round-leaved Dogwood	Comptonia aspleniflora
Red Osier Dogwood	Cornus stolinifera
Leatherwood (Wickopy)	Dirca palustris
Trailing Arbutus	Epigaea repens
Wahoo	Euonymus atropurpureus
St. John's Wort	Hypericum pyramidatum
Winterberry (Holly)	Ilex verticillata
Trailing Juniper	Juniperus procumbens
Sweet Gale	Myrica Gale
Ninebark	Physocarpos' opulifolia
Buckthorn	Rhamnus catharticus
Staghorn Sumac	Rhus Typhina
Smooth Sumac	Rhus Glabra
Dwarf Sumac	Rhus copallina
Wild Red Currant	Ribes Rubrum
Wild Black Currant	Ribes floridum
Wild Rose (tall)	Rosa lucida
Wild Rose (dwarf)	Rosa blanda
Purple-flowered Raspberry	Rubus odoratus
White-Flowered Raspberry	Rubus Nutkanus
Common Elder	Sambucus Canadensis
Scarlet Elder	Sambucus pubens
Snowberry	Symphoricarpus racemosus
Coral Berry	Symphoricarpus vulgaris
Ground Hemlock	Taxus baccata
Sheepberry	Viburnum lentago

Black Haw.....Viburnum dentatum
_____.....Viburnum acerifolium
Bush Cranberry.....Viburnum opulus
Prickly Ash.....Zantoxylum Americanum

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.

SPRING FLOWERING BULBS.

Tulips, Single dwarf; Duc van Tholl pink, scarlet, white.

Tulip medium; red Artus, yellow Chrysolora pink Cottage Maid.

Hyacinth single: pink Charles Dickens, white Baroness von Thuyll, blue Baron von Thuyll.

Narcissus (daffodil), Von Lion.

Crocus: Mixed.

Tulips and other Holland bulbs must be planted in September or October and bloom early in spring.

BLACK LIST

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

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

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

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 known poison used to destroy biting insects, as the apple worm, tent caterpillar, potato beetle, 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 ½ lb. of 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 2½ 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.

BORDEAUX MIXTURE.

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

Formula.

Copper sulphate..... .....4 lbs.
Fresh (unslaked) lime.....5 lbs.
Water .....50 gals.

Dissolve the copper sulphate 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. sulphate in 50 gals. water.

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

Then use the following formula:

Water ..... (approximately) 45 gals.
Sulphate Solution..... 2 gals.
Lime Solution.....2½ gals.

LIME SULPHUR COMPOUND.

Used to destroy San Jose Scale, Oyster Shell Bark Louse and other insects; also used as a substitute for Bordeaux Mixture.

Commercial Lime Sulphur.

Lime sulphur in commercial form is generally more desirable than the homemade product, particularly that made in Wisconsin since our lime does not generally contain a high percentage of Calcium. In fact commercial lime sulphur can be purchased for very little more than the cost of the ingredients which are used in the homemade wash. Prof. J. G. Sanders.

Homemade.

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

Formula.

Fresh (unslaked) lime.....15 lbs.
Flowers of Sulphur.....15 lbs.
Water .....50 gallons.

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.

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." (See also p. 129.)

SPRAY:

WHAT?	WHY?	HOW?	WHEN?			REMARKS
			1ST SPRAYING	2D SPRAYING	3D SPRAYING	
Apple	Scab	Bordeaux Mixture	Just before Blossoms 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 growing plants
Cherry and Plum	Mildew and Shot-hole fungus	Bordeaux Mixture 3—4—50	When leaves are about ½ grown	10 to 12 days later	10 to 12 days later	
Currant and Gooseberry.	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 applications at intervals 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

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 or 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 undertaken the task of improving the grounds of the 7,000 rural schools of the state. (See 1912 Arbor Day Annual.) 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 a monthly magazine Wisconsin Horticulture which is sent free to members.

WE ANSWER QUESTIONS.

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

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

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

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

D. E. BINGHAM,
President W. S. H. S.,
Sturgeon Bay.

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

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

SUMMER MEETING

Oshkosh, Wis., August 16, 1911.

AFTERNOON SESSION.

The meeting was called to order by President D. E. Bingham at 2 P. M.

The president introduced Mayor Banderob of Oshkosh, who spoke as follows:

ADDRESS OF WELCOME.

Ladies and Gentlemen of the Horticultural Society of the State: I am glad to meet you. The people of Oshkosh feel honored to have you once more in our midst, and in behalf of my fellow citizens, I bid you welcome.

The occupation of horticulture is of great importance to all. Horticulture and agriculture are of more benefit to mankind than any other thing. Your toil produces the food which is indeed the staff of life, supporting the toiling, struggling humanity who this very morning are requiring their daily bread, all looking to the horticulture and agriculture of the country for that daily bread, and the food of the animals depending upon them, a demand as great as their own. It is the daily duty of the tillers of the soil to satisfy this gigantic

appetite, to fill the mouths of these hungry millions, for if by any mishap the supply were cut off for a few days, the life of the country, human and brute, would be extinct. How nobly this great duty of yours has been and is performed! The horticultural supply of all kinds of vegetable food is abundant, and our tables will be well supplied with all kinds of berries. The agricultural products, according to reports, I understand, are about as follows: The wheat crop this year is 30,000,000 bushels; corn, 500,000,000; oats, 300,000,000; potatoes, 90,000,000; barley, 23,000,000; buckwheat, 3,000,000; hay, 12,000,000 tons; which indicate men and animals will not have to go hungry. I hope the young men of this and future generations will go out and take up land and supply people with more of the good things of this life. That is where we have made a mistake; there are too many people in the cities. If I had to do it over again, my life would be that of a farmer all my lifetime. You have the best occupation on the face of the earth.

In conclusion, I wish to congratulate the members of the Horticultural Society. Yours is a most happy, healthy and independent life. I wish to tender you my most fervent and best wishes, and hopes for your increasing prosperity and usefulness.

RESPONSE ON BEHALF OF THE SOCIETY.

By Mr. William Toole.

Mr. Mayor and People of Oshkosh: We are all glad of this occasion which brought us together and has given us an opportunity to receive a welcome from the people of Oshkosh as represented by their worthy mayor. We are glad to feel that the people of Oshkosh who received the members of this Society here before, liked us so well they asked us to come again.

As you are all aware, it is our custom to have our winter meetings for our more heavy work at Madison, in the summer going over the state, where we can do two things; do the most good to the people, and receive the most benefit from the people. We do not come here altogether as missionaries to you

people of Oshkosh, thinking that we will teach you so much horticulture, but that we will also receive from you information which will be carried on to other places. We like to come to places where we can see what is being done in the way of home adornment, and as we look back over the years to the pioneer work that we did in the line of horticulture, not only promoting what is esthetic in horticultural life, but also in promoting fruit growing and all other branches of horticulture, we realize that the world has become richer. The farmers have passed the heavy work of clearing their farms and can give more attention to the brighter part of life, and we feel greatly encouraged that year by year our society becomes more and more important in the activities which lead to life's betterment, and we are glad to think that our power for good is increasing, as well as the appreciation of what we can do. From what I have seen of your city and from what our brother members tell me of the city of Oshkosh, it is eminently a city of homes, and we can see with but little glancing around us that the people love beautiful surroundings and are doing much that is worthy of example. Therefore, I am glad to feel that we will go away from here, as we left Oconomowoc a year ago, feeling sure that we will be glad to come again.

We thank you, Mr. Mayor, and the people of Oshkosh, for the cordial welcome that we have received, and we are glad of this opportunity that we have to meet with you, and I hope when we go away that you will be glad that we have been here with you.

AMATEUR FLORAL DECORATIONS.

BY MR. WM. TOOLE, BARABOO, WIS.

To the true lover of flowers there is joy in sharing with others the pleasure to be derived from their beauty.

In the garden, in their natural form is to be found the greatest beauty of flowers, but fortunately they may be separated from where they grew and retain much of their beauty so that we may share with others the delight of their contemplation, in our homes, or elsewhere. Gathered in loose sprays or with

more formal arrangements of what we call boquets is the most useful manner of assembling flowers to show their beauty in a decorative way, or to enhance the enjoyment of some occasion.

The present tendency to group together separate kinds and even separate shades of color of one kind of flower is commendable and yet we desire change and variety, and we sometimes choose to have varying tones of color in our groups. Then it becomes necessary to consider harmony of colors. Most generally, though not always, we find that there is no decided shock to our sense of the fitness of association when grouping together the various colors of any one variety of flowers. Those who have made a scientific study of color harmony can tell us all about color complements and dissect the rainbow to illustrate their ideas. We need not burden our minds with set rules, nor must we be able to define the various distinctions between lavender, mauve, ecru, with the varying shades of lilac, bluish purple, and heliotrope, or the finer distinction of red, from pink and rose through carmine, magenta, solferino, cerise, crimson and scarlet, to know if we have placed together shades which seem to clash, like false notes in music. The one who cannot discern fitness of association in colors after careful comparison, will not be helped much by committing to memory set rules on color harmony.

It is accepted as orthodox in floral arrangement that we may make free use of white or green among other shades of color for contrast or an effect of finish, and yet it is often necessary to consider how the green shall be placed next our flowers. Pansies and many other flowers may nestle among foliage without loss of good effect, but try your asters, zinnias, dahlias, and many other varieties in various ways and it will be seen that the beauty of the flowers is most effective when kept above the foliage as Nature has provided.

It is generally the case that the foliage of any particular kind of flower is the most suitable accompaniment, but it is not always convenient to provide such, and the additional green is often unnecessary when the flowers are in vases. If the flowers are carried in the hand, or arranged in a spray, as at funerals, then of course some finish below the flowers is necessary in addition to the tying on of ribbon.

The professional florist makes provision for a supply of green foliage for use as occasion requires, either with boquets or designs. The strictly amateur flower grower is not likely to have a supply of smilax, the ornamental varieties of asparagus, or suitable ferns, therefore, use must be made of whatever material is to be had. For use as supplementary green, divided foliage is desirable. We may as a makeshift at times make use of the leaves of schizanthus, cosmos, aquilegias, rose geraniums, mountain fringe, and some of our native ferns with more suitable material if it is to be had. Immature foliage wilts easily, therefore that which is full grown should be used if detached from its branches. It should be placed in water in a cool place for several hours before being used in a bouquet or design. The one who is generous with flowers will be rewarded with more, because gathering of flowers prevents seed-bearing, thus inducing the plant to produce more. For house or other indoor decoration, perhaps no flowers are more satisfactory than the gladioli. They are so lasting through renewal, by succession of flowers until the last bud has expanded. Much satisfaction can be had from the gladiolus by growing a number of each shade in several choice kinds. Many kinds of flowers as for instance the snapdragon have to a considerable extent the quality of renewal through development of succeeding buds. Nearly all of our hardy perennials are suitable for cut flowers. and many of them will give a succession if the first flowers are used and the plants are kept well cultivated. The early varieties of cosmos are being improved and give very desirable flowers which are almost as durable as asters. Of course, all persons like the late cosmos when they chance to blossom before freezing. Perhaps it would really be the province of another paper to enumerate the leading varieties of flowers which are suitable for boquets. Sometimes it is desirable to make the most possible out of very few flowers, as for instance, a cluster of geraniums with rose geranium leaves or other greens. A goblet and saucedish give opportunity for a combination of flowers with the longer stemmed varieties above and short stemmed flowers like pansies, balsam, or alyssum in the flat dish below. When arranging flowers in platters or shallow dishes it is not always convenient to provide sand or moss as a supporting material. A few leaves and stems of plants—it may be clover

even—serve to keep the flowers above the water. A piece of wire netting can often be used to advantage as a support to the flowers in these flat arrangements. There is often occasion where the side boquet with its front view of flowers is most suitable. For such boquets it is well to use a flat frame for a backing to which the flowers may be held in place; with floral designs the professional florist has a great advantage over the amateur in possession of available material. And yet I have known of ladies who have shown wonderful ingenuity in combining moss and wire and twine as a base for beautiful creations in floral work. There are times when friendship leads us to desire to make some formal arrangement of flowers and with sphagnum moss, fine wire, tin-foil and toothpicks in hand it is possible to make pleasing combinations from material which could not be used in an ordinary boquet. Recently there was a funeral and the hot August weather found the greenhouse in the nearby city scant of flowers excepting a few early asters. Pansies, double petunias, sweet alyssum and a few early cosmos were arranged by a friend and something of beauty was produced which was a solace to the bereaved ones. There are times when pansies make such a generous growth of foliage that one may feel free to cut the spray from the plants. These, if arranged in flat bunches of five or six sprays to a bunch can be assembled together on the surface of a casket or table in the form of wreath, star, cross or other design. The same idea may be carried out with some other flowers.

In arranging baskets of flowers, do not have the flowers packed too solidly together, nor yet standing out singly as if stuck in sand. In baskets or designs do not forget that the green should be subordinate to the flowers and that some shades of pink flowers look better if kept away from than if bedded in green. The handle should be secondary to the basket and no matter what fashion may permit, the use of ribbon can be overdone, yet if used with taste ribbon gives a finish which is very satisfying to the eye. It is the fashion of some of the papers these days to rail at the custom of presenting flowers at funerals as a waste of money and materials, but I am glad to think that we may always have such opportunity to express our sympathy and regard in times of bereavement.

LILIES.

BY MR. A. J. SMITH, LAKE GENEVA.

This subject of bulbous plants is far-reaching and interesting, not only to the practical gardener but also to the amateur, as a great many of these varieties of bulbs are of very easy culture.

The family of Lilliums comprise some of the most beautiful flowers. We have in cultivation Lillium Auratum, the grandest of all the lilies. It is called the gold-banded lily of Japan —so named because it has a gold band running through the center of each petal. The power of its fragrance is marvellous. There are several types of the Auratum, such as Auratum Pictum and Vittum Rubrum, but I think the old Var which was discovered in Japan many years ago by Mr. Gold Veitch is preferable, because it is a stronger grower, you get larger spikes of bloom.

These bulbs should be planted as soon as you receive them in November. They should be planted in good rich soil, covering the bulb ten inches. They will flower the following July and August.

There are many of the Japan lily bulbs that do not arrive here until the ground is frozen and if you intend planting these bulbs in the fall, it is a good plan to prepare your beds and cover them with leaves or litter to keep the frost out.

Lillium Lancifolium or Speciosum varieties are great favorites by all that know them. Lancifolium Album pure white Roseum, light color spotted Rose, Lancifolium Melpomene, rich crimson. This variety is a stronger grower and has larger flowers than the other Speciosums. I like it better both inside and out than Roseum. These varieties, like Auratum, are natives of Japan, and should be planted as soon as the bulbs are received. Plant them in good rich soil, covering ten inches. Lillium Longiflorum Muliflorum, trumpet shaped flower, pure white, very fragrant, should be planted in October to flower the summer following. Lillium Candidum, the old English Lent Lily, the best bulbs of this variety, are grown in the north of France. Everyone knows this old garden lily with its long

racemes of pure white flowers, and its delightful fragrance, which cannot be surpassed by any other variety. Under proper conditions, these large spikes will average from six to eighteen blooms. I showed some spikes of bloom last spring of Candidum with seventeen flowers, nor were these from new bulbs; it was the second year flowering with me. This variety, like most lilies, should be planted ten inches below the surface; they get a natural protection during winter and summer. In winter they are shut in air-tight by the frozen crust, and in summer they do not dry out so soon. They need a good, rich soil; it is a good plan to fork in some well decayed cow manure in the spring as soon as the frost is out of the ground. Lillium Tigrinum and Lillium Tigrinum flore plena, both the single and double, known as the Tiger Lily. This old variety is a great acquisition in perennial borders or dotted amongst shrubbery. This variety is a strong grower and easily cultivated and makes a very showy effect with its large spikes of orange colored blossoms spotted black. This variety should not be forgotten at planting time.

Lillium Henyrii is a native of northern China; hardy, and resembling the speciosum type. On good soil it will grow six feet and produce five to eight flowers on a spike. The color is apricot yellow spotted brown. Lillium Hansonii is another variety that should not be overlooked, especially for its early blooming. It grows about three feet, with golden yellow flowers, and blooms in June. Lillium Brownii is another species which is not grown as much as it deserves, or as it used to be. Of course, there are good reasons why Brownii has to take a back seat, because of the increased production of Lillium Longiflorum and Giganteum. The odorless Brownii can not compete with these varieties. Although Brownii is a beautiful flower and as large as Giganteum, trumpet shaped, color pure white inside, and the outside purplish brown, easy to grow and perfectly hardy, the native lilies are the best for producing natural effects, also the family of the Japanese elegans type, for planting amongst shrubbery, or in the natural wild gardens, varieties such as Lillium Superbum, Canadense and Philadelphicum. These grow well in a moist soil and partial shade, and in such aspect as these I don't know any flowers that are more satisfactory.

I wish to say a word for cold storage lily bulbs. This is practically a new feature, that is to say, it has not become general, but is fast becoming so. The high prices of these bulbs has kept them from being distributed more generally. The most useful amongst these retarded bulbs is Lillium Speciosum and Giganteum for winter blooming. These bulbs require more careful treatment than the same variety grown in the summer. They have not the vitality; they do not make so much root. I find they want to be confined to the smallest pot possible in accordance with the size of your bulb. I use nothing larger than a five inch pot, and a good many in four inch pots. It takes a little over five months to flower the Speciosums after planting the bulb, that is to say, you may plant the bulb in the middle of July and have them in bloom at Christmas. The Giganteums are somewhat stronger and quicker to bring into bloom; it takes about three months from planting the bulb to flowering. If you want a succession of cut flowers during the winter, it is a good plan to use the same methods as you do with Lily of the Valley; plant for succession, one month apart, starting the first batch August 1. This will keep you all the winter in Lillium Giganteum.

Lillium Harrisii, the Bermuda lily; these newly imported bulbs will follow your Giganteums, beginning January 1. This beautiful lily is not so large in its individual bloom as Longiflorum, but when well grown produces more flowers on a spike. Harrisii can be brought into flower in a shorter time than Longiflorum, which makes it more valuable for that reason; the medium size bulbs are best for early forcing. It does certainly seem wonderful when we stop to think, what nature has done in producing a natural succession of different varieties to follow one another until their season is past; and then again the ingenuity of man in retarding some of these varieties in cold storage, to be produced in all their glory out of their natural season.

Mr. Toole: I should like to ask the speaker if the two lilies, Lillium Candidum and Lillium Longiflorum are sufficiently hardy so that an amateur may take them in hand and plant them successfully, keeping them year after year, without renewing the bulbs each year?

Mr. Longland: You had better get some every year. They will last about three years in good shape; if you put in a few

every year, of course, you will have enough to keep on with right along.

Mr. Toole: Have any of you had experience with hyacinths? How do you get them properly started for winter bloom?

Mr Longland: You need a good compost soil, with a little sand and sometimes a little moss to the top; use a 5 inch pot. Put them in the cellar to start.

ROSES.

BY MR. A. MARTINI, LAKE GENEVA.

Let me in a brief way touch on some of the most essential points: Soil, location, varieties, protection, pruning. As in the cultivation of other plants the questions of soil and location enter first into our minds. The former must be well drained to begin with, for roses will not stand wet feet for one thing. Avoid very sandy or mucky ground—a soil rather heavy will give best results. Try to prepare your new rose beds in the fall for spring planting. Dig deep and pulverize soil well, incorporate a liberal supply of barnyard manure and course ground bone with the soil, using about 1/6 part of the former and 25 pounds of the latter to 1 yard of soil. Full sun exposure is the best. Now as to what to plant: without going to extremes in the classification of roses, we must nevertheless make a distinction for general understanding and will divide into hybrids: Hybrid-Teas, Ramblers, Moss, Rugosa and Everblooming roses.

The hybrids are among the hardiest of strong, robust growth that produce one good crop of flowers early in June and some varieties will bloom sparingly during the rest of the season. There are very many, in fact hundreds of varieties, but one good white, two shades of pink, two shades of red, and one dark red should be found in every garden. Frau Karl Drushky, Baroness Rothschild, Wm. John Laing, Ulrich Brunner, John Hopper and Prince Camille de Rohan, can be well recommended under the colors mentioned. Many more there are, of equal worth it is true, but I would suggest to plant few varieties only and have a large amount of the few whatever

they may be, for if used as cut flowers you will make a finer display and show better taste in arranging by using a mass of one color only, be it roses, or with few exceptions (pansies, salpiglassis, leahiose, etc.) any other flower. In planting young roses, grafted stock is considered best, being hardier and stronger growing. Plant deep, the grafted part should be at least two inches *under* ground and not, as in fruit trees, *above* ground. Two feet apart each way is a good distance and—the best time to plant is April if your ground is in workable condition. Get dormant plants and prune back to 4 or 5 eyes, do not expose the roots to the drying winds or you'll give to the nursery man the blame that belongs to *yourself* when in a few months you only gather a bundle of *dry sticks* instead of the beautiful flowers. So much for Hybrids. In regard to the *Tea Roses* or Hybrid Teas more properly speaking, I wish to say that they should be planted more generally, being almost continuous bloomers from June until hard frost, they will handsomely reward you for special care given them. *Pink Maman Cachet, white Cachet* the fiery crimson, *Gruss an Teplitz,* white *Kaiserin Augusta Victoria,* and the shell pink *Killarney,* are among the best of this class. The fruit grower sacrifices quantity for quality by thinning his fruit, so does the gardener obtain quality by *disbudding,* he sacrifices several buds to obtain one or two choice flowers to the stem, and long stems are his aim as well as choice flowers. These Hybrids and Hybrid Teas we must protect during winter. After the ground is frozen to stay so, peg the canes down as close as you can get them and cover with dry leaves or stable litter about one foot in *solid* thickness, and do not remove this covering, no matter how nice and warm the month of *March* might be, do not uncover until about the first week in April and then it is best to uncover gradually to get the wood used to light and heat by degrees. Should some of your plants look black trim well down to the ground. They will most surely sprout from below ground. The others must be pruned to about 6 to 10 inches from the ground. As a rule the Hybrids are pruned sharper than the Teas.

Give your rose beds a light spading, working good manure and some bone meal into the soil and if the weather be favorable like this year you'll enjoy a wealth of bloom by the end of May and early in June. If you have discovered a new way to

attain results then pass it along to your neighbor; get him or her interested that they also may learn to enjoy the beauties of Nature. On the other hand, if you have failed do not become discouraged; try again. Do not cover nor uncover too early. Do not overdo fertilizing or neglect watering, and last but not least, look out for insects. And right here remember spraying; *spraying* for prevention more than for cure. The rose-leaf slug, a small green caterpillar that works on the underside of the leaves will soon skeletonize your rose foliage from the bottom up so it will ever be an eyesore all through the season. Use arsenate of lead—a 1/50 solution—and cover the whole plant. This is very effective for this pest as well as for green fly. Apply in as fine a spray as possible, and while the foliage will be discolored slightly it will prove of no harm to the plants. It will however burn partly opened flowers, therefore the necessity and benefit of *early* application. The rose beetle, a leather colored insect of the size of a "ladybird" and of very hard body, who disfigures permanently any rosebud that he starts to chew on, must be handpicked.

Your rose garden is not complete without one or more Ramblers for these make a beautiful sight when in bloom, whether single or double. They are well adapted for covering arches or trellises, or can be trained into fantastic shapes. Those that are perfectly hardy are the Crimson Rambler, Prairie Queen (light red change to deep pink), Dorothy Perkins (shell pink, extra large clusters), and Lady Gay (soft pink turning lighter). These are all double flowering. Some of the best single flowering ones are "Hiawatha" and "Newport Fairy" —large clusters of light pink and dark pink flowers with a white center. They should be covered during winter and only very light pruning given in the spring if the old canes were left on the plant. A better way is to cut out all of the old canes after the flowering period and leave four or five of the strongest new ones to take their place and no further pruning will be necessary.

Many types of roses are also well adapted for the landscape gardener and beautiful effects can be produced by massive plantings of Rugosa roses—those very hardy roses of Japan—that bloom all summer and are equally attractive in winter with their bright berries. And so we could go on mentioning

type after type not forgetting our own native varieties, as Rose Setigera that is equally well adapted for planting in masses in large shrubberies, and so are the old favorites—the moss roses—that must, however, be pruned rather hard every spring to give best results. There is the *Rosa Lermosa* or monthly rose, the *Clothilde Soupert,* and the *Baby Rambler,* that are so well adapted for planting narrow borders, and knowing that the list is far from complete to suit everyone's taste will close, wishing success to the planter of roses, assuring you that all the varieties mentioned are among the best that can be grown.

DISCUSSION.

Mr. Niles: We have been trying the Fairfield, but have not tried it long enough to say whether it is hardy or not.

A Member: How about the Rosa Rugosa?

Mr. Coe: The Rugosas are hardy enough so that they need practically no protection. By the way, they are among the finest roses we have, the foliage is fine, the flower, too, is fine, and in the early part of the winter the shrub is covered with a bright red berry. They can be pruned back to give them any shape you want. The name of it means rough-leaf rose, sometimes it is called the Japan rose. There are a number of hybrids here that are almost equally successful. They have one or two large double red flowers and they blossom all summer, just the same as the single one. They make a beautiful hedge.

A Member: I should like to ask the gentleman how far apart to plant them for hedges?

Mr. Coe: Plant them about two feet apart; they will come together and make a solid hedge in about two years.

Mrs. Howlett: Is there not more necessity for covering and uncovering here than in Lake Geneva? I think there is considerable difference in the cold between this locality and Lake Geneva.

Mr. Coe: Well, Oshkosh is not very far from Lake Geneva. Just one word of precaution about covering roses. Never cover them until it gets cold weather; never cover them so they will get wet. The main thing in covering roses is to keep

them dry. Covering with leaves is good practice, but put a little marsh hay over the leaves, so that they will shed the water. If they keep wet they are likely to rot. You can keep tea roses over winter by keeping them dry.

Mrs. Howlett: Would not the mice get into the covering of leaves and marsh hay?

Mr. Coe: Cover them late, cover them after the mice have made their nests elsewhere.

Mr Toole. Would you advise taking them down before?

Mr. Coe: Yes, that is all right; take them down, but do not cover them until the ground is frozen. Cover them two feet with dry leaves, then put some dirt over them and marsh hay.

Mrs. Howlett: I think Mr. Eben Rexford's directions for covering rose bushes are better than anything else I have ever used. He said, take sods about 8 inches broad, I don't remember just the dimensions, but probably a foot and a half long, and have them cut loose from the ground ready for covering the rose bushes just before it freezes up. Then bend them over, lay these sods onto the bush; it will not smother the bushes and it keeps them warm enough so that they do not freeze. I have used it and found it an excellent plan, and the mice do not get into it as they did into hay when I covered them with that.

A Member: Do you cover the roses up with the sod?

Mrs. Howlett: No, bend the bush over and hold it down with the sod, and then perhaps put a light covering of dirt over the bush. The mice will not work in dirt as they will in litter.

Mr. Toole: I have had success in covering roses with garden soil. I would urge this precaution in bending the rose down: do not bend too abruptly as they may snap off. For that reason I often lay a shovelful of soil up against the bush, to prevent breaking in turning over. I have had roses that were in beautiful order above and below the bend, but killed right at the bend, because the soil had washed away and left them exposed at that point.

Mr. Niles: The old-fashioned June roses are among the most satisfactory, as they are good bloomers and perfectly hardy, but they bloom only during June.

FLOWERS FOR THE FARMER.

BY MRS. MARCIA HOWLETT.

When buying a farm ninety-nine out of a hundred purchasers would select, all other things being equal, the farm that was adorned with trees, shrubs and flowers. Why? Because apart from any sentimental reason, they instinctively recognize the increased money value of the one over the other.

One has more respect for himself and his calling if his home grounds are well kept and beautiful. The Good Book says "To him that hath shall be given," and he commands more respect from others also, for well kept grounds proclaim thrift and prosperity to every passer-by, and all right minded people wish to be considered thriving and prosperous.

We need not set lessons or expensive books to teach us how to adorn our homes, the great book of nature is wide open for all to read, and it is filled with many beautiful illustrations of the artistic blending of trees, shrubs and profusion of bloom.

The Thorn Apple, Wild Crab, Wahoo, Haw, Elder and Wild Rose are native blooming trees and shrubs that would enrich any landscape. The Sumac, Scarlet Maple and Virginia Creeper, with their gorgeous autumn coloring are as beautiful as flowers.

Our native climbers, Bitter-sweet, Wild Cucumber, Honey Suckle, Wild Grape, Wild Morning Glory and Clematis, if given a chance will cover all unsightly spots and harsh outlines, with a living, ever changing, swaying mantle of green, or twining their graceful vines and clinging tendrils into a leafy canopy of bud and bloom, they quickly transform a barren spot into a bower of beauty.

Hardy bulbs and Herbaceous Perennials, that will live year after year in a permanent border and furnish a succession of bloom from Spring to Fall, even with a little neglect, are Butter-cups, Tulips, Peony, Day Lilies, Lychnis, Columbines, Daisies, Hollyhocks, Digitalis, Larkspur, and Phlox.

Hardy shrubs that are easily cared for are Sweet Briar, Syringa, Snow Ball, Lilac, Spirea and hardy roses.

The easiest way to raise annuals for cutting is to place them in rows in the vegetable garden. Except for a little hand weeding in the row, all cultivating may be done with a horse if care is taken not to bury the tiny seedlings. The following varieties have proved good: Pansy, Pinks, Cosmos, Verbena, Poppy, Zinnia, Sweet Peas and Phlox. All of these are as easily raised as lettuce or onions.

Why then is there such a dearth of flowers around many of our farm homes? H. H. in a poem entitled "Poppies in the Wheat" gives one answer to this. In this poem she tells of the poppies in the wheat, and to her fancy they seem like tiny men, bearing torches along the shore of the heaving billow of grain, and she adds:

"The farmer does not know that they are there.
He walks with heavy feet,
Counting the bread and wine by Autumn's gain.
But I smile to think that years remain
Perhaps, to me, when bread be sweet
No more, and red wine warm my blood in vain,
I shall be glad, remembering how the fleet
Lithe poppies ran like torchmen through the wheat."

I cannot think this is wholly true of the farmer, for Nature gives to all, in varying degrees, a love of flowers. Mayhap in our eager chase of the dollars we lose the joy and enthusiasm with which, in childhood's days we hailed the first spring blossom, or pass, unseeing, by the hedge of wild roses in bloom in our eager haste to perform the money-getting duties of the farm, and our love of flowers becomes—not lost—but dwarfed and atrophied.

I am sure it would do us all good to look at our homes with seeing eyes, as we pass along the highway. Look at it, as a stranger might, admiring its beauties, criticizing its defects. Too often, from long familiarity we pass it by with unseeing eyes, not knowing that the burdocks and wild parsnip, or other plants out of place are giving our homes an unkempt, down at the heel look, and occupying space that would better be filled with blooming shrubs and flowers.

At some time in our lives, we all cherish a desire for a home with beautiful surroundings, and the plans that are made in

our bright-hued day-dreams are surpassingly fair. But springtime, the time when our enthusiasm reaches its height, is a busy time on the farm; for corn planting crowds the sowing of grain, and cultivating follows closely for weeds will not wait, and our beautiful ideal never materializes, but is put off from year to year, it may be at first with a sigh for the hope deferred, until finally we cease to think of or desire it, giving our whole time and energy to the crop that yields the largest and quickest money return, ignoring and putting out of our lives, the finer things that are worth more than gold. If we cannot do just as we would like to do, all at once, let us not go to the other extreme and do nothing. Patient continuance in the work, here a little, there a little, rather than occasional enthusiastic spurts, will work wonders in transforming our surroundings, and bring us each year nearer the beautiful ideal we all cherish in the innermost recesses of our hearts.

The wealth of the farm and our lives consists not in the money value of our possessions, but rather in those things that increase our pleasure and comfort and add to our usefulness. The love for and companionship of flowers, refines our tastes, cultivates a love of the beautiful, and surely, though silently, uplifts our better nature.

He labors well who builds a home, and doubly well if he adorn that home with the flowers Nature so lavishly bestowes upon us, making it a joy to the inmates—beautiful to the eye—fragrant with bloom—a fitting abode for a—FARMER.

A Member. I think the speaker's remarks are very true in regard to the many beautiful things that we have growing all over the country. From the interurban I noticed many beautiful wild flowers, bitter-sweet and the goldenrod, so many things that we might have for decoration, and we never think of planting them in our garden.

A Lady: In regard to the goldenrod, some people cannot endure it, think it gives them hay fever. Does any one know anything about that? If it is a nuisance, we do not want it.

Mrs. Howlett: If any one is troubled with hay fever, they can admire the goldenrod at a distance.

Mr. Toole: I should like to know if any one has found the foxglove very hardy.

Mrs. Howlett: For a number of years we have had it with

no protection except the leaves that naturally drifted over it, and it has proved hardy.

Mr Coe: I believe in trees, shrubs and flowers for another reason, I believe in them because all of us are better because we have them. I believe they have an effect upon our homes and upon ourselves. All of us, consciously or unconsciously, live up to or live down to our environment. If our surroundings are pleasant, comfortable and beautiful, we strive always to live up to these surroundings. I believe that. I think I can make some of you see it. Did you ever see a company of little girls get into their mothers' skirts? They are pretty big women, are they not? Did you ever see a company of boys play soldier? The boy that happens to be general of the company? He walks so stiff, you could not bend his back; if he meets a team the team has to get out of his way. All these surroundings and all these conditions have their effect upon us, and we can make our homes so beautiful that we are likely to be better men and women for it.

CANNING.

MRS. IRVING SMITH, ASHLAND. PAPER READ BY MR. SMITH.

HOME CANNING OF FRUITS.

In this paper we are going to discuss canning as it may be done by any woman in her own kitchen with ordinary cooking utensils. I prefer the porcelain-lined, granite or aluminum pans for cooking fruit, as one is less liable to burn or scorch the contents. Use glass jars for holding the fruit. There are many new kinds of jars on the market but the most widely used is the Mason jar as most of us have a supply of them on hand. New rubbers must be had each season, old rubbers stretch and the air is liable to get in.

Placing the new rubbers in warm water, in which a little soda has been dissolved, will put them in good shape to use.

Do not use covers that are bent out of shape or in which the porcelain is cracked or broken. It is best to replace all defective covers each season and save loss of fruit.

In the old days fruit and vegetables were prepared for winter use by preserving and drying. At the present time, canning is an almost universal way of keeping for winter use some of the fruit of which we have such an abundance in summer. The syrup for preserving fruits is much heavier than that used for canning. Bacteria do not grow rapidly in any syrup and cannot penetrate one with a large amount of sugar. Bacteria causes fruit to spoil—molds act in the same way. Consequently, bacteria which are in the fruit or jars must be destroyed and the air which contains them be excluded. When a liquid containing fruit boils, bacteria are destroyed; then if the fruit be put in jars that have been sterilized and the air completely excluded the contents will keep indefinitely. I have kept fruit two or three years and found it in perfect condition when opened.

To prepare the jars for holding fruit immerse in boiling water—see that the water covers the jars completely, inside and out, all at one time, so that they heat through evenly. Boil the covers thoroughly.

Choose fruit which is ripe, but not over-ripe. Always select the finest fruit for canning to get best results. Use the tender stalks of pieplant—cut in small pieces without peeling, as it is of a more delicate flavor and pleasing color than when peeled. Place in kettle with enough water to keep from burning, add sugar if you wish, or it may be canned without and sweetened when used. Boil until tender and put into sterilized jars; fill to overflowing, that all air may be excluded. Press fruit in jar gently with sterilized silver knife to further dispel air bubbles, then fill again to top. Take covers from boiling water and place quickly on the jars and screw tightly. After covers have been fastened turn jars upside down and place on table. In this way any leakage will be discovered. In about ten minutes try covers and tighten if possible, for as the glass cools it contracts. Set jars aside to cool and before removing to store room test covers once more to make perfectly sure that they are air-tight.

For canning apples—pare, quarter and put in cold water to prevent discoloration. Make a syrup, about a quart of sugar

to three pints of water. Bring to a boil; drain apples from water and place in syrup. Boil fifteen minutes or more depending upon character of the apple. When ready for canning the apple should be translucent but firm. However, some apples do not hold their shape when cooked, the Duchess in particular, makes a sauce of a snowy consistency.

Pears and peaches may be canned in the same way as apples—of course the amount of sugar used varies according to the kind of fruit. Many prefer steaming peaches and pears in the cans as they are less liable to lose shape and color. Strawberries, raspberries, blackberries, blueberries and plums are very fine cooked in the cans. Wash the jars carefully—clean the fruit thoroughly—place it in the jars until full, shake down carefully and fill again. Have ready a syrup made of granulated sugar and water or put sugar in jars with fruit and fill with hot water, being careful not to crack jars. My rule for using sugar is half a pound to a quart of strawberries or blackberries; quarter of a pound to each quart of raspberries or blueberries; three-fourths of a pound for a quart of currants or plums. When jars are filled remove covers from boiling water and place on jars. Put jars in a steamer or on a wooden rack in an ordinary wash boiler or kettle. Fill boiler up to the neck of the jars with water the same temperature as the jars. The small fruits need but ten minutes boiling, the larger from twenty minutes to half an hour. Remove jars from steamer or boiler, take off the covers and throw into a pan of boiling water. Press fruit gently to remove air, fill to overflowing with boiling syrup or water, quickly replace covers and screw on tightly. Test as in canning fruit boiled in a kettle, by placing jars upside down and when cool, tighten, if possible, once more.

In conclusion, I would say that successful canning of fruit is not such a hard task as many would think. Good sound fruit, kept at the boiling point until sealed, clean jars and utensils are the secret of success.

Mrs. Howlett: Have you good success in canning string beans and asparagus?

Mr. Smith: We have tried vegetables in Mason jars and very generally failed. We are trying this year the Hancock jar and we think we will succeed, because the air is cooked in and

the can is automatically tightened, so that there is no chance for explosion.

Mrs. Howlett: Do you recommend aluminum dishes to cook the fruit in?

Mr. Smith: We like them very much, but in cooking things with sharp acid, aluminum will sometimes give trouble.

Mr. Toole: I am glad Mr. Smith laid such strong emphasis on keeping germs from having a chance to get at the fruit. When this idea of canning was first brought forward, the proposition was simply to keep the air away and that was sufficient, merely to keep the bacteria away. Some years ago I read that you could put up fruit in an ordinary jar and instead of sealing it tight, cover with cotton batting. I tried the plan and it was a perfect success. The cotton batting strained the air and kept out the bacteria. We notice in opening up different kinds of fruit, there are different kinds of bacteria, sometimes mould, sometimes something else. Personally I do not like the Mason jar, and if you will at any time when you conclude to throw away the cover, crack the porcelain and look to see what is between the porcelain and the cover, you will know my reason for not liking them.

Mrs. Howlett: Has Mrs. Smith good results by putting sugar in the fruit and afterwards putting it in the can?

Mr. Smith: She has adopted that quite commonly, canning raspberries, putting the fruit in the can and in the middle, near the top of the can, put it in dry, shut it up, then put in hot water. I asked her why she did it; she said it was not quite so much work and it was equally as good. The sugar dissolves in there; there is no difference when the fruit comes out.

MY PRIZE CORN.

By J. MILLS SMITH, ASHLAND.

(Ten Years Old)

One night we saw a piece in the paper that the Superintendent of the Experiment Farm was going to give a prize to the corn raised the best by boys from ten to sixteen years old. So papa spoke to Mr. Delwhich about it. Then I went down

town to his office and got the corn to plant. We got one quart of corn. It was Wisconsin No. 8. I planted it on a rainy day. I tried to plant it with a corn planter but it wouldn't work and so I had to plant it with a hoe. I planted my corn on this year's plowed sod, plowed 9 inches deep. Manured well before it was plowed. Planted in hills 3x3 and three to five grains in a hill. The first time I hoed it I was so tired. The first corn came up in five days. When the corn came up it looked very nice and healthy. Then it kept on growing very fast. I hoed it every time the weeds came up. After a little while the corn began to show tassels and it wasn't long before there were a lot of tassels. Fourth of July we had a hard rain and it made my corn tip over, and so I had to straighten it up. Papa's boy cultivated it with the spike tooth cultivator. Then he cultivated it with a common potato cultivator, then he cultivated it with the potato hillers on the cultivator. The silk is growing very fast and prospects of a good crop. The ears are growing big and there are many ears coming and the stalks are very high. The corn has grown very fast since the tassels came out. The ears are growing fast and are beginning to lop over. The largest and highest of the corn is now about 9 feet high.

EVENING SESSION.

The meeting was called to order by the President, and opened with musical selections.

CONSERVATION OF BIRD LIFE.

BY DR. KUTCHIN.

Very briefly, ornithology is to be divided into four great divisions, the systematic, the philosophic, the economic, and sentimental or spiritual. I much prefer the latter term. With regard to systematic ornithology, which is at the very threshold of our study, I want to give you a few hints how to begin. Birds are classified by external resemblances, the feet, the tail, the bill, the wing, in families, and in species and sub-species

by similarity of color. In the study of birds, the majority of people beginning with the systematic study never get beyond the mere identification or species, and this amounts to very little indeed. To be sure, you want to know the common birds, but what is infinitely more important is to love them and to get in close relation with them and understand their importance in the scheme of Nature. The killing of birds for scientific purposes is an outrage. There are men who have license to rob nests and steal birds and do it in the name of science. Why have I no pictures here? Because it is impossible to learn ornithology from pictures; the difference between a slide made of the dead specimen and close contact with a living specimen is all the difference in the world. You might just about as well try to study child life by a study of rag dolls stuffed with sawdust.

When you want to study a bird, make yourself so much a part of Nature that the bird will come and investigate. And, mind you, the bird has seen you long before you saw it. What wonderful power of vision they have, what wonderful sense of hearing! Did you ever see a robin going across the lawn? Suddenly he will dart eight or ten feet and with the greatest precision in the world locate an angle worm and pull it out. How did it know the angle worm was there? Simply by the wonderful power of hearing. It heard that dumb thing moving in the ground.

The best time to study birds is in the fall, after most of the birds have gone away, then you will not be able to confuse them. And then remember, to classify them does not amount to very much, but to get close to them and to understand them and to know their habits, then you will become a real bird lover and all birddom is drawing near to you and you are drawing near to it. There are people who think birds are such an insignificant part of creation that it is beneath the dignity of grown persons to devote much time to their investigations. I want to tell you that the birds are the most wonderful part, like the flowers, nothing so beautiful and nothing so wonderful in creation as the possibility of bird life. When we were children, how common it was to call each other silly loons. Well, now, we all suppose a loon is a very silly thing. Just tell us what he does. Here is a loon, by-the-way, that we call the Northern Diver that measures about one cubic foot and

weighs about 15 pounds, and it has the power of submerging itself in water just with its bill out and remaining absolutely motionless, disturbing just 2½ pounds of water. How does he do it? Wonderful! Birds were undoubtedly developed from a reptilian ancestry.

You think you know all about migration. Why do birds migrate? You say because this cold weather drives them south; they migrate, they want food. Certainly, yes. And these birds are perfectly helpless in the darkness, just as helpless as chickens. Ah, we scarcely know that the young birds in the far north, hatched six weeks ago, are migrating possibly tonight in this darkness. Plenty of food. Driven by cold? They might pick out a latitude where it is frequently 10 below zero. They hurl themselves through space at an incredible rate of speed, 300 miles an hour, it seems almost incredible.

Now the economic value of the birds is impossible to exaggerate. Do you know the destructive possibilities of insect life to vegetation? Do you know that the San Jose scale is costing horticulture $10,000,000 annually? Do you realize that the codling moth and the apple worm are costing this country $16,000,000? Do you know that the cotton boll weevil is costing this country $25,000,000 annually, and the Hessian Fly $50,000,000,—a billion dollars annually lost through insect life, and we are destroying our friends the birds, the natural check upon that pernicious evil. See that bird going up that tree, examining every particle of the bole. There is a bird standing on its head eating his breakfast, or dinner, just as well as if he were standing the other way up. No boy could do that, eat breakfast standing on his head, yet the nut hatch likes to do it. Then see those birds examining every leaf on both sides; here are the birds on the ground after the insects and the weeds, and there is a fly catcher above the trees, a perfect police system going on on your farms, yet we are standing with folded hands and not crying for a federal law that will protect bird life. Down in Texas within the last two years in one season they have marketed 10,000 dozen robins; you can go into New Orleans and buy them by the barrel.

It is estimated that weeds cost us one dollar an acre. What a ridiculous estimate! It pretty nearly divides the cost of the value of the crop in some cases. Would you like to have an acre of onions or flowers taken care of for a dollar? Just sup-

pose that it costs only a dollar, but it is treble that, how greatly it might be lessened by our friends, the birds. They made a bird census in the state of Iowa and ascertained the number of tree sparrows in that state. A bird is a great eater. In the stomach of a chickadee have been found as high as 3,000 larvae gathered from the bark of your trees. A quail was killed near Wheeling, West Virginia, a few years ago on Christmas day—of course the day may have had something to do with its appetite—in its craw were a little over 10,000 pigweed seeds. A mourning dove has been killed with 3,500 chicken grass seeds in its crop.

In regard to this census in the state of Iowa, they arrived at some most startling figures. A tree sparrow eats one-quarter ounce of weed seed a day; multiply that by the number in the state and from October to April they carry out of that state, absolutely destroy so that it will never grow again, being thoroughly and completely digested, 875 tons of weed seed. Load that on farm wagons and they will reach pretty nearly half way over to Omro. It is immensely discouraging that birds are being slaughtered everywhere around us.

I am glad there is to be an inspection of nursery stock in this state. I wonder if you all know that a firm in New York state has for forty years blocked legislation, and America has been the dumping ground for pretty nearly all the world, and countries that have prohibitive legislation and will not allow us to send in to them, are sending their infected stock to us. I am glad that we are to have some protection in Wisconsin, but think of the other states. Do you know that New England is paying about a million a year fighting the browntail and gypsy moth? Do you know the government is paying about $300,000 every year to try to protect the highway so that carriages and automobiles will not carry the larvae of those disaster working insects into other territory? Three hundred thouand dollars, and the aggregate business of these men who have blocked prohibitive legislation does not amount to over $350,000.

Now, the despised blue jay. I once saw a boy kill a blue jay and asked him, "What did you do that for?" He said, "My father told me to kill blue jays, that they suck eggs and drive other birds away." As a matter of fact, the Biological Survey took that matter up, and the United States Government examined the stomachs of 292 of all those killed during the

breeding season in almost every state and territory, and in the stomachs of two they found shells, and they could not tell whether they were shells of birds' eggs, or shells cast into the garbage can.

What is the jay doing? He is doing more than anything else in checking the ravages of the browntail moth and gypsy moth. I wonder if there is a man here who, if he saw a bird in his cherry tree, would run for his gun. For every cherry that that bird ate it destroyed insects that gave you 100 cherries, plus its song, which is an almighty sight sweeter than your cherries. J. Stanley Hall, of Clark University, has in his hands a thousand dollars to be paid to the man, woman or child who will locate a single pair of passenger pigeons either in this country or in Canada. Just send him the location, he will identify them, and he has cash in hand to pay you for the information. This means that we have been destroying bird life in all its beauty and sweetness.

Tennyson knew birds. Here is a fragment,—the "Eagle."

"He clasps the crag with hooked hands
Close to the sun in lonely lands,
Ring'd with the azure world he stands
The wrinkled sea beneath him crawls;
He watches from the mountain walls;
And like a thunderbolt he falls."

There is the eagle. You cannot add to that very much. Now, why does he fly above the water? He had on his far-sighted glasses and there was a fish in the water below him.

There is nothing so splendid in the world for children as to become nature lovers, nothing so fine for a man or woman anywhere. People say to me, "Are you not lonely in the winter over there at Green Lake?" I say to them: "I am never lonely except on State street in Chicago."

"To him who in the love of nature holds
Communion with her visible forms,
She speaks a various language."

"For his gayer hours she has a voice of gladness and a smile
And she glides into his darker musings with a mild and healing sympathy
That steals away their sharpness ere he is aware."

THURSDAY MORNING SESSION

LAWS OF 1911 AFFECTING MEMBERS.

C. L. RICHARDSON, STANLEY, WIS.

Every new law, so far as it is obeyed or is enforceable will, it is presumed, affect our members to a certain extent. Thus the taxation of incomes of single persons in excess of $800 per annum, and incomes of man and wife in excess of $1,200, will doubtless fall upon certain of our more wealthy members, but as the tax is $250 for incomes of $10,000 per year it is probable that not all our members will be oppressed thereby.

Chapter 556, revises sec. 1463 of the R. S. 1898, to repay to county fair associations 80 per cent of the premiums paid by them on agricultural and other exhibits. The former rate was 50 per cent. This change in the law opens the way for larger premiums for apples, plums and other fruits, and may well lead to the awarding of third premiums on fruits, a matter now disregarded in too many fairs.

By chapter 379 the display or storing of fruits, vegetables or other foods on the sidewalk is prohibited unless they are securely covered with glass, wood or metal cases, or enclosed in tight cases, boxes, bags or barrels, and raised two feet above the sidewalk. The provisions of this section do not apply to fruits or vegetables which are peeled or skinned before being used. The owner of any store violating this section shall be fined $10 to $50 or 60 days or both fine and imprisonment.

Chapter 583 provides for the creation of a new Commission on Public Affairs, consisting of the Governor, Secretary of State, the Chairmen of the Finance Committees of Senate and Assembly, and three other members. This commission is empowered to investigate every office, officer, department, board and institution, the conduct or operation of which involves the receipt, expenditure, or handling of any state funds or

property. As our society receives a state appropriation we come within the jurisdiction of this commission. Thirty days before the convening of the next legislature, the W. S. H. S. will be required to submit an estimate of its receipts and expenditures for each fiscal year of the ensuing biennial period. The Commission may inquire into the methods of conducting our affairs, prescribe and direct the forms of accounts and blanks to be used, and co-operate with us in developing the resources of the state, and making known the possibilities of Wisconsin.

The rabbit law has been amended so that there is no closed season for rabbits in the following counties: Crawford, Grant, Iowa, Kenosha, Lafayette, Sauk, Door, Bayfield, Chippewa, Douglas, Price, Rusk, Taylor, Racine, Burnett, Polk, Barron, St. Croix, Richland, Monroe, Winnebago, Langlade, Forest, Florence, Shawano, Jackson, Clark, Sawyer, Washburn, Ashland, Buffalo, Pepin, Oconto, Adams, Marquette, Fond du Lac, Oneida, Iron, Vilas and Vernon.

Chapter 325 adds a new section to the statutes making it a misdemeanor for any person to manufacture or compound within the state, or to import or receive or sell any adulterated or misbranded Paris green, arsenate of lead, or insecticide or fungicide, and it is made the duty of the director of the agricultural experiment station and the district attorney to enforce these provisions. A peculiar provision of the law exempts the dealer from punishment if he can establish a guaranty from the vendor that the same is not adulterated or misbranded. The four terms are legally defined: Paris green must contain at least 50 per cent of arsenious oxide, not over 3½ per cent arsenic in water soluble form, and shall not contain any substance which reduces or injuriously affects its quality or strength.

This same qualification applies to arsenate of lead, also it shall not contain over 50 per cent of water, nor less than 12½ per cent of arsenic oxide ($As_2 O_5$). Insecticides and fungicides are defined in like manner, and the term "misbranded" is defined as covering "any statement, design or device regarding such article or the ingredients thereof which shall be false or misleading in any particular" such as weight, place of manufacture, efficiency, and pests or diseases against which the same is pretended to be effective. The covering of

the package must state the amount of percentage of active ingredients, and the total amount of inert ingredients, to be named or not at the discretion of the manufacturer.

From the standpoint of the horticulturist, perhaps the most important law of the year is the revision of weights and measures embodied in chapter 566. The law is too long to be quoted in its entirety, so faultily constructed and contradictory in terms as to be difficult of definition. I do not believe all its provisions are enforceable. More attention is bestowed upon the salaries of the numerous officials created for its enforcement than upon a fair and accurate definition of standards, or a sincere effort to secure fair treatment for the purchaser while respecting the honest wishes of the members of this organization.

The dairy and food commissioner is made superintendent of weights and measures, with general supervision of all scales and measures throughout the state and power to inspect, test, correct, condemn and destroy the same. All cities of 5,000 or more inhabitants are required to appoint a city sealer, who shall test all local scales and measures at least once a year, and prosecute all violaters of the law.

Some changes have been made in the weights and quantities of certain products. Thus tomatoes are to be sold by weight, unless otherwise specially agreed in writing, 56 pounds constituting a bushel, 50 pounds for a bushel of hickory nuts, 35 pounds for a bushel of cranberries, etc., while "all dry commodities not otherwise specified in this act shall be bought or sold only by standard dry measures, standard weight or numerical count except where the parties otherwise agree in writing."

Section 1666 has been rectified to declare the custom and fact, that 2150.42 cubic inches shall constitute a *struck* bushel, but the law then goes on to provide that in measuring fruits and vegetables the half bushel or other smaller measure shall be heaped as high as may be without special effort or design. In other words, the law defines struck measure but does not define the quantity in a bushel *heap measure*, and then compels the farmer, fruit man and grocer to sell, at his peril, his fruits and vegetables by "heap measure." This section should be amended to some fair and consistent form.

The dry gallon of 282 cubic inches is abolished. The old apple barrel holding 100 dry quarts is abolished, the new provision reading:

"The standard barrel for apples or pears or other fruit, unless otherwise specifically defined, shall have an interior capacity of 7,056 cubic inches, and shall not be less than 26 inches between the heads inside; the diameter of the heads shall be 17⅛ inches including the beveled edge; the outside bilge or circumference shall be not less than 64 inches, the thickness of the staves being four-tenths of an inch; provided, however, that any barrel of a different form but of an interior capacity of 7,056 cubic inches shall be a legal barrel." This barrel appears to contain about 3 bushels and 1 peck.

It is interesting to compare the figures 26 by 17⅛ and 64 inches with the dimensions 25¼ by 16¼ and 58½ inches, these latter being the dimensions of the standard cranberry barrel.

While all persons will not agree as to the wisdom of these particular dimensions, it will be generally conceded that the defining of a standard barrel is a much needed step in the right direction.

The "bushel" crate whose contents were problematical has been defined: "A bushel crate of apples, pears, plums, peaches, and other fruit not secondarily contained in quart or other boxes within such crate, shall have an interior capacity of one bushel heap measure." I respectfully submit that this provision should be amended to have the crate contain one bushel struck measure.

"A bushel crate of cranberries or blueberries shall have an interior capacity of one bushel struck measure." This is a fair provision to both producer and consumer and does away with the former cranberry crate which was two or three quarts short measure.

The much discussed "berry-box law" reads as follows: "All sales of blackberries, blueberries, cranberries, gooseberries, raspberries, cherries, strawberries and similar berries in packages of less than one bushel shall be by the quart, pint or half pint dry measure, and all berry boxes sold, used or offered for sale within the state shall be of the interior capacity of not less than one quart, pint or half pint dry measure. Any person violating the provisions of this paragraph shall be pun-

ished by a fine of not less than five nor more than fifty dollars and by confiscation of the illegal boxes or packages and of the fruit therein contained." Provision is also made for all standard apple and cranberry barrels to be stamped with the letters "W. S. A." and "W. S. C." for apple and cranberry barrels respectively, and the manufacturer's name, and for fines for failure to so do.

"All contracts for the sale of apples, pears, cranberries, or other fruits by the barrel or crate, unless otherwise expressly stipulated, shall be constructed to mean barrels or crates of the capacity herein prescribed."

The law attempts as far as possible, to place similar restrictions upon fruit shipped into the state, by providing: "It shall be and is hereby declared unlawful for any person or persons to bring, transport, or convey into the state, or to sell, offer to sell, or otherwise dispose of for profit, any apples, pears, plums, blackberries, blueberries, cranberries, gooseberries, raspberries, strawberries, or other fruits, except the first sale within the state in the original packages, unless the crates, boxes, barrels, or packages wherein the same are contained shall be of the full interior capacity required for sale in the state to comply with all the provisions of this section as fully and completely as if the said packages had been packed, and the said fruit grown in Wisconsin. Any person violating the provisions of this paragraph shall be punished by a fine of not less than $25 nor more than $50 and by confiscation of the illegal packages and of the fruit therein contained."

Until January 1, 1912, nothing contained in this act shall prevent the use, sale and disposal of crates, boxes, barrels and packages not conforming to these standards.

An inspection of the law as it now stands would seem to indicate:

1. The law cannot prevent the sale of apples and other fruits in crates of one struck bushel interior measure—for there is no penalty for so doing. The triple penalty applies only to sales in *barrels.*

2. The law does not prevent sales of fruits in crates and barrels of less than the standard capacity, *by agreement of the parties.* Can sell by standard weight in scant bushel crates or barrels.

3. The law cannot prevent the sale *without the state* of any size of crate, box or barrel, containing fruit, nor can it apply to contracts of sale made within, for deliveries to be made without the state.

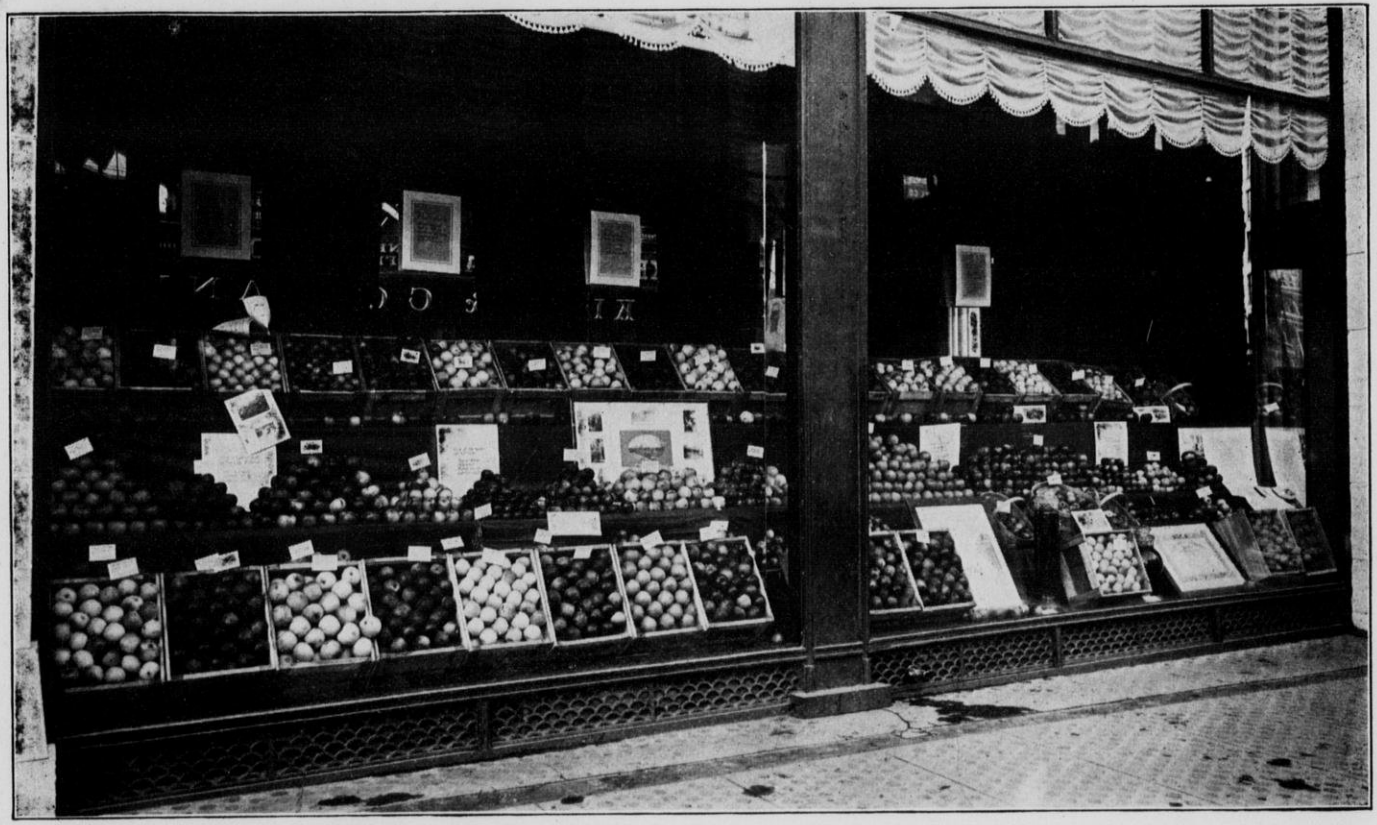
4. The only penalty for selling apples, etc., in scant barrels, is the penalty of three times the deficiency and court costs, in case action were begun.

5. Sales of strawberries, etc., must be by the quart. There is now no established custom that a full quart box shall be heaped. Section 1666 provides for the sales of fruits customarily *sold by heap measure,* while section 1668, subsection 10, is silent as to whether the quart shall be heaped or not. It is at least a question of doubt whether the grower can be compelled to heap up his quart box under the new law, especially as the law merely directs that the interior capacity of the box shall be one quart.

6. This law is designed to prevent the competition of scant quart crates from outside the state. It would seem that the provisions of section 1668—14 are constitutional and do not contravene the decisions of the interstate commerce decisions, in that they only apply to secondary sales within the state, and except from the law the first sale within the state in the original packages. The original package is the crate, the small box therein when sold is a secondary sale and not in the original package. This provision cannot be made to apply to apple and other fruit crates and barrels but the "W. S." sign on the barrel will be a guaranty of a standard barrel, and its absence will at least put the purchaser on his guard.

7. It would also appear legal to sell scant quart boxes and crates to customers without the state, free from any penalty therefor.

8. The quart is nowhere defined, but as it is a thirty-second part of a bushel, it would appear to contain a thirty-second part of 2150.42 cubic inches, or 67.2 plus cubic inches. Personally I believe very strongly that the change from the liquid to the dry quart in the sale of fruit was a mistake, and that the law should be amended. If it is not the answer of the horticulturist must be to increase proportionately the cost of the box or crate. A moment's calculation makes it clear that the dry and liquid quarts bear the relation of 6720, 5775 to each other. If a liquid quart case sold at $1.00 a dry quart case



Store window Exhibit of fruit previously shown at State Fair.

Grand Ave., Milwaukee Sept., 1911.

should cost $1.16½ and if the liquid quart case cost $1.50 the dry quart case should sell for $1.75. In other words, there must be the sharp rise of 16½ per cent next year in the price of strawberries, raspberries, etc., due to the larger box now demanded.

Prof. Moore: I should like to ask Mr. Richardson in regard to selling plums. We sell one-fifth bushel climax baskets; how is the law going to affect that?

Mr. Richardson: I should think in that case it will have to be ⅕ or ⅙ of 2150.42 cubic inches.

Prof. Moore: When you sell a basket of plums, you never make a statement as to the size of the basket, simply sell it as a basket of plums?

Mr. Richardson: Certainly.

Prof. Moore: I know people who are using ⅙ bushel baskets, and other people ⅕ bushel baskets, yet they are sold as so many baskets of plums.

Mr. Richardson: We will see if there is not a provision applying to that. There is no provision in regard to the plums being sold by the quart, so that I should think if they are quoted as containing a fractional part of a bushel, that they will actually have to contain that part of a bushel, simply let it go at that. There is a point that is not specifically provided for. This law is highly penal, it will be rigidly construed, just as they do the game law.

PLANT BREEDING.

C. B. WHITNALL, MILWAUKEE.

Although plants as well as animals have evolved by natural processes of reproduction which may be called breeding, we have come to associate with the term "plant breeding" the idea of some connivance of man, whereby he is to acquire some personal benefit. And just now, when civilization is actuated by near-sighted policies, what is considered his personal benefit, proves to be a general loss or waste. The results are not usually happy ones. It seems strange that man should take such pains in breeding for himself everything *but himself.*

Although supervised breeding appears to be actuated by a desire for winning dollars, and the poorer specimen of man being the support of modern civilization, his so-called freedom having destroyed his intrinsic value, no investments commercially are made in that direction.

If in place of exploitation of our fellows by various processes of graft some of us would acquire ownership of the others, the dollars involved would argue in favor of intelligent breeding.

Truck gardeners, fruit growers and florists are constantly on the lookout for new varieties which will please their customers without increasing his labor to produce.

Specialized labor has developed to a point where "the breeder" is maintained much the same as inventors of machinery, promoters of gold mines, fortune-telling, etc.

> "Ill fares the land, to hastening ill a prey,
> Where wealth accumulates and men decay."

Of course there is a love for truth that impels the broad-minded scientist to pursue every path of nature in quest of wisdom for the world. I have faith that he will rise, phoenix-like, above the degradation of modern commercialism. He is building the foundation on which we may all unite in economy and harmony some day. But in this day he is like the well meaning preacher of the gospel, supported from pew rentals paid by the gambler, usurer, keepers of disreputable places, etc.

Nature's processes are so extremely complicated we understand comparatively little of what we accomplish.

The production of life seems to be very much like the generation of electricity. We have discovered ways and generally know when we have it, but do not know what we have.

The successful plant breeder is a detective. He creates but little, but watches nature's developments and is quick to kidnap a child that will ingratiate itself with those who are able to "pay the piper." The more I observe, the less confidence I have in direct application of energy to make a change in product of conduct of plant or animal. And the more I am convinced that environment influences the destiny of every new life generated within its influence. However, I am not

quite as radical in this contention as the seed grower who discovered that the best crops of red clover were obtained from localities where old maids were numerous, because they kept many cats. The cats destroyed the field mouse which enabled the bumble bee to become numerous and make a thorough job of fertilization.

There is one feature of reproduction called "vegetative propagation" which I think should be considered first, although it is not really breeding.

We raise our potatoes from the tuber, not seed; most of our ornamental trees and greenhouse plants from cuttings. There is no crossing.

With plants propagated vegetatively, there are several kinds of variations to consider. There are fluctuations due wholly to environments, difference in food supply, moisture, etc.

Experiments and careful observations for many years have proven quite conclusively that fluctuating variations due to such influences do not change the plant from year to year. There seems to be no inheritance of changes induced by environmental influences. Where the descendants of an individual varied greatly in size, it was thought that by selecting continually from the largest and the smallest, two races could be developed.

Experiments have been carried on for a very long series of generations, one line consisting of the largest, the other line of the smallest, progeny. At the end of the experiment the two lines were brought under the same environmental conditions, and within a very short time the average size of the two types became identical.

Until some one can show that selection is effected within pure lines, it is only a statement of fact to say that all the experimental evidence we have is against this. The southern swamp cypress now used for greenhouse lumber with its peculiar club roots sent to the surface for air, we find is a Venetian, driven to the swamps, and when planted on a hillside, loses all its characteristics which had been induced by swamp environment, and goes right back to its original habits.

There is a feature of development, however, that will mislead a novice. The florist calls it "sporting."

About twenty years ago the Cath. Mermet Rose was introduced, a pink variety. That is to say, it looked pink when introduced, and became quite popular. Mr. John N. May was a leading rose grower then and had two houses devoted to this rose. They were growing particularly strong and it was noticed that May's Mermets were "sporty inclined." So a close watch was kept. One day came a side shoot bearing a white flower, more rugged and perfect in form than the pink, and more beautiful than any white variety in market at that time. He propagated from it naming it "The Bride." It is still a popular variety, but the C. Mermet has "run out." The fact of the matter is the Cath. Mermet was simply an undeveloped "bride," some of its qualities remained latent for a long time. It required Mr. May's skill to develop the child in accordance with its inheritance.

We have many undeveloped "Brides" among our children. Those who keep our Truant Officer and Juvenile Court busy and whom we permit to be punished because of our failure to maintain environmental influences that will properly develop and bring out the *latent* qualities.

Environmental influences which develop or bring out these latent characters, if removed, cause the character to become latent again. The Bride Rose may show pink again, and then disintegrate entirely. The next feature to consider is the self-fertilized species. The effect of selection in such species as wheat, barley, and oats, is essentially the same as by propagation vegetatively, although seed is formed, and we call it breeding.

ENVIRONMENT THE PRINCIPAL FACTOR.

There is no question about our individual development being controlled by environment more than all other factors.

But whatever environment produces, will vanish like your reflection in a mirror as soon as you disappear.

There can be no heredity of such influential effects by the individual so influenced.

Herein is the important function of the breeder, for such acquired characteristics can be fixed in or transmitted to its progeny.

Burbank says, "Environment is the architect of heredity" or heredity is the sum of all past environment. The results of

environmental influences can be fixed only by crossing with plants not too closely related.

It seems that these acquired characteristics are impressed or conformed to by the germ cells. It is *their* function to transmit the rearranged formula of construction of the progeny. There is no other way, and the reason I say to cross with plants not too closely related, is that the closer related parentage is the nearer you come to conditions of self-fertilized and vegetative propagation, already referred to which do not fix or hold on to improved character.

The skill of the breeder is in the selection of the parent to cross with the strain or variety he desires to improve, that will not combine other characters strong enough to dominate in the progeny as to vitiate the development or improvement sought.

The progress is dependent primarily on cultivation and improvement of the individual, which in turn is controlled largely by environmental influences. Then to fix improvement by cross-breeding, I have spoken frequently of environment. There is also what is called place effect that is interesting. I may raise tomatoes in a dozen different exposures in Milwaukee and call it an assortment of environments. But if I compare a crop in Milwaukee with one in Memphis, we would speak of place effect.

If a northern tomato is raised in the south, the first crop of fruit will be like it is in the north. But the second season's crop will be entirely different and remain thus different for generations. Then bring it north, the first crop will be as in the south, but the second season it will be back to its original northern character.

The process of crossing, of course, becomes complicated. I cannot go into detail for lack of ability on my part and time on yours. But I will give you just one of Gregor Mendel's discoveries which pertains to what he has called "The law of dominance."

A red primrose crossed with a white primrose yields purple primroses. But these purple hybrids will produce three kinds of progeny. About one-fourth will be white, about one-fourth will be red, and about one-half will be purple. These white and red will go on producing pure colors, but the purple will

continue to divide into white, red and purple. The purple always splits into the same proportions.

Mendel suggested that the cause of these peculiar phenomena is that the hybrid produces two kinds of ovums and two kinds of pollen. The one kind of ovum and one kind of pollen being exactly like those of one of the parents of the hybrid so far as the one character under consideration is concerned. The other kind being like those of the other parent. This theory has been fairly well sustained.

When we consider that environmental influences act the same on the individual as on plants, that our children are being shaped and tempered by these influences, it is quite apparent that the future of our civilization is dependent upon the environment of the rising generation. Statistics show that in our large cities there is a deterioration. It is the mission of the city planner to determine what these devitalizing effects are, and reconstruct our cities so as to be economical and healthy.

Although humanitarian impulses should be enough to insure the requisite improvements, it is interesting to note that the heartless (successful) business man is beginning to read a "hand writing on the wall." Germany is taking a lead in skilled labor today because by better city the health and skill of labor has improved, and although some of our capitalists say the expense is prohibitive,—Germany is also proving that it is economy. Over 1,500 cities and towns now have no tax levy at all. There are a great many thinking skillful Socialists in Germany.

Think it over Mr. Profit Hunter. See that a normal atmosphere, sunlight and clean water is administered to every soul. See that dust, noise, waste energy is avoided. See that natural recreation is universal and that community values go to the community. Then human breeding will balance plant breeding. We can never be normal until they function together.

THE NEED OF PLAYGROUNDS FOR THE CITY CHILD.

SIDNEY A. TELLER.

The first American child had the chance, right and opportunity to play. The young American Indians enjoyed unlimited playgrounds and supervised play. Physical development was an important factor in the education and training of the child. With the "civilization" of America, and the growth from rural village to cosmopolitan city, we have made great progress in all things, except proper provision for places for children to play.

Why should we have playgrounds and supervised play? Won't the streets, alleys, vacant lots and back yards do? All these things at their best are makeshifts, and lack the two greatest factors in the value of a playground, supervision and the social and civic emphasis to the play. Streets are not a safe place, neither to life or morality. Delinquency starts with degenerated street play. The "gang" is an expression of unsupervised street play, and the "gang" is known for the bad things it does. The street is bordered by saloons and other undesirable places for children to be around. The "vacant lot" is usually full of debris and filth, making it a poor place for children to play. Alleys are the places for garbage and wagons, but not for children to play. The back yard is too small for the social group—and the child who plays alone develops the spoilt child who does not know how to share playthings or learn the value of being part of a "team" or "side."

The large parks are usually too far away, especially for children. Children will not go over a half mile to play. The large parks are usually full of "keep off the grass" signs and are built to admire and not to use. The large parks may do for stiff, formal play on Sunday or when the parent can take the child, but for spontaneous, wholesome play, the child wants a playground equipped with playthings, play-opportunities and a play-leader as well as other play-fellows.

Play is a serious thing in the life and development of the child. Play is the fundamental right of the child. Play is the inalienable right of "life, liberty and the pursuit of hap-

piness" for the child. The first civic expression of the child comes on the playground. The sand pile republic precedes the public school and the junior citizen of three or four years of age learns to build a city out of sand houses, with other children, on the sand pile. The playground becomes the outdoor school room, open and used after school hours and during the long school vacation. Under the guidance of a playleader, the old "gang" becomes a "team," and the old impulse of the boy to do things is given a good and proper outlet. The degenerated street play and games take on a new aspect and we give back to childhood what the city has robbed the child of. Health and morality replace delinquency and disease, and "fair play" means ethical development.

The child of today is the citizen of tomorrow and the greatest investment we can make is in good citizenship. Land values are going up. We buy land today for factory and railroad before it rises in value. Why not plan your cities with reference to the child and see that sufficient playgrounds, the lungs and breathing spots of the city, are purchased *now* before the problems of congestion and transportation are too serious? A city is judged by the children it keeps and the principal thing in those children is the development of the play instinct.

Children cannot plead for themselves or plan for themselves. We, the adult citizens of the community, men and women, demand that the child be protected in its right to play. We ask conservation in child life—the greatest natural asset this country has. We ask for the welfare of the child, not more hospitals, juvenile courts and jails, but the great factor of prevention, playgrounds. Let a little child lead us and the problems will not seem so hard. There is no man so bad that he would not make a child happy—there is no city that is progressive that is not providing playgrounds. There are over five hundred cities in the United States that have playgrounds. Thousands of children in Wisconsin ask for "fair play" from their parents. Their plea is for playgrounds *now*. How can you assist them?

AFTER FOUR YEARS.

MR. IRVING SMITH, ASHLAND.

Mr. Smith: The Secretary asked me to talk a few minutes on what was most interesting to me in the gardening proposition. Four years ago the first of August I had moved from Green Bay to Ashland, Wisconsin and went to work as superintendent of the Industrial Department of the Northwestern College at Ashland. After working there for three years I resigned, and in my resignation I said I thought I could do more for Northland College and for the community in general in another line. So I bought about 30 acres of land, a farm, if you please to call it that; however, it abuts up against the high school on one side and the college on the other side, right in the city of Ashland. ten minutes' walk from the main business street. I told the mayor and some others that I was going to try to make a place that the city of Ashland would be proud of and that I could be proud of. I have been at it two years, this is the second year now.

The first seed planting I did in Ashland was about this time, perhaps a little earlier. I planted some lettuce, radishes and spinach, and was surprised at the rapidity of growth. In the following spring I made a rude hotbed, produced some lettuce and other things. The soil is sandy with quite a bit of clay mixed, and the first season I plowed up a heavy June grass sod, which was the first plowing the soil had ever had. We had very fine tomatoes, cabbage, egg plant, celery, cucumbers, in fact, a general line, just as a kitchen garden for the institution. We had tomatoes up to about Thanksgiving time, by throwing old straw over the vines just as they were in the field. At our county fair tomatoes on exhibition weighed two pounds each, Ponderosa tomatoes, I never saw finer ones at the State Fair. We have had musk melons every year since we have been there; they are not now as far along as they are here, but coming on nicely.

We have the most delightful climatic conditions in the summer time that I ever saw, and I have heard the same from quite a number of people. It is warm and yet it is cool, seldom oppres-

sive, almost invariably comfortable,—well, once in a while we throw a little wood in the furnace in the summertime, on a chilly, rainy morning, just to take the chill off the air. The rainfall in the four years we have been there has been very ample. Last year while in the southern part of the state there was almost no hay, in many sections we had a light crop of hay, but a long ways from a failure. When I left home my second cutting of alfalfa stood nearly waist high. That alfalfa was planted on the 6th day of July last year, and on the 12th day of September, 66 days after the seed was planted, I mowed an average of 18 inches. We will get another mowing. We go out into the woods where the timber has been cut, which in our immediate vicinity was hardwood and Norway pine largely, with some white pine mixed in, and there is now a growth of common poplar and two or three varieties of white birch, and red clover, white clover, alsike clover and timothy runs out the raspberry bushes. Red raspberries come in and they last for a few years, until what we call the common, tame grass runs them out. You can go through that young poplar and birch grove almost anywhere and find timothy and clover from two to three feet high all through that wood. There is pasture for thousands and thousands of cattle there within walking distance of Ashland which is unused because of the state law which requires that we fence against other people's cattle. Red clover seems to grow very easily. In that connection, you can sow your lawn any old time that you get it ready; here, if you sow your lawn in the summer time the chances are that you get no grass unless you keep the sprinkler busy. Rains come frequently enough and heavy enough so that grass comes readily; in fact, one of the most common weeds in your field is timothy. Of course we have most of the other common weeds, including two varieties of Canada thistles. I can give you some white ones if you want them for decorative purposes, they both do very well.

I set out a little orchard this spring, about 140 trees, you can find spurs from 12 to 18 inches long, this year's growth on newly set trees. That shows a good, strong condition. The only trees out of that 140 that have died were two or three cherries and one or two plums which I moved from a quite dry location to quite a wet location and I think the cherries drowned.

In flowers we seem to be able to produce almost anything that is produced down in the southern part of the state; we have great masses of phlox, dahlias, gladioli and other annuals doing very well.

A Member: Do strawberries ripen later than here?

Mr. Smith: Strawberries come on the latter part of June and early July. The season, going north, other things being equal, varies about one week per 100 miles, and we are about 200 miles north of Oshkosh, so that our season will be about two weeks later than your season. But we are located on Lake Superior, right in sight of the water, the largest body of fresh water in the world, and it seems to have a softening effect on the air. We do not suffer from late spring frost nor early fall frosts. Last fall on Thanksgiving day I cut in the field a cauliflower that was in fairly good condition; it had been nipped somewhat by the frost. There was one or two inches of snow on the ground at that time. We have tomatoes until well along in November. We had celery last year that weighed about two pounds to the stalk; we have cabbage now that will weigh 10 or 12 pounds. We had our first early cabbage to eat on the 4th of July. In Green Bay it used to be our aim to put cabbage on the market on the 5th of July, but we did not always do it; the earliest we ever sold cabbage was the last day of June. We began selling up there this year a little after the middle of July.

Mr. Sperbeck: How do apples do up your way?

Mr. Smith: They do finely. I have got six, and they must be as large as those plums over there, now. The apples in our county are not in bearing yet, only in isolated instances. Nearly every farmer that has been on his place any length of time has a little apple orchard, quite a good many are being set. The trees look well, generally speaking, and a few are coming into bearing. Quite a good deal of small fruit is being set in the way of strawberries, raspberries, gooseberries, currants, dewberries, etc., and so far as I know, in every case are doing well. I have put in some strawberries for next year. In the woods you will find all kinds of small fruit on everything, from a little bit of a plant four inches high up to trees. Fruit seems to be the strong point of Nature there.

I would like to impress upon you people the idea that the extreme northern Wisconsin, by that I mean that part which is on the Lake Superior drainage system which runs back from 10 to 30 miles from the lake, is a good place to go to make your living. I have not any land to sell, and have no friends that have land to sell. The soil is strong; we have lots of sandy soil; we have a lot of clay, but not brick clay that will stand, as it does here. If we strike clay, unless it is pretty dry, we want to lookout, or we will be buried, it will slide right down. There seems to be some sort of slippery consistency to the clay that is different from central Wisconsin clay. If you throw clay out on top it will become like rock, but in a little while it begins to crumble and goes to pieces, slacks like lime, and does not go back to its first consistency.

The winters are I think less dry than southern Wisconsin winters. While we have perhaps extremes of cold; if you have it 30 degrees below zero we are liable to have it 35; if you have 40, probably we have 45, but those times, as in central Wisconsin, last a very few days, and I think most of you will agree with me that if we are going to have it 30 degrees below zero it might as well be 35 or 40, so far as being out and working in it with any degree of comfort is concerned. The general winter weather has been from 10 to 25 above zero; sleighing usually comes along the holidays and stays till spring. We can usually plant in April. There are thousands of acres of land for sale at all sorts of prices, if any of you are looking for new locations to start in, look up northern Wisconsin.

The President: Owing to lack of time, we will have to cut out discussion on this paper, and take up the next subject on the program, a short talk by Prof. Sanders.

Prof. Sanders: A question was asked me this morning by a person who I thought was fairly well posted on the organization of the University College of Agriculture and Experiment Station regarding the nature of the work, and I was surprised at the apparent lack of understanding of conditions down there, so I will take just a moment to explain them. Fortunately, in Wisconsin the College of Agriculture and the Agricultural Experiment Station are one and the same body, so that one corps of men can take care of all lines of work.

The College of Agriculture is made up of a number of different departments, with experts in each department. We have a large number of departments, the Department of Animal Husbandry, Dairying, Horticulture, Plant Pathology, Entomology, Poultry, Veterinary Department, which is a recent addition, a Department of Home Economics, the Extension Department and a number of others. When any of you write for information, if you do not know the exact department to write to, it makes little difference, because a letter addressed to the Agricultural College will be opened at once by the clerks and sent to the proper department. We want to ask a stronger and more hearty co-operation of the people in our work and we can arrive at that co-operation better by understanding your troubles and hearing all the questions that you encounter in your work. Write to us, tell us what your troubles are, send us specimens, if insect trouble or a fungous disease and we will be glad to send bulletins to any one who wants them. A postal card addressed to the station will obtain these bulletins along any line you wish. It has been said by many foreign investigators that we have the best agricultural college; it was so considered when I was in Washington, we think that it is today one of the leading institutions in the country. Now, the departments that appeal to the horticultural members principally are the Departments of Horticulture, Plant Patholgy and Plant Entomology. The Department of Entomology is the one I am interested in.

In the Department of Economic Entomology, we carry on experiment station work, inspection work and Nursery Inspection. The latter phase of the work has occupied most of my time for the last year and a half. The conditions in the nurseries in our state are on the whole fairly good, not what we might wish, but they are really better than they are in some states that I know of, but our nursery interests are not up to the high standard that they should be. They are not co-operating with the experiment stations, nor are they interested in our horticultural progress as they should be. There is very little advertising done by the nurserymen in our state. For instance, I represented this society at the Michigan State Horticultural Society last year, and I was very pleased to note that they had a building twice the size of this room in connection with their meeting, at which the nursery-

men exhibited their stock and had literature for handing out, and a number of manufacturers of insecticides had their material and samples to give away, a great many makers of spray pumps had their machines there and they went to considerable trouble to exhibit the working of their machinery and it really paid them to do it. I wish another year we might get something in connection with our own state society. I frequently run across people among our horticulturists who do not know of nurserymen within twenty-five miles of their own locality and they will send to New York and Pennsylvania to get a little nursery stock that they can better buy near their own location, particularly small fruits, strawberries and raspberries.

The scope of the work in the Department of Entomology is rather varied, but the principal line, the relation of the insects to horticulture, agriculture and public health, the latter phase we are taking up in a rather strong manner.

The common house fly is one of the worst pests affecting public health and one that can be rather easily controlled if we understand the methods. It is only recently that the house fly has been regarded as the pest that we now know it is, and only recently that we understood the connection between the house fly and transmission of diseases. The house fly is the most filthy insect of any that I now recall; it breeds in common barnyard filth, walks over cesspools and immediately flies to our tables, wipes its feet on the food, baby's hands and face and thousands of millions of germs are distributed in that way. I go into hotels, into public eating houses, into country homes where the flies are literally swarming, and it takes away my appetite, because I undestand the nature and danger of the insect.

Nursery inspection has been somewhat of a bugbear to many people, that is, to those who had to be inspected. They thought nursery inspection was of little importance. There is a well known fruit growing section in our state where the people are almost entirely discouraged, ready to throw up their hands and quit, because they have so many insect pests and fungous diseases that are killing off their plants. Those people have avoided nursery inspection and really have broken the law. They have brought in infested and infected plants from other states and they have exchanged and sold among

themselves until the whole region is one mass of disease. I do not know but we will have to quarantine that whole section until things are cleaned up, but it only shows what will be done if we avoid all kinds of inspection. Further I find there is but one spray outfit in that entire fruit growers' region. I do not know how people can expect to grow fruit of a good quality without making the acquaintance of the spray pump.

The most important of the injurious insects affecting fruit trees is the flat-headed apple tree borer which affects trees recently set out; it lays its eggs on the outside of young trees. The larva hatches and bores beneath the bark. You are all familiar with the fine sawdust that it leaves. If you dig a little deeper and follow the tunnels of this larva, you will find a larva about three inches long. That fellow remains in there during the winter and hatches out in the following June to continue its work.

San Jose scale is a frightful pest; I found it in thirteen nurseries last year, but I am glad to say that we have been able to eradicate it from all but one, and I trust we will be able to eradicate it from that one this year.

On the small plants, the strawberries, we have had great complaint from cutworms, which is a fearful insect when it gets started, but it is not so hard to control. Take a pound of wheat bran, mix with a pound of Paris green, moisten with water and add some cheap sugar or syrup till it is sticky enough to hold together, scatter that about your infested plants along during the evening and the cut worms coming out at night will eat that in preference to the plants. Or you can spray with arsenate of lead and the cutworm will eat any foliage which is dying or wilting rather than standing crops. The raspberry cane borer is a common insect which has been abundant in the state this year.

You have noticed raspberries wilting and dying; if you will examine you will find a small puncture, generally two on a cane just near the tip of the twig, that is the egg-laying puncture of the cane borer. As soon as you find those wilting tips, cut them off and burn them. The leaf roller on the strawberry folds the leaf and fastens it together. Arsenate of lead sprayed on and kept on will control that pest. There was a man at Sparta last year who, if he had sprayed in the early

part of the season, could have saved his strawberries from the leaf roller, but he neglected to do so and now his strawberries are gone. The arsenate of lead must be sprayed during the growing season and during certain periods of the development of the insect, every ten or twelve days, because the new foliage pushing out offers a fine field for the young larvae.

Arsenate of lead in most cases is superior to Paris green because it adheres to the foliage longer than Paris green and will not burn the foliage. Insects develop more rapidly in warm weather than they do in cold weather and people in the North have fewer insects and fewer generations of injurious insects than farther South.

The white grub I want to mention, on strawberries, is another hard fellow to control, you cannot poison it because it never comes above the ground to feed. The white grub and cutworm are two insects we have to control by cultural methods, late fall plowing. If the white grub is bad in a field, do not plant strawberries next year and do not plant corn, because corn and anything of the grass family is the favorite food of the white grub. Put in some other crop.

Just a word regarding our new nursery inspection law. The nursery inspection law was modified somewhat at the last legislature. The fee has been reduced in some cases to cover the growers of small fruits, those who wish to sell strawberry plants and have less than five acres of plantation are charged only $5.00 instead of $10, as heretofore. It is unfortunate that we do not have inspection free, as in some states where the legislature makes provision for it. The law is more stringent regarding the issuance of licenses, it leaves the inspector to issue licenses. The fee is $5.00 instead of $10. Considering the slight expense of issuing the license, I think it is more reasonable. The inspector is enabled to revoke any license which he has given out for reasonable cause. Any misrepresentation of nursery stock which is grown or offered for sale as to variety or quality is a misdemeanor under the new law, so that we hope to put a stop to this miserable practice that Wisconsin has been subject to of agents coming in here and misrepresenting their stock and selling it at outrageous prices and when the trees come into bearing, we find they are seedlings, or some inferior stock.

Mr. Irving Smith: Do I understand that this nursery inspection law covers any one who sells a hundred strawberry plants to his neighbor?

Prof. Sanders: It is supposed to do that.

HORTICULTURE AT THE UNIVERSITY.

PROF. J. G. MOORE.

This seems to be a sort of symposium on the departments in the university which are more closely allied with the horticultural interests of the state. While teaching is a very important part of our work, it is by no means the only line in which we are trying to do something for the state of Wisconsin. Our organization is placed under three heads, exclusive of executive work:—instruction, extension, research and station work. Extension and station work come so close together that it is difficult to draw any hard and fast line separating one from the other.

We usually speak of teaching work first because it is a line of work in which we have a chance to meet by far the largest number of people who are particularly interested in the lines of work which we follow. The teaching work in the department is not an entirety of itself, that is to say, in the college we have no course, or so-called course in horticulture. Any one entering the university to take up work in the College of Agriculture is obliged to take other work besides pure horticulture even if he is desirous of taking only horticultural subjects. While there may be some slight cause for criticizing the organization along this line, nevertheless, those who have gone through a course at college realize that if the specialization is too close, the student is not so well fitted for the work in which he is interested when he leaves school as he would have been had he selected a wider course. We aim in the Horticultural Department to give a thorough course in different phases of horticultural work particularly along practical or applied science lines. Every student who takes a four year or two year course in agriculture and completes the course is required to take at least one course in horticulture. That course

we designate in the catalog as the "Principles of Fruit Growing." I do not know that fruit growing is any more important in Wisconsin than is vegetable gardening, but it seems desirable to give the fruit course as the one which our students should take.

Following "Principles of Fruit Growing" we have a course which takes up the field work and which goes into the details of some of the subjects touched upon in the first course, such as spraying, pruning, frost protection, and matters in connection with the actual operations in the field. Recently the university authorities have very kindly voted us sufficient funds to construct a new horticultural building in which will be located the Plant Pathology and Horticultural Departments, and in this building provision has been made for a spray laboratory in which the student will be given much more practical work than we have been able to give in the restricted laboratory space which we have had in the past.

In connection with the fruit growing course, we have what we call a course in Pomology. This line of work consists in the identification, judging, and packing of fruit as applied particularly to the apple. Along with standard varieties of fruit grown in various parts of Wisconsin we have fruit from Michigan, New York, Missouri, West Virginia and the western states for comparison, noting the differences in the same variety grown under different conditions and also specimens of commercial varieties grown in other sections, but which are not found in this state. By this method, the student after he has taken this course is able to recognize a large number of standard sorts. The work is quite largely confined to the apple because the college does not open until so late in the year that it is very difficult to have specimens of the small fruits with which to work. We do, however, have some work with plums, grapes, peaches and the quince. In connection with this work we are installing work in packing of fruit in the standard boxes because we believe that sooner or later some Wisconsin fruit will go forward in this sort of a package just the same as practically all the fruit of the western states does at the present time. This course does not consist alone of laboratory work, but also of lectures in which the student is instructed in the characteristics of the various species to which our common fruits belong, the relationship

and other points of interest so that a student who is going into experimental work or teaching work will know to what particular species the fruit belongs.

In the course in plant propagation methods of propogating fruits, vegetables, and greenhouse plants are dwelt upon and laboratory practice in the making of root grafts, top-working trees, budding and propagating by means of cutting and seed is given. In these four courses we have aimed to keep in mind the main points with which a student who goes out from a college of Agriculture will come in contact whether he goes into practical work or Experiment Station work.

Along vegetable lines our work is confined to two courses, one for forcing vegetables, and another a course in vegetable gardening. The outline of the work is very similar to that which I have discussed in "Fruit Growing." It consists in actual field operations in addition to the study of methods. It may be of interest to you to know that each of our students who takes a course in vegetable gardening is given a garden of his own. The student plants and cares for the garden as a part of his work up to the time that school closes in June so that he gets the practical work in the construction of the hot bed, in the care of the bed, laying out the garden, different distances of planting succession of cropping and all the various other phases which come into the actual operations in the handling of a commercial vegetable garden.

We also have some courses which we do not classify under any one particular line. As you all know, landscape gardening is a very important phase of horticulture and one which has not been as prominent in the past as it is destined to be in the future. The demand for landscape gardeners is greater today than ever before and so in the Horticultural Department we aim to give some instruction in this work although we do not plan to give a course which will make a professional landscape gardener. The course extends over two semesters and consists of learning to identify and characterize plants used for home ornamentation and for ornamentation of the city park. This is an important feature because no one can become a landscape gardener unless he knows something about ornamental plants. There is also a discussion of the care of these plants and their proper arrangement, grouping and planting around the house. After

studying the various plants with which he will have to work, the student is put into the drafting room and made to construct plans for different plantings.

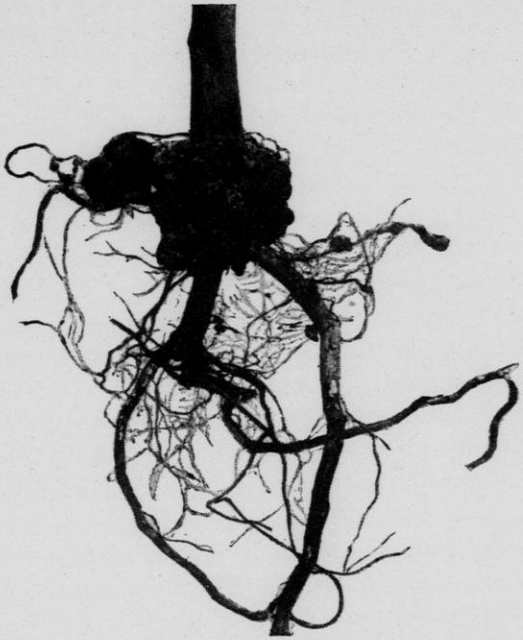
We also have a course in floriculture which takes up a study of the decorative house plants, a discussion of the landscape work around the home and then propagation of these various plants. Plant breeding also comes in for consideration. In connection with the Department of Experimental Breeding, we are giving a course in this subject so that the student may get the practical work in the greenhouse and orchard in pollination, emasculation, and various other phases of practical plant breeding work. The lack of time prevents my telling you what we are doing in the other lines of work which I mentioned at the onset.

CROWN GALL AND HAIRY ROOT.

PROF. L. R. JONES.

You have asked me to discuss the diseases of nursery stock. There are several upon different plants. The one deserving special attention at this time, however, is the Crown Gall and the closely related trouble known as Hairy Root and I will confine my remarks to this. Probably everyone here knows these troubles well but I have brought along specimens and photographs showing the various forms the disease may exhibit. (Apple specimens shown). On this small first year seedling tree is evidence of the beginning in the excessive development of films, roots along one side with some swelling. Should this root be grafted you will readily understand that a typical case of hairy root or crown gall would probably develop as shown in these two year old apples. (Specimens exhibited).

A comparison of these specimens will show all intermediate stages between the typical crown gall with hard knob-like swellings at crown or on roots and the typical hairy roots arising in tufts from a somewhat swollen place on the root. In other cases the disease may appear as swellings on the branches (apple specimen exhibited) perhaps as large as ones



Crown Gall of Apple.

A bad case on nursery stock. Note not only the large gall at crown but smaller ones forming on the fibrous roots. Such stock should never be planted; reject or burn it.—Prof. L. R. Jones.

Hairy Root of Apple.

This is on nursery stock from the same lot as the crown gall. Both are due to the same cause, parasitic bacteria and closely related diseases. All such stock should be rejected or burned.—Prof. L. R. Jones.

fist, studded with buds or slender roots, termed "hairy root." Similar galls may develop on the crown or roots or along the canes of the blackberry (specimens exhibited), upon which the disease is destructive. It also occurs on the raspberries, quince, peach, rose and other members of the rose family; upon various other trees and shrubs including the honeysuckle, willow, poplar, chestnut and walnut; upon various garden and field crops such as beet, salsify, turnip, parsnip, lettuce, red clover, hop, cultivated daisy, etc. While this is not a complete list, it illustrates the important fact that this is one of the most widely distributed diseases. It is of still more importance to know that the recent investigations of Dr. E. F. Smith and others have shown conclusively that this disease on the different plants is or may be one and the same thing and intercommunicable. While it is possible to have different types of gall disease, the common forms of crown gall and hairy root are unquestionably caused by the invasion of a species of parasitic bacterium (*Pseudomonas tumefaciens*). If this organism gets into the young growing tissues it there lies and multiplies and stimulates the diseased developments.

It has recently been shown to have disease characters similar to cancer in the animal body, although of course not identical.

The transmissibility of the disease from plant to plant should be accepted as settled. There remains opportunity for difference of opinion as to how much harm these galls do on certain plants e. g. in apples. Some claim them to be seriously harmful, others say they do little or no damage. The majority of practical orchardists, who have had experience with galled trees are, however, decidedly against the use of diseased stock under any circumstances. There is no difference of opinion, however, as to the harmfulness of the gall on raspberries and some other plants. Where the gall gets started with raspberry plants they may be rendered worthless if not killed outright.

Understanding that the disease attacks a wide range of plants including those of such important crops as the various orchard fruits, raspberries, blackberries, beets and clover and that it is intercommunicable from one to another, no one will wish knowingly to harbor it in his soil, much less buy plants which show it. It is therefore, clear that nurserymen should

co-operate with the State Inspector to secure and distribute only gall-free plants. If it costs more to do this let the price be made accordingly, the purchaser can better afford to pay a higher price for healthy stock than to purchase diseased stock at any price. Orchard planting is a long time investment and the earning of a few cents in price and accepting an inferior or doubtful tree at the outset is a short sighted policy.

Since this is a wide-spread trouble it is not easy to get rid of it entirely and no single specific remedy is known. In closing I will summarize the best suggestions that have been made for its control, based on the results of the studies by the experts of the United States Department of Agriculture, Doctors Smith and Hedgcock.

First: Strict inspection of nursery stock with condemnation of all diseased plants.

Second: Burn such diseased stock, preferably right on the field where dug.

Third: Use only healthy stock for propagation with care not to contaminate or infect them while propagating.

Fourth: Plant only in clean soil, where none of the disease has ever been known to occur, and rotate crops in the nursery, so that susceptible plants are not grown year after year on the same soil.

Fifth: Make close smooth grafts, using root and scion of as nearly equal size as may be, wrap with wax cloth or continuous thread.

Sixth: Propagate especially susceptible varieties by budding .

Seventh: Store grafts preferably in sand, and if period of planting is delayed beyond two weeks, hold in cold storage.

Eighth: Plant with union of root grafts 3 to 4 inches below surface.

Ninth: Be careful not to break or bruise callus in planting. Avoid wounding of young plants in cultivation.

Tenth: Avoid wet, heavy soils which increase the liability to diseases.

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

WINTER MEETING

MADISON, JANUARY 9, 10, 11, 1912.

TUESDAY AFTERNOON, JANUARY 9.

The Meeting was called to order by President Bingham at 2 P. M. in the Assembly Chamber, Capitol Building, Madison, Wisconsin. The President introduced Hon. James A. Frear, Secretary of State.

ADDRESS BY HON. JAMES A. FREAR.

Mr. Chairman and ladies and gentlemen of the State Horticultural Society: At the request of Mr. Cranefield, state horticulturist, I am pleased to say a few words of welcome to the men and women of your association who are doing so much to convince the world that Wisconsin is a fruit country second to none and with untold possibilities for the future. The Wisconsin fruit exhibit presented by Mr. Cranefield at Milwaukee during the state fair opened the eyes of all visitors to this fact and formed a basis for the prediction that in the near future Wisconsin will not only be known as the greatest dairy state in the country, first in many of the grains, hay, live stock, tobacco, sugar beets and

other products, but that it will also be known as the garden state of the Mississippi Valley competing on more than even terms with the great irrigation fruit projects of the west and the south.

I have been asked to briefly discuss a question recently presented by me at the National Irrigation Congress, held in Chicago and in doing so will briefly suggest that Wisconsin is just awakening to its own possibilities. Its progress in agriculture is due to the same spirit evidenced by the advanced ideals that have governed recent legislation in the state. While our national government has been advertising homestead lotteries, we in Wisconsin have been passed in the wild race for free lands, in the rush to new reclamation schemes, to the Alabama pecan groves, to Florida everglade propositions, to Oregon apple orchards and to the vast, treeless, cheerless plains of Canada, all invitingly portrayed in alluring literature that attracts the guileless and unsophisticated.

During the past we have modestly hidden the light of our state under the bushel but we are now challenging comparison with one and all of these districts and believe that here will be found more favorable conditions than can be had with any of the various propositions mentioned. We believe the possibilities of successful farming are better today in Wisconsin than in any other state or country. Favorable conditions of climate and markets we have long possessed, but a movement is now on in Wisconsin that reaches out a helping hand to the individual farmer teaching him the best uses of the soil he is cultivating, the value of good seeds, the most approved methods of farming and finally we are studying business accounting on the farm, the actual cost of producing crops and stock with the expectation of presenting a co-operative scheme whereby farm products may soon be sold with less loss and waste.

Our markets are unequaled, for Wisconsin is in the heart of the most populous part of the Mississippi valley, surrounded on the north, east and west by the greatest lakes and river in the world, affording cheap transportation to the southern and eastern markets. Duluth, Superior, St. Paul, Minneapolis and Milwaukee are distributing points for millions of people while Chicago, the greatest grain mart in the

world close to our southern border, absorbs all of the products we can raise. Fifteen millions of people are today within the states bordering on Wisconsin and nearly one-half of all the population of this country is to be found within the states directly reached by our waterways.

In markets, water, climate and soil we challenge comparison. Flax, barley, oats, corn, and even wheat grow as well or better in Wisconsin than elsewhere. We have few competitors and no superiors in the field of agriculture. Our exhibits sweep the boards wherever contests are to be had—a high testimonial not only to the soil which produces the crops but to the energy and intelligence of those who have raised them. The Hood river valley and the North Yakima valley never offered better fruit than Bayfield, Waupaca, Door, Chippewa and other counties in Wisconsin have produced during the past year, while the frost on the pumpkin and on the apple has given to the Wisconsin product a flavor that can never be duplicated by the western fruits with which we are ready to compete. Clover and hay grow everywhere in northern Wisconsin, in the field, among the trees, along the roadside and when put into cows it returns to us over $80,000,000 annually in dairy products, making ours the greatest dairy state in the country. We can profitably grow everything, from barley and beans to peas and pickles, from cattle and cheese to timber and tobacco. We raise the finest cherries, strawberries, apples and grapes that are placed on the market, just as we have distanced Virginia and Kentucky in the production of tobacco per acre.

Poor land is to be found in Wisconsin, but millions of acres of good soil is yet undeveloped, as rich in fertility as land found in the older sections of the state and to be had at a nominal price.

This is briefly the message I would give to you. A quarter of a century hence Wisconsin will remain the great center of dairying and other pursuits, surpassing all other countries as it does today, because the conditions of climate, soil and intelligent methods of farming and stock raising within this state, leave us without a competitor.

There is no other state or country which offers equal agricultural or horticultural opportunities when these facts are considered.

Contentment and happiness is brought about by social conditions, by churches, schools, the social center and all the conveniences of mail service that come to the settled communities we have in our state. Locate a Wisconsin farmer in Alberta, fifty miles from a railroad, and life is indeed miserable. Give him all the splendid home making opportunities to be found in the old Badger state and he is the most independent and contented man that can be found in the country.

It has been well said that when agriculture ceases to attract men to the field, the nation will become weak that has to depend on other countries to supply its necessities. There is no easy road for the lazy and thriftless man, but for those willing to work, to the man who is searching for the land of promise and who would find a home among a strong, progressive, Christian people where the spirit of co-operation and helpfulness is extended, there is no place today where opportunity is greater than in Wisconsin. It invites those within its borders to become acquainted with these conditions, holding out its hands with equal hospitality, to those who come from foreign climes.

THE NEW ERA IN WISCONSIN HORTICULTURE.

By W. H. HANCHETT.

(Paper read by Secretary.)

That we are just entering a new era in horticulture in this state is very apparent to all who have been taking note of things doing in the horticultural line throughout the state, during the past two years. The dividing line has been sharply marked and unmistakable to even the most casual observer. The horticulture of the past has been experimental to a great degree, bringing many disappointments with just enough rays of hope interspersed to keep its devotee enthralled and everlastingly at it. The horticulture of the present is an attractive business venture with well defined areas of suitable locations, and well established guideboards of experimental knowledge pointing out the way to success.

The horticulturist of the past was looked upon as a sort of fanatic, afflicted with a harmless form of lunacy. Today we honor him as a sturdy pioneer whose persistent experimental work has made *horticulture in this state an attractive business venture,* while we look upon the horticulturist of the present as an enterprising business man of a high order of intelligence.

As the past has been an era of experimentation, so the present is an era of rapid development and when we look around and see with what energy development schemes along horticultural lines are being pushed, we can readily understand that we do not concern ourselves as to means of accellerating the movement but are made to feel that there is great need of strenuous efforts on the part of the Wisconsin State Horticultural Society to make it an era, not only of rapid development, but an era of sane and businesslike development as well, else we shall fall on evil days.

Right here I wish to quote a few lines from a popular author:

"He who lives within things can never worship in truth"
"Eyes blinded by the fog of things cannot see truth"
"Ears deafened by the din of things cannot hear truth"
"Brains bewildered by the whirl of things cannot think truth"
"Hearts deadened by the weight of things cannot feel truth"
"Throats choked by the dust of things cannot speak truth."

How vividly a picture of earlier days, when I was a young man just attaining my majority, comes to me at this time. I had been an experimenter in horticulture from boyhood days. I was casting around for a business opening when the president of the Wisconsin State Horticultural Society, as a farm institute lecturer, was telling the people of the state that there was no danger of overproduction of fine strawberries. How eagerly I listened to that statement! How I wished to believe it! Why? Simply this; I was an experienced strawberry grower and knew I could raise large crops of fine strawberries and if this statement was true I knew I need look no further for a business opening. I knew something of markets but had some troublesome doubts as to their limits and the danger of overproduction. I was between the two fires, of hope inspired by the president's assertion, and of

despair inspired by my own doubts as to the extent of the markets. Hope said, "The president is a man of business experience beyond your years. His judgment should stand without question," and held up illusions of a happy home over which I, surrounded by loved ones, should preside. Doubt said, "The president's statement will only lead others to take up strawberry raising and hasten the day of glutted markets and calamity, and if you plunge in it will put an end to all your visions of home and loved ones."

In my perplexity I did what I have since learned was the only sensible thing. I wrote to the leading commission markets and a few of the leading country towns for estimates of the number of cases of strawberries that their trade would take at certain prices. When I had heard from all I found that estimates from different towns tallied so nearly with their population that I became convinced that they would make a safe basis of estimate of what the consumption would be in the territory within my reach. This I used with the census report to form an estimate of how many acres of strawberries it would take to supply the territory at prices which I considered satisfactory. My estimate was that 300 acres producing such crops as I had been able to produce would supply all the markets within reach from Sparta. A few years later Sparta alone came into the market with 600 acres and many competing towns had sprung up. The result is a matter of history. The strawberry crop was allowed to rot on the ground unharvested. The only satisfaction I got out of that year's business was to know that my pencil did not deceive me in making an estimate and that strawberries were so cheap that people got the strawberry habit which has worked to the advantage of strawberry growers ever since.

I mention this only to illustrate that there may possibly be a perfectly sane and cold-blooded business method of gauging development in any horticultural line.

If you will but take the time to examine the collection of prospectuses, issued by various real estate concerns, which Secretary Cranefield has in his office, you will agree with me that we are in the midst of things horticulturally here in Wisconsin and the all important question before us is: Shall we allow our eyes to be blinded by the fog, our ears deafened by the din, our brains bewildered by the whirl, our hearts dead-

ened by the weight and our throats choked by the dust till we can neither see, hear, think, feel or speak the truth.

Here we may well ask what is the *truth*? Where may we find it? How may we separate it from the fog and din and whirl and dust that is being kicked up by the professional promoter and the real estate shark?

Fortunately we have with us today representatives from several sections of the state who are so closely connected with horticultural interests in a business way as to qualify them to give us much plain unvarnished truth from their respective sections of the state. Let us ask Mr. Richardson of Sparta whether or not there is room for further development along horticultural lines in his section and if so whether he wishes to see development by the nonresident investor through the good (?) offices of the professional promoter or development by the home builder who wishes to establish a home and obtain a livelihood as a horticultural specialist. Let us ask Mr. Kern of Bayfield and Mr. Bingham of Sturgeon Bay and others prominent in horticultural work these same questions and then let us investigate the nonresident investor development of the Bitter Root district and some of the other western sections following this plan and compare it with the Minnetonka district in Minnesota with its resident development, small holdings and happy homes, and I think we shall have no trouble in deciding which plan for development we ought as a society to encourage.

It is however a fact that the argument may be truly used that the professional promoter will develop much more quickly the orchard possibilities of any section but let us stop to inquire whether even this is desirable.

Estimates from reliable sources place the acreage planted to cherries in the Sturgeon Bay district at from 2,000 to 3,000 acres and reliable parties who have been watching development in that section predict that this will be raised to 10,000 acres within a very few years. We are told also that the present bearing acreage is about 40, from which the very handsome returns received are being flaunted by the professional promoter before the dazzled eyes of prospective investors as an example of what they may receive if they will only sign a contract with them for a 10 acre orchard which they are able to show them with their pencils will bring in a hand-

some income for old age and retirement. How illusive is the inducement to the man working on a moderate salary! A compensation or income for the retirement of old age. Ah! That has been a perplexing problem with him for some time. Here is its solution and how easy that company of promoters are going to make it all. Just the signing of a contract, the payment of a few dollars per month and presto! The perplexing problem is solved.

How quickly it causes the fog to raise before the eyes! How quickly the din of it deafens the ears! But before we allow the whirl of it to bewilder the brain, let us use a small grain of sense and businesslike precaution and make some inquiries. Let us ask the representatives from the Sturgeon Bay district what in their opinion will be the effect of multiplying their present output by 250 or even 100? In their opinion will it be possible to obtain sufficient help to harvest such an output? Will it be likely that transportation facilities will be sufficient to handle it if harvested? And will markets at profitable prices be found for such an increase? Let us have estimates from them regarding the number of times their present output can be multiplied with safety to the investor. Let us ask these same questions of representatives from the various other fruit producing centers, regarding the particular line of production of their section. Let us insist on well considered answers, and then let us get the information thus secured tabulated in shape for distribution to the inquiring public that they may know the approximate truth and use it for their guidance and protection.

Some may object that such a course will check development and all will agree that rapid development at this time is desirable, but I think most of you will agree with me that the most substantial development will come from letting the unvarnished rays of truth so direct it as to keep production and market demands nicely balanced by pointing out those products of which there is an underproduction, developing ways of widening our markets and stimulating consumption, thus making room for a rapid and natural increase in horticultural production and thereby building up happy and prosperous rural homes and making this an era of rapid and businesslike development of horticultural interests in this state.

The President: We will stop a moment for discussion, this paper ought to be thoroughly discussed.

Mr. E. A. Richardson: While I am fully in sympathy with Mr. Hanchett's paper with regard to the advancement of any community under the orchard promotion system, yet I think that the building up of small homes and individual ownership of fruit farms is better, a more substantial development.

The Secretary: Mr. Hanchett asked the question if in your opinion you would be justified in planting 300 acres more of small fruit in the vicinity of Sparta?

Mr. Richardson: I think we would be justified in planting out 300 acres more, or in doubling our output of the present time. While we have been shipping fruit from somewhere in the neighborhood of 500 acres, we think we could easily market fruit from 1,000 acres. The only point would be in the distribution of the product, and we have found in the marketing of fruit that we would have been able to market fully twice as much as we have been marketing.

The Secretary: Is there any representative of co-operative orchard ventures here who would be willing to speak on this subject? You see Mr. Hanchett in this paper raps at the development along the line of company promotion schemes, standing strongly for individual development. Now, we ought to have all the truth. He asks here for the truth. We have in the state several companies who are promoting fruit growing on a large scale by co-operative methods.

Mr. Richardson: I do not think Mr. Hanchett in his paper intended to criticise co-operative fruit raising. I think he intended to disapprove of the practice of a company getting together, buying a certain number of acres, 50 or 100 or 200 or more and then selling it out to people who are not in a position to care for it successfully.

Mr. Toole: I do not think that we want to discourage what may be done in the line of promotion by companies, whatever we may choose to call them. I am glad that we look forward to booming Wisconsin as a commercial fruit growing section of the United States, but of still greater value to the State of Wisconsin will be that feature of fruit growing that makes people believe more in the state and still further, make people believe outside of the state, that fruit growing in Wisconsin is so far advanced that it adds to the attraction of our home

and makes Wisconsin the great home state, because we can, if we choose, grow very fine orchards, which some day will be equal to those grown in the west.

Mr. M. S. Kellogg: The question of development of horticulture in this state through co-operative concerns is one that is somewhat like the development of a country through some co-operative real estate company that buys up a few thousand acres of land, sets out trees and unloads it on some poor enthusiasts who do not understand the business. The men who have built up Wisconsin in the past are the men who have carved horticultural results out of the hardships that they have endured, and it is only through the individual work and it is the individual behind the horticultural work that is going to count. It is not any company, and you cannot get results from co-operative concerns that you get from individual efforts, I don't care what sections of the state you work in. You will find that is true in horticulture as well as all other work.

The Secretary: There must be somebody here to speak from the co-operative or promotional standpoint.

A member: Mr. Bingham.

The President: I do not know that I can add anything to what has already been said: I know that it is a big problem and whether it has been fully worked out satisfactorily I can hardly say. I know that supply and demand is a great factor in the production of fruit; whether that will be overdone I do not know. That only remains to be proven. We do know this, that to a certain extent the sale of fruit is considerably helped by the production in any locality of sufficient amount to interest the buyer, to interest people to come to that section to buy fruit. To what extent this can be carried on, of course, has to be determined, and perhaps will be largely governed by the amount of energy put forth in the line of marketing. It would probably depend a great deal on the kind of fruit we grow. A perishable commodity like the strawberry could not be shipped and marketed in as wide a range of markets as some other kinds of fruit and naturally would result in a glutted condition of the market in certain sections and in certain localities. But in other classes of fruit, the apple in particular, I think there would be perhaps less danger of overproduction by large planting, from the fact that the apple is a

class of fruit that can be held to some extent, marketed in more of a moderate way, and not put upon the market in large quantities, thus forcing down the price. We have no representatives here today of the co-operative orchard men; I should have been glad to have had some of them here and take up this subject from their point of view.

Mr. Pellett: There are two different plans of co-operative fruit growing. One is that of the professional promoters who buy a lot of land with the idea of selling it out on monthly payment plans to clerks in cities who are drawing $15 a week salaries, who know nothing about fruit growing and expect to get rich quick. There is another class which is being developed by fruit co-operative enterprises that have considerable capital invested. The work is placed in the hands of competent managers and the whole scheme is really a profitable venture. If it is profitably managed the one will perhaps add to the possibilities of the fruit growing region, while the other will soon just be growing up to a waste of weeds and dead and dying trees and will rather tend to discourage further development in that section. As far as overproduction is concerned I do not think we need to have any fear of that, once we master the subject of distribution. But when fruit is rotting on the ground in one section, in other sections not far away there will be an actual dearth of fine fruit, so that the main question in that respect it seems to me is to work out some plan by which we may distribute the product on very short notice and in good condition.

The Secretary: It is not my practice, as most of you know, to take any active part in discussions; I do not propose to do so after this session, but this is a subject in which I am very much interested. For years I have spent some of my time and considerable of my energy in the attempt to combat or overcome, I may say, the efforts of the western orchard growers in getting Wisconsin capital and Wisconsin people involved in orchard enterprises or promotion schemes. I continued along that line with more or less success, rather less than more. The time soon came when development along commercial orcharding lines in Wisconsin was of importance. Just as soon as commercial orcharding came to be recognized as one of the industries of the state, behold, we had with us in our midst some of the plans that I had been fighting for years. There

are three or four different plans for development. One is the plain stock company, for which I have the highest respect. Another is the corporation, or company organized to sell acre shares of orchard, for which I have less respect; the third is the pure promotion work for which I have absolutely no respect. So far as I have any knowledge, we have none of the last named class in Wisconsin. If there are any companies organized for the purpose of fleecing the people, I do not know of them. If you know of any, I wish you would let us all know. We have in "Horticulture" a medium through which we can give them the proper kind of advertising. We have, however, a large number of stock companies of the second class mentioned. They are working toward horticultural developments, they are developing the fruit business beyond any doubt, they are doing it on a safe, and I may say a sane and honest basis. I have investigated to some extent the methods by which these companies are doing business, and I am willing to speak a good word for all of them that I know about. But still, the question is always before us, is that the best basis on which the fruit growing and horticultural interests of the state are to be developed?

That is the question asked in the paper. Shall we encourage the planting of hundreds and hundreds of acres in one block, increasing wonderfully the development of fruit growing, or shall we give it less encouragement, and give our greatest encouragement to the individual holder, the individual planter, the home owner and home maker? I am not going to conclude my argument on that point. This is one of the most important things that faces us today: Shall we, as a society, give our encouragement to "promotion" schemes, shall we discourage them or shall we encourage the individual planter on the small scale?

MARKETING THE APPLE CROP.

A. K. BASSETT, BARABOO.

After carefully pruning, spraying and cultivating an apple orchard, this all important question arises: "What is the best method of marketing the crop? When we buy spray mater-

ial, farm machinery and labor, we are asked to pay a fixed price, but when the majority of apple growers wish to dispose of their crops they consign their produce to a commission house and accept what they are willing to send in return.

Sec. Cranefield states in the last issue of the WISCONSIN HORTICULTURE that we ought to assassinate the dishonest commission man. At that rate they all ought to be assassinated. It has become second nature for them to be dishonest. In the first place there are too many of them and in order for them to live in the style they do, it is necessary for them to make false reports. Last summer several stopped at my place as they were making a tour in their automobile from Chicago through to Minneapolis. They looked over my orchard and showed me how to grade fruit, and said that most of my apples would go as first class. Most of the returns I got showed that they sold for cull prices. If they did sell well, they took out a little extra for handling them. On one occasion I wrote to find how the extra charges came about. They sent me a nice letter saying that this was a choice car of early apples of which they had more or less trouble in making disposition. They sent me a list of charges which showed $30.75 extra for icing and demurrage.

Why not eliminate the commission man and sell direct to the retailer and consumer? The large grower and the fruit growers association can probably do business with the commission house, but it is from the standpoint of the smaller growers that I wish to speak.

I consigned the bulk of my early apples to a commission house and, receiving very poor results, I began to look around for trade of my own. I began by placing a small advertisment in my local paper, stating variety and price. This brought greater results than I anticipated. I received orders from many parties who had once lived in the vicinity of Baraboo, but had moved away and took the local paper. From one party I received the fourth order and could have sold them more if I had had the apples to spare. Several persons from the city, while visiting in Baraboo, saw my advertisment and ordered some sent to their homes. One Chicago lady ordered two barrels of early apples, and as soon as she got home she sent me an order for ten barrels more for her neighbors.

Through Baraboo people I shipped many apples to parties living in the Dakotas, Minnesota, Utah, Colorado, Michigan and Illinois. Only a short time ago one of our leading dentists sent a box of my Snow apples to Los Angeles, California, and word came back that they arrived in fine condition and the man said that he would be sick if eating too many apples could make him so.

The majority of my orders, however, came from the northern part of Wisconsin.

Many summer visitors from Devils Lake came up during the summer and, seeing fruit which they declared was far superior to any they could buy in the city, left orders for a barrel or two to be shipped as soon as they went back, and later ordered some for the fall and winter. This was at the time when the commission houses reported apples a glut on the market and sent very poor returns. Yet these people declared the cheapest apples they could buy were 40 cents a peck.

Then, too, I had letters from a great many grocery and fruit dealers from the small northern towns. To several I sold apples right along.

After getting started in selling direct to consumer and small retailer, I was able to dispose of the remainder of my crop and could have sold the quantity many times over. I did not get four or five dollars a barrel as some folks did that we read about, but I sold from $1.60 to $3.00 per barrel F. O. B. at Baraboo, according to variety. And this, considering last year's yield, is very good money. Money talks, yet the letters I received from satisfied customers, were encouraging. This is the way they run:

November 17, 1911.

Mr. Arthur Bassett,
Baraboo, Wis.

Dear Sir:—Apples rec'd. in fine condition, as fine a barlel of Fameuse as I ever saw. We are certainly enjoying them. Enclosed find money order for $3.00. Many thanks for your trouble.

Respectfully yours,

C. C.

Marquette, Mich., November 8, 1911.

Mr. A. K. Bassett,
Baraboo, Wis.

Dear Mr. Bassett:—

The snow apples were duly received. They are the finest snow apples I ever saw—thanks.

Inclosed please find a $4.00 check for same.

Very truly yours,
G. W. D.

In contrast let me read you one from a commission house:

Chicago, Ill.

21 Bbls. Apples

Received 9–5–11

For Acc't of A. K. Bassett
Baraboo
Wis.

7 Wealthies	$1.25	$8.75	
3 Cooking	1.25	3.75	
1 Sweet		1.40	
4		6.25	
6 Blush decayed		2.50	
			$22.65
loose pack no face			
Freight		$7.82	
Commission		2.27	
Cartage		1.05	
			11.14
E. & O. E. Net proceeds			$11.51
Remarks: Price for 21 bbls			8.40
21 bbls.			$3.11
Per bbl.			.15
Per bu.			.05

About this same time I made a shipment of the same variety to Hillsboro, North Dakota, which were ten days on the road, and another to Hooper, Colorado, which traveled eighteen days. In both cases word came back that the apples arrived in fine condition.

I am so well pleased with the success I had in selling direct to consumer and retailer that hereafter I intend to dispose of all my apples in this way.

The location of Wisconsin makes it an ideal place in which to market a crop in this way.

The freight rates on a barrel of apples from our station to any point in the state is not over sixty-six cents, thus making it possible for a consumer to get apples at picking time

for $3.00 or less, which is a very moderate and satisfactory price and leaves the grower a good compensation.

In the northern part of the state, where there are thousands of apple-hungry people, few apples are raised, and retail prices are never lower than thirty-five to forty cents a peck for cull apples. At least that is what residents of those parts tell me.

From past experience I know a good many apples could be disposed of to the working classes living in the factory towns near the large cities. These people, like those living in the northern sections, would consume more apples if they could buy them for what they are worth.

I think if one wanted to make a specialty of selling fancy fruit they could find a ready market for them in the large cities.

If anyone has an orchard located near a city of some size, he can dispose of a great many by peddling them. An aristocratic grower might consider this method beneath him, but it is an honorable business, also a money-making project. I sold practically all my late fall and winter varieties in my home town. I deliver them by the bushel as my customers wish them, thus saving the cost of the barrel, which pays for delivering. I find that people would rather buy a bushel at a time than a larger amount. I have many customers who use from three to four bushels a month. This goes to show that people will consume more apples if they can buy them right. I notice that it is the people of moderate and ample means who buy the most apples. The rich people usually wish to purchase about ten cents worth, and of course such trade is not worth soliciting.

Many persons say to me, "I don't see where you sell your apples, I can't sell any." My one answer is "Have the right goods and then advertise."

When my young orchard gets into bearing I intend to advertise on a large scale. I shall place advertisements in the local papers of some fair sized northern towns, stating grade, variety, freight rates and price. I think it is very essential to state the price, as the majority of people do not care to bother about writing for prices. If the price suits them and the fruit is guaranteed, they are quite likely to send a trial order.

A Wisconsin farm paper is also a good place to advertise in, thus getting in contact with farmers who do not raise apples.

I spoke before of the chance of selling extra choice selected and packed fruit in the large cities. For this purpose I would advertise in some magazine likely to be read by the moneyed class. I ran across an article awhile ago about an eastern grower who made a specialty of doing this. This is the way it reads:

> "HAVE YOU A HANKERIN' for those firm, sweet apples you used to knock off the tree with a club when the old man wasn't looking? That was back in the days when the East—the natural apple country— was producing bumper crops. It was before the days of Oregon apples that have size and color, but lack the real flavor of Eastern hillsides. I have rejuvenated a Vermont orchard and will have for October delivery a limited quantity of apples that are just a little the best that can be grown. Drop me a card for the particulars."

The grower ought to place "catchy" labels, containing the farm name and location, on the barrels. This is the modern way of advertising and is extensively used by manufacturors of food products. We are all familiar with the brands—None Such Mince Meat, U-need-A Biscuit, etc. Fruit shipping associations are now falling into line. They are adopting brands which are trade-marked and are advertising them to increase consumption of their fruits, and I think it would be profitable for the small grower to do likewise.

But lastly, and most important of all, one must guarantee the fruit. The recollection of quality remains long after the price is forgotten. If I get a letter with the money in it, I send that man just as good apples, and maybe a little better, than I would the man who pays after he gets the apples. Send a man as good apples as you guarantee and he will tell all his neighbors and friends and you get *their* orders, but send him poor apples and he is lost forever.

It seems to me that here is an excellent opportunity for a young person to enter a new field of work. It will take a few years, of course, before a brisk trade can be established, but

remember this always, that unless one sends a customer apples of quality, you are killing trade. It is the come-back order we are after, and a customer will not come back with a second order unless he gets what he wants.

At present at least, there is very little competition in this line and the time is fast approaching when the middleman must go.

Mr. E. A. Richardson: I should like to inquire how large a crop Mr. Bassett had?

Mr. Bassett: I have at present about 500 trees, scattered over 12 to 14 acres. I expect to plant about 100 acres.

Mr. Richardson: How many barrels of apples did you market this year?

Mr. Bassett: In all about 800 barrels.

Mr. M. S. Kellogg: I should like to ask if Mr. Bassett packed any in bushel box packages?

Mr. Bassett: I shipped in barrels, practically all, except once in a while I had an order come for a box to be shipped to friends by express.

Mr. Richardson: Did you ship mostly by freight, or by express?

Mr. Bassett: All my fruit went by freight.

The Secretary: Do you find a demand for boxes?

Mr. Bassett: I think the patrons I have been looking for in our own part of the country, factory towns, prefer a barrel. One has to have more money for a box package. It is generally understood that the box apples are a little better than the barrel apples. If you are going to handle box apples you have got to use more care, it costs more to do it.

Mr. Rasmussen: I think Mr .Bassett is a little too severe on the commission men. I have found some crooks also among consumers.

Mr. Richardson: I think Mr. Rasmussen is all right. You will find good straight men among the commission men. Of course there are some that are pretty sharp, working for their own ends, but from my experience I will say, there are some good, straight, honest commission men.

Mr. Bassett: There are exceptions to all rules. But if there are ten per cent honest commission men I never got acquainted with them. The only way a little fellow can fix a commission man is to ship him 25 to 30 barrels and tell him

you have about 1,000 barrels, get him to pay a satisfactory price for them and then ship to another fellow.

Mr. Rasmussen: Ship your goods all to one good firm, guarantee every package, stand by it. I find that is the best way.

Mr. Bassett: That is what I advocate doing. If I can get a good retailer they are all right, but there is no use putting an extra price on them. I can sell them all right to the consumers, do my own commission business as I get a trade worked up. The fruit will go to the consumer for less money and you will have more.

Mr. Rasmussen: I think the commission man can handle them on a cheaper scale than we can. We have got to have a middle man.

Mr. Bassett: Then I would be my own middle man, if I were selling direct to the retailer. I would like to ask Mr. Richardson if they don't sell to the consumer? Couldn't I do that just as well as the big man?

Mr. Richardson: Yes, we sell a good many cases of strawberries, raspberries, small fruits and apples to consumers, but we still use the commission man, we cannot get along without him, because some days we will have more than the local trade will take care of, and we have to send our surplus to the commission man. We find this, too, at the commencement of the season, if we get a good commission house they expect us to furnish them through the season, every day. They are working up their trade just as you have worked up your trade and they have got to supply their trade, and they are looking to us to supply that trade. You will find that you will get some very good commission houses that way. We supply them every day, and also supply the local trade.

Mr. Bassett: That is what I said, the fruit growers association can do that; you have some idea as to what you are going to get for those varieties when you ship them to the commission house.

Mr. Richardson: Yes. About six years ago I had a local order trade myself, and we used to ship our surplus to the commission house and we found the same thing there. If they knew stuff was coming in every day, knew they were going to get goods, they would do the square thing, but if we shipped today and did not ship any tomorrow, they could not depend on what was coming, they could not depend on getting the

goods to fill the orders for their customers, and consequently we might not get the prices that we ought to have had for that shipment, for the reason they had ordered goods from some other place. I do not think that commission man is dishonest, because he does not know what to expect and he gets all his trade can stand on that day. That might have been the way with your apples, they went into the market when it was overstocked, and if there was only one car he could not get a better price for it.

Mr. Palmer: I have had considerable experience with commission men and I have found there are honest commission men, I believe just as honest as there are shippers. I have found a great deal of trouble handling apples with bad packing, and I find very few men who pack apples so that I dare put my own in and accept their pack. I have talked to a man in our town who handles a good many more apples than I have, and he said of all the dealers he has not found one that he has dared buy apples from without change of packing. If we pack good stock and ship to good, honest men, such as I know there are, we can get pretty satisfactory returns, take the season through. We can take out individual shipments that we do not know where to put, that we ought to dump to get rid of, that we do not get good returns for. But take the average sales all the way through, I think we have done pretty well with the big crop that we had to handle. That has been my experience.

Mr. Kellogg: I should like to ask Mr. Bassett if he kept any record of the cost of advertising and working up this direct-to-the-consumer outlet for your apples? Can you work up a trade of that kind, say covering a period of five years and do it on the same percentage that you can sell your apples through the commission house?

Mr. Bassett: I think you can.

Mr. Kellogg: That is not figuring any shortage for spoiling of the fruit in transit; that you have to take your chances on in sending to the commission house. But I have an idea that while you may be able to dispose of from 800 barrels possibly up to 1,500 barrels readily through a direct-to-the-consumer method, if you had 2,000 or 3,000, or at the outside 4,000 or 5,000 barrels to dispose of it would be pretty hard to sell those apples direct to the consumer without the aid of the commis-

sion man. I have had some little dealing with commission men and it has been my experience that there are honest commission men and they will deal fairly with you if you will put up goods in nice shape and they see that you are ready to stand back of them.

Mr. Palmer: We have tried both the commission house and the man that Mr. Bassett speaks of. The regular commission man who does simply a commission business is the man to ship to. The man that comes to buy, sometimes makes you a good price, but if you ship to one of those men that buy a certain amount and also sell on commission they sell their own apples first.

CO-OPERATIVE MARKETING OF FRUITS.

BY HON. P. A. ROGERS, GRAVETTE, ARK.

(Paper read by Secretary.)

The co-operative marketing of fruits by the grower rests upon the sound and fundamental principle that in union there is strength, and as developed in this country, is the outgrowth of necessity, for the growers in many communities have found that they must hang together or else they will hang separately on the ragged edge of want. The rapid growth of the fruit and truck industry of recent years has been the outgrowth of conditions and developments that have occurred in other directions. Without the marvelous extension of our railroad systems to every quarter of our country and without the refrigerator car, we cannot conceive of the fruit and truck industries as more than local enterprises, and then the people of each community would only enjoy such vegetables and fruits as could be produced in their own locality, and in these they would be limited largely to the season in which their products grow. But with the railroad and refrigerator car, the people in every section of our broad land, embracing, as it does, every variety of soil and climate, can and do enjoy the wide variety of products of every other section. Today in Madison, with the mercury playing around zero for weeks at a time, you may enjoy your oranges for breakfast, you may have your bananas, you may have your lettuce, celery, rad-

ishes, and other vegetables, fresh from the gardens of the south; and if you have an appetite for it and your purse is long enough, you may have strawberry shortcake. With the first appearance of spring here, you may have watermelons from Texas, Florida and Georgia. Before your strawberries begin to bloom, we are shipping you the famous strawberry of the Ozarks. This change of conditions has revolutionized the business of fruit and truck growing in this country and with this change has come, necessarily, an entirely different method of marketing. Where fruit and truck are grown only for the local market, the grower is necessarily his own salesman. He collects his products, hauls them to his nearest market, and either retails them to the consumer or else sells them to the retail merchant. In this case, the growers' market is limited at the outside to the distance he can transport his product with a wagon and team. But the railroad and refrigerator car have given him, it matters not though he live in the most remote corner of the country, the United States and Canada for a market. For instance, the grower of strawberries in the Ozark section picks, packs and hauls his berries to the shipping shed. He can follow them no further. They may go to Denver, they may go to Winnipeg, they may go to Buffalo, or to any one of the hundred points that his berries reach as a market, but wherever they may go, he can see them no further than the car. This, then, calls for a method of marketing different from that which would prevail if he could find a market in his nearby town. Here will you allow me to trace the evolution that has occurred in the marketing business of the fruit and truck grower. Go with me to a new country, where the sound of the locomotive whistle has never been heard. The people are a simple, rustic population. Here and there is a country store, where the frugal housewife may exchange her surplus butter and eggs at a ridiculously low figure for such merchandise as will meet her simple needs. The county seat, fifteen or twenty miles away which may be visited once a year, to the rustic is a kind of metropolis which he describes with pride and may be with some arrogance to his admiring household. The farmer here grows the ordinary crops in measure sufficient to meet the needs of a family familiar with the simple life. At length a change comes. The precursors of the railroad make their ap-

pearance. The county paper has in its weekly issue columns devoted to glowing accounts of prospects of the railroad that is to go through the county. Then follow the agents who are to locate the right of way. Enthusiastic railroad meetings are held, subsidies are raised along the competitive routes; the route is at length located. After great efforts to raise subsidies, townsites are located. Then comes the construction, then the first train and the celebration along the line at the various stations. Everybody will now be rich. No more long trips with wagons and teams. No more journeying for days over rough roads in wagons or carriages to visit distant relatives; life will surely now be easy. But matters finally settle down. The people come down out of the clouds and get down to everyday business. They soon learn there is something for them to do. Then the transition from old methods to new begins. Some enterprising farmer concludes he will depart from the ways of the fathers. He will embark in a new enterprise. He will try planting a plat of strawberries, early potatoes and a quarter of an acre of tomatoes, may be some beans or peas, for shipment to his nearest city market. The venture proves profitable beyond his highest expectations. It is too good to keep. He tells it to his neighbors and reports it to the county paper. Next year everybody in this neighborhood follows the example of their enterprising neighbor. They are successful. The example is contagious. The next year the farmers at a dozen stations fall in line. Up to this time, every man ships independently and by local express as nobody grows largely enough to load in cars. Soon the markets that can be reached by local express are swamped. Everybody loses money and the business is near being abandoned; but it is suggested that if the growers will load together and load car lots, that they can reach much more distant markets. This is done. Profit is again received and a new impetus is given to the industry, and it continues to increase. Thus you have the organization of local associations. These local associations are formed throughout a whole district, covering a wide territory, and become active competitors of each other in the various markets that they all reach. the result is disastrous. There is no concerted action among the various associations. There is co-operation among the individual members of each association but ruinous competition

among the local associations themselves. Results again prove unprofitable. Not only is there destructive competition among the local associations, but, there being no concerted action among them, there can be no intelligent distribution. Some markets are glutted, others are neglected. The results received are such as would be expected to happen from such unwisdom. This condition cannot long continue. It must be changed, or the business will languish and soon be abandoned. After repeated efforts, attended with disappointment and failure, at length an organization of the local associations is formed. They establish a selling and distributing agency, whose business is to look after marketing the output of all the local associations which have united in the co-operative plan. Now I have traced the origin and development of a co-operative organization for the marketing of fruits or vegetables. And what is the history of one is essentially the history of all. They are a necessity and a growth. They arise from conditions. As conditions arise, men usually provide the means of meeting those conditions. In this connection I believe it will be well to state some obstacles in the way of organizing co-operative associations. These obstacles arise from ignorance, perverseness or self-interest. Ignorance and perverseness may be corrected, but where self-interest is the origin of opposition, the problem assumes a more difficult aspect. Some men oppose anything that is a departure from the old and trodden paths. This I call ignorance. The man who prefers to go in the old rut rather than to pull onto higher and firmer ground, is either too ignorant or too indolent to make the effort. Such a man's opposition to organization, while natural, is not at all formidable and may be overcome with proper effort. Then the man who opposes just for the sake of opposing, just to be opposite, can usually be reached by persuasion or proper diplomacy. But the man who opposes because his selfish interests, as he may believe, are encroached upon, is the man who places his own interests above the public good. Such a man cannot be reached by any appeal for the general welfare, and will yield only when he finds that opposition will not avail. He usually appears in the person of some local manager, who conceives that if his local association joins the central organization his opportunity for self aggrandizement will be lost. He has influence with his

local association, else he would not occupy the position he holds. In such cases it takes time and a convincing appeal to the growers themselves, and in some instances, then, failure to bring in the local association may result. Such a man may wish to be placed at the head of the organization, and if the growers refuse to meet his wishes, then his disrupting influence will be actively exerted. If a bad year comes when prices are disappointing, and such years will come, the disorganizer has his opportunity and he does not neglect it. At such times it requires the best effort of the strong supporters of the organization to hold it together. I will not here undertake to state at any length the advantages of co-operation. I went over that ground pretty thoroughly in an article read before the Missouri State Board of Horticulture, which was published as Bulletin No. 12, and which may be had by writing Professor W. L. Howard, Columbia, Mo. However, I will summarize by stating, as concisely as I can, some of the most obvious advantages of co-operative effort in marketing fruits and vegetables. First. It secures a wider and better distribution of products and therefore a better price. Second. It enables the distributor to keep in close touch with the market and have a better knowledge of conditions in all territories into which his commodities may go. It avoids often the glutting of good markets, and the neglecting of others. Fourth. It enables the producers to keep good agents in the best markets to solicit business, and generally look after his interests. Fifth. It enables the producers to protect themselves more effectively against the loss caused by the improper handling of their products by the transportation companies. Sixth. It places the producers on a better footing with the trade, and therefore better terms can be secured. Seventh. It enables the grower to furnish a more regular supply to the markets as their needs may require, thus enlarging the consumption of his products.

In conclusion, co-operation in marketing has saved the citrus and deciduous fruit business in California from ruin, has built the truck business of southwest Texas to enormous proportions, has prevented the small fruit business in the Ozark country from languishing and being abandoned, and wherever intelligently applied has given success and satisfaction.

WEDNESDAY MORNING SESSION.

PRESIDENT'S ADDRESS.

As we come to the close of another year we look back and see many changes and many things done, and many things undone.

We miss from our number the genial face of our esteemed friend Dr. Loope. He was a man of many sterling qualities. I won't try to name them as you all know them, some of you better than I do. You know too, the many kind genial ways that endeared him to all.

Passing from these sad memories to what has been accomplished, we find that horticulture has made more advancement in the past year in this state than ever before.

Parts of the state that were heretofore unproductive of fruit are being developed and will, in time, be wholesale fruit sections,

Men who have never thought of owning a farm have bought land and are planting it all to fruit trees. It is the capitalists who are stepping into the work and not with their eyes shut. They have finally awakened to the fact that there is money in fruit raising and it is wholesome work and can be done in Wisconsin.

Our society is the source of information to all these beginners and a guide to many in their selection of location and varieties to plant. This society is very fortunate in having for its secretary a man who will "hew to the line, letting the chips fly where they will." No one can justly say that one section has been favored to the detriment of another, and this is right and as it should be, for after all we are all interested only in horticulture for the advancement of this work in Wisconsin.

Having confidence in our own state, we are interested in making her rank high in the list of states adapted to the production of the different kinds of fruit. Nor should we be more interested as a society in one line of horticulture than another,

but in each as they rank in importance. We should assist the development of each by a united effort.

The progress that has been made in the last few years is evidence of what can be accomplished by a good live society with a live secretary.

I attribute the rapid advancement, in horticulture in Wisconsin largely, if not entirely, due to the Wisconsin State Horticulture Society. Because it was at such meetings as this that we all became interested and then, as we went to our own several locations in the state, we interested others and so the good work has gone on.

There are many thinge yet to be done by this society. Many people are starting in horticulture who will need encouragement, who will need timely hints and suggestions. Our magazine is exceptionally well suited for this work. We are realizing its worth more and more. Here, again, we find that by the assistance of all who can, this magazine can be made to do a wonderful work in the advancement of horticulture in Wisconsin.

Timely hints and suggestions can be thrown out to the different lines of horticulture, market gardeners, home gardeners, the school grounds, home grounds, small fruit growers, tree fruit growers, commercial orchardist and home orchards.

This is all being done to some extent and by co-operation can be continued. You must not expect the secretary and editor of the magazine to be an encylopedia of information and should assist him in the line you can.

There are still fields to enter for new work along all lines of horticulture. New varieties of apples to test out for the benefit of the commercial and home orchard. New methods of culture to be tried, new systems to follow to maintain fertility of the orchards for years. Many methods to try out to prove many theories pertaining to the perfect development of the apple, that Wisconsin may grow and put on her own markets apples equal in beauty, quality and size to the best and most perfectly grown Western apple.

Those who visited the State Fair and viewed the horticultural exhibit saw evidence of beauty, size and color equal to any apples ever grown, and this leads us all to believe that, by careful methods all along the line, Wisconsin can produce apples with the most favored sections.

A little work along the line of systematic thinning of fruit to determine its value to the commercial growers, pruning to a less or greater extent and its influence upon the crops would be of value in all lines of tree fruit culture.

The information obtained could be applied to home orchards as well as commercial orchards.

A careful study of markets and conditions to determine more fully varieties and their merits for commercial planting—a little start in the use of the bushel box for fancy fruit etc., all live topics to be investigated and worked out by our society.

ANNUAL REPORT OF SECRETARY.

The outlook for horticulture in all its branches in this state is decidedly encouraging at the present time. We were sixty years laying the foundations for commercial horticulture in this state and on such a foundation we should build an industry that will rank with stock raising, dairying and other branches of agricultural endeavor.

Wisconsin ranks first in the output of dairy products, why not in fruit? Of those who will smile indulgently at this and perhaps doubt the sanity of the questioner I will ask another question: Why is Wisconsin the leading dairy state? Wisconsin soils are no better if as good as those of Illinois, Indiana, Ohio, Iowa or a dozen other states. Our grasses and grains are not more nutritious nor our seasons as favorable as those of many other states, and only one-half of the state in area is developed agriculturally.

No Solomon is needed to answer this question. Every one who has observed knows that it is due to the "men behind the cows," due to the wide-awake, progressive, seeking-to-know, spirit of our dairymen. Hoard, Henry, Smith and other leaders pointed the way, urged without ceasing the improvement of dairy breeds, better housing and care of stock, and above all the establishment of co-operative creameries and cheese factories.

For thirty years these men labored along these lines and with what results we know. The College of Agriculture, the

Dairymen's Association and the farm press of the state sought first to make dairymen, success followed as night follows day.

In extent of territory adapted to fruit growing Wisconsin leads many if not all of the states in the upper Mississippi valley.

We have millions of acres of apple land, of cherry land and of small fruit land; we have the varieties adapted to our climate; we have the market at our doors, why should not Wisconsin rank high in the production of fruit? And yet, in spite of these advantages, it is not long since horticulture in Wisconsin was considered a huge joke.

Strange to relate, we have even now in Wisconsin otherwise sane men who really and truly believe that the only place where apples can be grown with profit is some remote point west of the Rockies, some fabled land of sunshine, just at the foot of the rainbow. For it is a fact, which we cannot dispute, a fact which I am compelled to state, although reluctantly, that we actually have thousands of people in this state who have sent, and are still sending, good hard money to the far west for investment in "Unit Shares" in Colorado, in Washington, in Oregon and even in the Bitter Root valley.

Money for investment in so-called irrigated lands, where the water-rights belong to some one else than the land owner, and in salaries to so-called managers!

Fortunately not all of our people are rainbow chasers for we have and have had for some time a few earnest, progressive men who have demonstrated conclusively that: fruit raising is quite as profitable in Wisconsin as in any other state east or west; that more money can be made from fall apples in Wisconsin than from oranges or lemons in California or Oregon, or peaches in Connecticut or Georgia; that there is more profit in raising Duchess and McMahan apples in Wisconsin at $1.00 a bushel than in Winesaps in Oregon at $1.50 a bushel; that the McIntosh apple can be grown to a higher state of perfection in Wisconsin than in the west; that the Wisconsin grower can buy an acre of land and plant it to fruit trees and bring it to profitable bearing for less than it costs to ship a carload of western apples to Chicago; that the cost of producing a bushel of apples in Wisconsin is less than the freight charges on a bushel of apples from Washington or Oregon to Chicago; that there are cheap lands in Wisconsin; that

the state is 350 miles from north to south and covers nearly five degrees of latitude; that the Wealthy apple ripens in southern Illinois in July, in southern Wisconsin in August, in central Wisconsin in September, and in northern Wisconsin in October; that fruit growing is not a question of latitude but of isotherms, of local conditions.

All of this and "much more than twice all of this" have we learned within a few years and we are taking the lesson to heart.

These men have placed Wisconsin on the map, may their tribe increase!

Turning now from generalities to specific facts, we note that the 1911 fruit crop in the state, especially the apple crop, was an abundant one, and judging from all facts obtainable exceeded that of any year since 1896.

The total production of apples in Wisconsin is a very difficult matter to determine, but an estimate of 400,000 barrels for 1911 seems to be quite conservative.

Probably one-half of the crop was from farm orchards which averaged less than 50 cents a bushel on the market. That the farm orchard, as now conducted, is the greatest drawback to the successful marketing of tree fruits in this state there can be no doubt and it is the duty of everyone interested in this business to discourage the planting of fruit trees in farm orchards beyond the actual needs of the home. The fact that farm orchard fruit does not rank with that from the commercial orchard is not necessarily a reproach to the farmer. If he attends to his business as a farmer he cannot give the attention to fruit that it requires to produce first class quality. Nor need our attentions all be directed to the elimination of the farm orchard. We have as yet too few growers who give to the growing, picking and packing of apples the care needed.

Progress in orchard planting has been marked in three sections during the past year, viz., Door, Bayfield and Crawford counties.

Door county now has about 2,000 acres of cherries, to be exact 1998½ acres, and fully as much more will be planted during the next two years. Twenty-two cars of cherries, averaging 512 cases, and 48 carloads of strawberries of 512 cases each were handled by the Sturgeon Bay Fruit Exchange this year. This, as can be readily seen, is but a beginning. It has been

estimated that the shipments of cherries from Door county in 1920 will amount to two hundred carloads a day for twenty days, requiring an army of twenty-five thousand pickers. It is evident that grave problems face the peninsula growers.

One of the encouraging features of the situation in Door county is the steady development of the district north of Sturgeon Bay. Orchards of considerable size are now being planted at Egg Harbor, Fish Creek, Sister Bay and Ellison Bay, all on the Green Bay shore, and in addition a company of our leading fruit men has acquired a tract of four hundred acres near Ellison Bay, two hundred of which will be planted to apples next year. This, with the purchase of a three hundred acre tract by Professors Jones and Moore of the Agricultural College, insures permanent development of this section.

The Washburn-Bayfield-Cornucopia-Port Wing section is developing no less rapidly or surely than the Door county region. Extensive orchards of apples and cherries, as well as strawberry and small fruit plantations, are being set out each year, in fact, about as rapidly as land can be cleared it is set to fruit.

A newspaper report of late date states that sufficient fruit trees have been received at Washburn to set three hundred acres, and careful estimates show that at least five hundred acres of fruit of all kinds will be planted in the Washburn district this season.

Twenty-five carloads, 12,499 cases, of strawberries were handled by the Bayfield Fruit Shippers Association, which brought the growers an average net price of $1,50½ per case. Cherries sold readily in the local market at $2.00 per case. The Fruit Growers Exchange of Bayfield reports sixteen carloads of berries at an average of $1.50 per case.

The third section, which will be called hereafter the Kickapoo, is yet in the initial stages of development, and while no returns can be recorded the prospects are most encouraging. While Door and Bayfield are the cherry and berry counties, the clay ridges of the Kickapoo country will produce more apples than all the rest of the state if the present rate of development continues.

While these three sections have been treated somewhat in detail, it must not be understood that they are the only sections. Sauk county produces thousands of barrels of apples

each year, but here the business of fruit growing is not new. One buyer shipped 6,600 barrels, but reports the quality poor in the vicinity of Ableman, Reedsburg and North Freedom owing to lack of proper care in the orchards. Baraboo growers won a good name for care in pruning and spraying. The difference is readily explained, the former are almost without exception farm orchards while the Baraboo orchards are owned by fruit men.

Nor must we conclude that our opportunities are limited to sections where orchards are now growing, for there are many undeveloped regions in the state where conditions are as good or better than in the counties named.

The clay hills or ridges famous in Richland and Sauk counties extend north and west through Monroe, Eau Claire, Chippewa and Dunn counties. All that is needed in these places is the same sort of work that we have done in the Kickapoo to make them fruit counties, ranking with Orleans and Wayne counties of New York.

Waukesha and Milwaukee counties may also be classed as undeveloped, even though fruit has been grown there for seventy-five years. Milwaukee buyers send to New York and Michigan for apples that can be grown equally as well at home. Milwaukee grocers are today paying $4.00 per barrel for apples. Truly, Milwaukee county may be classed as undeveloped.

The small fruit business and vegetable growing have held their own in spite of drought and scarcity of help.

On the whole, the business of fruit-raising in Wisconsin is decidedly encouraging. Commercial horticulture is now an established industry and a rapidly growing one.

Our society has been closely identified with the movement at every step. We have aided and encouraged, and in some cases initiated work that has resulted in increased values exceeding in extent hundreds of times the amount of our state aid from the beginning.

SOCIETY BUSINESS AND AFFAIRS.

The reports of the secretary under this head from year to year show a marked resemblance, for the reason that the work of the society during past years has been alike. You must not understand from this, however, that we stand where we did one year ago, for we have grown immensely in a year.

The membership now numbers 1779 consisting of 1572 annual and 207 life members, an increase of 333 annual and 27 life members since the date of my last report.

While the increase has not been all that was hoped for, it has been steady and lapsed memberships are few. We have lost during the year only..... members.

While there has been a steady increasing effort through the office of the secretary to increase the membership among those whom it would benefit, no mad efforts have been made to add names merely for the sake of size. We hope some day to have at least five thousand members, but we want at least four thousand nine hundred and ninety of them to be horticulturalists at heart.

A marked improvement is evident from year to year in attendance and interest at our meetings. In the early days of our society the conventions comprised about all of the work, but they are now merely an incidental feature. They furnish, however, an accurate index of the success of our work and still constitute a valuable part of our efforts in horticultural uplift.

The exhibit staged by our society at the State Fair was the first real apple show ever held in Wisconsin and was a splendid success from every point of view. A detailed description of this exhibit is neither necessary nor expedient at this time. Over one hundred and fifty bushels of apples were shown that excelled in size, coloring and quality any ever before shown in Wisconsin. Twelve thousand people, by actual count, passed through our tent on Thursday, and for the week at least 60,000 visitors enjoyed the privilege for once of seeing good apples.

While the exhibit was expensive, it is generally agreed by all of our members who saw it that it was worth many times its cost.

Our infant, WISCONSIN HORTICULTURE, is now nearly a year and a half old, has passed safely through all ills incident to childhood, and is pronounced by its many admirers a healthy and likeable child with a promising future.

We still answer questions, thousands of them, during the year. While the magazine provides a medium for answering questions of general interest, many are received daily that require an immediate reply.

The Information Bureau still remains an important feature of our work.

Our main features, trial orchards and school grounds, have progressed with satisfaction and success during the year. As a more or less complete discussion of the school problem appears in the January number of WISCONSIN HORTICULTURE, it will be unnecessary to go into details at this time.

The status of our trial orchards will also be reported by the chairman of the trial orchard committee.

In conclusion, I desire to extend my sincere thanks to the officers, the members of the executive committee, and the members of the society for their hearty good will and continued support during the year. Our society is doing a splendid work, and whatever results we have attained have been due wholly to the loyalty and cohesion of the membership body. United we stand; two thousand earnest active members—and we must and will make things move in good old Wisconsin. We still have much to do, many problems to face, but we are not afraid. Nature has bestowed on us the soils and the climate, all we need is the "man behind the tree." We have a few of them now and they are putting Wisconsin on the map as a fruit state, when we get a few hundred more, each with his fruit farm of ten to one hundred acres, and we have them right here at home if we can only find them, when these men get under way, the prophecy of your secretary that Wisconsin will one day rank first of all the states in the production of fruit will not seem such an idle dream.

REPORT OF LOCAL SOCIETIES FOR 1911.

Name of society.	No. members.	Increase over 1910.	Membership fee.	No of meetings.	Average attendance.	No. of exhibitions.
Washburn	57	1st year	1.00	8	22	None.
Bayfield	125	10	.50	2	50	Store window exhibits.
Madison	35	12	1.00	6	12	None.
Manitowoc Co.	44	8	.50	2	50	One.
Lake Geneva	40	.....	2.00	18	15	Three.
Oshkosh	29	16	1.00	12	20	None.
Poysippi	14	1	.25	3	17	None.

On motion, the reports were accepted as read.

REPORT OF CHAIRMAN OF TRIAL ORCHARD COMMITTEE.

Last summer, when the Wausau orchard was about ready to harvest, the trial orchard committee made a trip to that city and looked over the condition of the fruit and the markets. The committee estimated the crop in the orchard and accepted bids for same, considering the highest bid a fair price for the apples, the per cent of number ones running small, owing to the damage done by the summer hailstorm.

The productiveness of the various orchards can be readily determined by the superintendent's report.

The committee found the cultivation in the orchard very satisfactory, the trees in good condition, and that the spraying had been quite thoroughly done, the fact being proven by the small percentage of wormy apples found. The portion of the orchard devoted to plums, being practically worthless, should be cleaned up, as this would add much to the appearance of this valuable apple orchard. After the summer meeting of the society the committe visited the Sturgeon Bay orchard, finding conditions similar to those of other years. Here the cultivation was good, the spraying found quite satisfactory, excepting some evidences of sun scald on the apples, indicating that lime and sulphur in conjunction with heat may produce injury.

The Switzers in this orchard were found to have blighted themselves nearly to death. The committee decided they should all be cut out and burned for the good of the balance of the orchard.

Some time after this, after the long wet spell, which made the orchards very muddy, the committee, with the exception of Mr. Palmer, started out October 9, and visited five more orchards. We visited first the apple orchard at Manitowoc, finding it very promising and thrifty. Here we found a very heavy cover crop, properly following a summer of clean cultivation. At this orchard the committee advised some experimental pruning to try and rectify the badly crotched condition of the trees. These, I might add, were in this condition when planted, having been poorly pruned in the nursery and grown too long there before being planted. The cherry orchard was reported in a very much more promising condition than the year before, although about seventy-five or one hundred trees are needed to replace the dead and crippled ones, many of which should have been pulled out and replaced the year before. The cover crop, together with the manure advised to be applied, will add humus enough to the sand, so that in another year a marked difference should be noted.

Then on to Sparta, where a visit was made to the grape vineyard. Very little need be said about this, as the vines are still young. After some argument over the pruning and future care, the committee decided it would perhaps be advisable to mulch quite heavily along either side of the rows to prevent the great wash which is occasioned by the location of the vineyard on this steep hillside, composed of a soil the major part of which is clay.

We met the superintendent of the Whitehall orchard on the train, and as we had learned of its condition before hand, felt that his O. K. was all right. This orchard also has had the cover crop in the fall after the cultivation of the earlier part of the season, and made a very satisfactory growth.

Upon entering the Barron orchard one has staring him in the face certain well drawn lines, very marked, and very beneficial from the standpoint of experimental work. This orchard, while an utter failure from the standpoint of successful orcharding, is nevertheless a howling success in determining where not to plant commercially. In this locality they

had better stay out of the apple business, especially on lands of a similar nature, for we find the trees about worthless after the second year. In this orchard the trees become black at the heart after the removal of limbs, even the scars caused by the removal of the smallest limbs never heal over, and a serious condition exists from this time on. Upon some of the most favorable soils and upon some of the best drained lands possibly the home orchard might be made a success, but do not plant commercially. This orchard had a soil capable of producing very good farm crops, as shown by the cover crop growing there.

The Popular orchard was later visited and found in good shape, that is the plums and apples were, and as the cherries were abandoned some time ago, these are all there are to be considered now. The trees are doing well and look to be in good condition, since the plot was tile drained. There were a few apples this year, and as to quality they were fine for we sampled some. This was the only orchard from which we received an apple during the entire trip.

The President: There are one or two other orchards that are not reported on. I should like to ask Mr. Hays to speak of the Gays Mills orchard.

Mr. Hays: I lived in the orchard practically all summer. The orchard, which was planted in 1908, has made a remarkable growth, and I think we are entitled to the credit of having the best growth of any orchard in the state of its age. We have some Northwestern Greenings that certainly show remarkable growth. We took some measurements and we found one tree four years of age that measured 12 inches in circumference and was about 13 feet in height, and Mr. Cranefield and others will bear me out that the trees are very much alike, there is not very much difference, this one is not an exception. Our Wealthies bore some apples this year; this was the only variety that bore any quantity. We had some trees that were loaded. One tree in particular had 176 apples, all of them of good size, all perfect. We practice clean cultivation, as recommended by the Society, and cover crops. We have sown oats and had a good cover crop every season. Our cherries planted in 1910 have shown fully as remarkable a growth as apples, but we have nothing to report of those except the one year's growth. We have used

the same culture methods as in the apples. Grapes planted in 1909; one acre yielded this year 1600 pounds of grapes. Those grapes netted us $58.

The Secretary: I will ask permission of the president to swear to all that has been said in regard to Gays Mills orchard and I would go even further. I want you to bear this in mind in regard to Mr. Hay's report, keep always in mind this fact,—that orchard was planted in 1908, not in 1898. In the fall of 1911 one tree bore 176 apples. It was a lot of fun down in Milwaukee to show the Western fruit men around. I never enjoyed anything more in the fruit line in my life. They would admit, step by step, that "these are good apples." "Aren't they as good as you can raise in the West, as large, as finely flavored?" "Yes, they are, they equal ours in quality, in size and in color." I had to drag that out of them. "But there is one thing in which we excel, and that is early bearing." Then we would get around to Mr. Hay's exhibit where he had the 176 apples from one tree planted three years, and then there was no further argument. It demonstrates beyond any possibility of a doubt that we have in Wisconsin all of the elements necessary for the successful raising of fruit and that is demonstrated fully in the Gays Mills orchard. Do not get the impression from what I say that I believe that that is the only place in Wisconsin where that can be done. It can be duplicated in a dozen different places in the state, right at home, right on your own farm, no doubt.

Mr. Hays: This Wealthy tree was not a freak tree; we had another tree that had 130 apples on, another 110, and so on. I could have enumerated quite a number, but that was the best.

A Member: May I ask the gentleman the age of the trees when planted?

The Secretary: They were the ordinary three-year-old nursery tree. The stock in that orchard came from three different places. The Wealthies were from Iowa; some of the trees were grown in Missouri.

The Secretary: It was not the duty of the Superintendent of Orchards to report at this time, it is the duty of the Trial Orchard Committee. The Lake Geneva orchard is in the most excellent shape, it is the closest rival of the Gay's Mills orchard that we have among the demonstration orchards, and

I want to point out this, so that we may keep it in mind in the future. The Gays Mills orchard has never been cropped, never has been anything taken from the ground. We cultivated and cover-cropped it, rather an expensive proposition. The Lake Geneva orchard, planted one year later, same kind of trees and under like conditions as possible, excepting distance apart, has been cropped lightly, that is, has been cropped to beans, etc. Five or six years hence we will be able to measure results. But up to date the Lake Geneva orchard is in excellent condition.

ORCHARD CONDITIONS IN WISCONSIN.

BY MR. G. H. TOWNSEND,

Madison, Wis.

(Paper read by Mrs. Townsend)

The Wisconsin State Horticultural Society has done a great service to the fruit growers of the state by it's trial orchards and the collection and dissemination of the accumulated knowledge of it's members. The Society is, in fact, a sort of beacon light to ward off Pomona's ship from the rocks and shoals, so that she can sail on in her majestic glory, past Bingham's shores and Cranefield Bay to Apple Harbor.

Our officers are indeed, practical men determined that the people shall not only know how to raise fruit, but that the fruit shall be raised.

Of course, the society cannot compel people to devote time and money to fruit growing, but as the highest authority in the state it can put all action in cold storage by continually saying "don't" and it can greatly stimulate activity by saying "Come on, here is the place and now is the time!" Achievement is what is wanted, but as there can be no achievement without means, there is the ever troublesome question, how-shall the thing be done?

Some think that the work of the society should be mainly to aid farm orchard development; others opine that only indi-

viduals will make success, and still others believe that companies or co-operative orcharding is most likely to succeed.

In view of the fact that there is undoubtedly a lack of information and considerable mis-information, it is an opportune time to consider conditions in Wisconsin in their relationships and find out what is necessary to make orcharding a success. It is, of course, true that some varieties of apple trees will grow almost any place except in the swamps, but it is one thing to raise trees and another to raise good fruit.

The matter of growing apples for home use may well be undertaken anywhere, because the expense is not large and crops at rare intervals justify the undertaking, but growing apples as a commercial enterprise necessitate yearly crops.

THREE YEARS TO GROW APPLES.

There are but few people who ever stop to think that it takes three years to grow apples after the trees are old enough to bear fruit. The branch grows the first year, the fruit spurs the second and the apple the third. The problem is how to develop all of these each year, and it is the failure of orchardists to recognize this need that results in one crop in every three or five years and in some cases complete failure to grow any crop at all.

SOILS.

A recent article in one of the fruit magazines stated that any soil with a porous sub-soil four to six feet deep was good apple soil. That statement may be true in some localities, but as a matter of fact, a soil that will produce large crops of apples every year, requires ability to grow branch, spurs and apples at the same time and to do this must possess at least three distinct characteristics.

The first of these is humus, and the man who planteth apple trees in soils without humus will later tarry in the shadow of his own disappointment. There must be an abiding place for soil bacteria and even though the soil have enough substance to last hundreds of years, without humus it profiteth nothing. True, the humus can be put into the soil by turning under green crops or with coarse manure, and if this must be done, in the language of David Harum I would say, "Do it

fust." If we are not satisfied with our faces we can add any tint we desire when we desire, but putting color on apples is quite a different thing and the scientist answers the wail of the grower with colorless fruit, "apply potash to the soil," and so if we are to have red cheeked apples as the complement of our lovely rose cheeked maidens, the soil must have the necessary mineral elements, potash, phosphorous and iron.

Aside from the elements of plant food, an apple soil must not be too heavy nor too sandy—one holds too much and the other too little water. Such a soil is designated as a "Clayey loam." The soil should be deep and contain some gravel and limestone usually found in limestone ridges.

It is claimed by some that the founders of the "trusts" followed the Indian legend of creation which is that the world was first made of water, and a certain political faction insist that the water used by the trusts can't be gotten out by any system of gravity. Here the fruit grower has the advantage, for he can plant his orchard where the land has enough pitch or incline to allow gravity to rapidly draw away all surplus water. If an orchard must be planted on level land, drain tile put in at a depth of four or five feet between each row of apple trees will meet the requirements. The orchardist should not only be seriously concerned about how to get rid of all excess of water, but also how to keep enough water. If we plow a plot of ground twelve inches deep and then work it down until the plowed ground is approximately thirteen inches deep, and then saturate it with water until it ceases to flow away, it will hold three or three and a half inches of water and a like amount of air. Twenty-five per cent water would be an insignificant percentage for a trust and twenty-five per cent air, wouldn't be a starter for a Western land boomer, but these are highly conducive to plant growth in warm weather. If we increase the percentage of water it will push the particles of earth farther apart near the surface, and beneath it will push the air out as no two substances can fill the same space at the same time. If the subsoil holds too much water the bacteria that transform the simple chemical elements of the soil into the complex elements of the plant—the tree—becomes inactive, whether from pneumonia, la grippe or merely colds I leave for further investigation.

The roots of apple trees will not penetrate deeply into soils that contain an excess of water, not only because of their aversion to "cold feet" but because such soils contain too little air. Excess of water may be the cause of arrested development any time during the growing season. Old orchards may be found in an adjoining state that have never produced a good crop of apples because always sick from too much or too little water.

On the side of too little water may be found withered hopes and razed castles. When the water content falls to one and a half inches to each foot in depth, growth ceases. Here the advantage of deep soils is manifest as each foot may add a quarter or half more water supply. If the moisture be insufficient, three things may happen: Should the tree be bearing much fruit there will be but little growth of branch and few or no fruit spurs; the apples may drop before maturity or mature under size, the tree may kill from the lack of moisture or winter kill by freezing dry.

When the best soil has been chosen the conservation of moisture belongs to the art of the orchardist. If you look well to the water supply and keep it ample without excess, you may expect a crop of apples every year, provided of course, the bloom is not frost-killed. In this particular Wisconsin is in far better position than the orchardists of the South and Southwest, and even the Southeast. It was reported in the fruit journals that one locality in Colorado used a hundred and twenty thousand orchard fires and then lost their fruit, or the most of it, last year. This condition is likely to be a frequent experience because the cold air from the mountains is continually sinking into the valleys. The late blooming period in Wisconsin makes it practically free from frost killing in favored localities. It is the every year crop that counts because expenses go on, crop or no crop, and frost killing not only takes the crop killed but may break the routine of the tree and grow nothing but wood—no fruit spurs—if the season be wet.

We make no extravagant claims for Wisconsin which is unlike those of our brothers toward the setting sun. There is so much al-ka-lye in the West that one might easily be saturated with the part used to make soap and owing to the amount of air in circulation, some people are puzzled to know whether

the western tornadoes are cause or effect and ascribe much of the western interest to one word of five letters: b-l-u-f-f. Wisconsin's future apple greatness will be spelled the same way only in the plural: b-l-u-f-f-s, but the difference is that Wisconsin bluffs are God-made and need no artificial man-made substitute. All our lives we have heard that elevation protects from frost, but it is not the whole truth. Frost may kill at a high elevation and not kill at a much lower one. The principle is this: Cold air falls and warm air rises. High elevation does not protect from frost on large areas or if there should be still higher land adjacent to throw down the cold air without a lower basin or valley near by to receive it.

You have heard of people going so fast that they "only hit the high places," and the reason that Jack Frost don't hit the "high places" is because his increased density—the effect of cold—makes him fall into the holes, so to speak.

The high ridges adjacent to the Mississippi and Wisconsin rivers in southwestern Wisconsin are exceedingly fortunate in this particular, and this region contains a large acreage of unsurpassed apple soil, filling all the conditions heretofore enumerated. Large bodies of water are also a protection against frost and operate in this way: The sun shines on an unmoved surface of land all day and it warms during the day faster than the water, because the water moves and comes up from the depth. As long as the ice remains unmelted the cold air holds back vegetation for some distance from the water shore. After the water begins to warm the land cools faster at night than the water and this creates warm currents to overcome frost and considered from the practical view point, commercial orchards should only be planted near the lake shore or on high ridges. In the matter of continuous or frequent rains during the blooming period which seems to prevent pollenation, Wisconsin is more fortunate than any of the apple regions South or Southeast.

The "Bogey" man of the Wisconsin grower is winterkilling, but it should be borne in mind that he is not the only one, for the orchards over a large part of the "corn belt" have at some time been winter killed, and as the danger of winterkilling decreases southward that of drought killing increases. Experiments in the Northwest show that some varieties will winterkill even when top grafted on hardy stock, or root pro-

tected, while others will not. In our present state of knowledge we are not able to tell from physical structure how much cold a variety will stand, but that the main reason for top hardiness is maturity of each seasons growth, and a fair index of this is early ripening of fruit. An apple grower should raise the very best varieties and cover the longest season possible his region will permit, but must recognize that the shorter the season the more limited the number of varieties he can grow, and these must be early maturing kinds. The hardiest varieties, called "ironclad" are the Duchess, Patton's Greening and the Hibernal—the latter raised mainly for top grafting. These varieties will stand the winters 42 degrees beyond the North Pole. The Wealthy is the hardiest apple of quality and will stand any part of Wisconsin if grown on a good apple soil and winter protected by snow. Where it winter kills it should be worked on the Hibernal. The Dudley, Snow and McIntosh come next in hardiness and the McMahan and the North Western Greening seem to be next. The superior quality of the Snow and McIntosh will enable Wisconsin to capture the world's markets if the growers so desire. From the information at hand it appears that a good many people are inquiring for good hardy winter varieties without being conscious that more than hardiness is involved. Each variety has its cycle of development and this cannot be speeded up like an automobile.

The early winter varieties, such as the Jonathan, Grimes Golden and the Delicious, will require about three weeks longer season clear of frost than the Wealthy. The Ben Davis will require still more time and it is only medium late. Some varieties will adapt themselves to short seasons, but it is like shortening a coat with a pair of shears—so much cut off in size. In proof of this, the Ben Davis and the Jonathan have been grown top worked on Hibernal so far north in Minnesota that they only attained the size of crabs. The longest season in Wisconsin is to be found on the high ridges in the Southwestern part of the state and here the Ben Davis will not grow full size except in the longest, warmest seasons. The Jonathan, Wagner, Grimes Golden and the Delicious have somewhat shorter seasons and will grow approximately full size in southern Wisconsin. The short life of the Wagner can be overlooked because it is an early and prolific bearer. The

Jonathan has stood well on its own roots in Richland county. The Delicious has grown well, so far, both on its own roots and top worked, and the Grimes Golden top worked, so that it is safe to say that with root protection in the winter or top working on root hardy stock our South Western ridges are destined to become famous as the northern limit of these fancy varieties, and while our percentages of large sizes may not equal those grown in the southern apple districts, we have advantages in regularity of bearing, later keeping qualities, a home market, and enjoy a late exclusive market for these, as the Bayfield district does in strawberries. It is time for Wisconsin to take notice of the success and failures of top grafting. Extensive trials in the northwest seem to justify the following conclusions:

(1) It is not practical to greatly shorten long season apples by grafting winter varieties on summer trees, such as the Duchess.

(2) Varieties that are top hardy but not root hardy may be made entirely hardy by top working on root hardy trees of similar or slightly earlier maturing season.

(3) Varieties that grow rapidly should only be grafted on rapid and not on the slow growing kinds.

(4) The scions should be inserted in grooves sawed in the limbs and not by the split cleft method and the grafted limbs should not be much more than an inch in diameter and preferably smaller.

The prospective orchardist must keep his market in mind and so long as the large cities afford a market for short keeping apples the growers will be happy, but when it comes to distributing short season apples to towns and villages in less than carload lots the grower will be confronted with quite a problem and cold storage near the orchard will be a necessity. If we expect to grow apples in Wisconsin, it would be a great mistake not to choose a location where nature has done the most, and when this has been done the art of man begins. He must meet the requirements of those trees that grow too much or too little wood; must fight insect pests in the right way at the right time with adequate equipment. In dry seasons moisture must be conserved by cultural methods and in wet times excessive water must be drained away. To meet difficulties, to guard against them, to gather and market a crop and do

everything in season requires considerable business and executive ability, so that a capable man cannot afford to sacrifice his time for the income obtainable from a small acreage.

FARMERS NOT APPLE GROWERS.

The conditions outlined practically eliminate the farmer because only parts of a few counties are really good orchard lands. Orchard work and farm work nearly always conflict and when they do the farm gets the labor and the orchard gets the bugs. Individual orcharding would be ideal if conducted on sufficiently large scale, but men who have large enough means usually have too much on hand without the care of an orchard, and young men who are disposed to such employment have insufficient means alone; and this brings us to

FORMS OF COLLECTIVE ORCHARDING.

The term "collective orcharding" as used is intended to cover all associated or co-operative orcharding which must take one of three forms: The incorporated company, the undivided acre unit systems, or the divided tract method of five acres.

There was a time when men associated themselves together in business enterprises as partners, but this form has for good reason been almost entirely superseded by what is known as "incorporated companies," which are authorized by every state, but varying as to conditions and requirements. The collective means of several used as one is in our opinion a practical method to operate orchards in Wisconsin, because it is possible to do so on such scale as to meet the essentials of successful orcharding such as the use of power, sprayers, tools, shed and cold storage which lengthens the season of handling the crop, the advantage of being able to ship in carload lots at all seasons, and keeping help employed all the year. The small grower must buy barrels made up while the large grower can buy his stock and make his barrels, boxes, crates and baskets in the winter season. The large grower also finds it easier to get pickers because more widely known and longer season of work. The large grower may also use culled apples in various ways not practical for small ones. Growing apples to make money not only requires

knowledge of fruit culture, but a good deal of business and executive ability and such a man would earn a thousand dollars a year and upwards in other employment. Now, if a man's time is worth a thousand dollars a year, that would be a tax of one hundred dollars an acre on ten acres and the larger the acreage the less the acreage burden for management. This shows something of the relative advantage of large as against small operations. Apple growing under present conditions is a commercial business requiring knowledge and capacity. The Agricultural Colleges are educating young men for this work and a considerable number of these with experience will be fitted for this work and capable managers will be easy to get, provided the undertaking is large enough to justify compensation equal to compensation of teaching or the salaries such men could earn in other kinds of business. The objections of some against an incorporated company, that men have bought mining or other stocks and lost their money, is no valid objection to an orchard company. Some concerns never intended to do any actual business but were organized solely to swindle credulous people out of their money. The objection that legitimate corporations in other kinds of business have been wrecked by schemers has some force. This has usually been done by expansion and debt. Expansion carries large expense and means usually no dividends, and fear and dissension among the stockholders which is an opportune time for some creditor to bring suit, have a receiver and ultimately sold under execution to pay debts. The wrecker buys in the property and goes on to fortune at the expense of the original stockholders. It is a pity that our laws are unable to reach more of the stock swindlers and the only safeguard in corporations is the character of the men composing it.

To meet the objections to corporations the "Unit System" was invented which is a system of individual ownership associated together and operated as a whole. An individual or a number together forming an operating company can buy or may own a tract of any amount and sell it in acre units. The land is conveyed to a trustee for convenience of transfer and safety. The trust deed sets out the conditions of the trust, such as no debts can be contracted by either the trustee or any other person except the purchaser of the unit. After sale of

units the operating companies continue care and development as agent or lessee. If the tract contained one hundred acres there would be one hundred units numbered from one to one hundred, undivided. The purchaser of one or several units gets a certificate from the trustee which is usually a bank or trust company, and also signed by the operating company that develops the tract. When the purchaser pays for his unit or units he leases his interest for perpetuity or for a term of years, so that all the units are operated by one manager and the compensation is usually twenty per cent of the net profits. The unit holder pays no salary and only the labor and material are charged as expense.

The objection offered against this system is that the operating company as lessee might quit and in such case it would be an orchard property without a manager, which might happen to an individual or a corporation.

The third system is the five acre plot or some multiple of it. Under this plan the company selling the plots contract to plant and care for the orchard for a number of years. Many persons under the belief that a small plot of ground in orchard meant independence will some day wake up to find disappointment instead of fortune. To those who merely want a country home in summer or all the year any acreage will answer. Those who have been accustomed to earning good salaries and expect to get the equivalent out of fruit should have twenty acres at least. Owners of small tracts will find it most profitable to combine in the matter of tools and equipment and in selling their product. To persons having some income small tracts of five or ten acres will make a homestead, but others having good health and good positions had better invest under plans previously described and continue in their regular work.

Perhaps the ideal way would be for each unit owner to pay a small sum in addition to the price of the land into an equipment fund and in this way form the operating company from the unit owners. There would be no temptation to wreck the operating company because it would not reach the land—not affect the orchard. We have endeavored to set out the possibilities and conditions as clearly as possible so that the prospective orchardists may see for themselves what is practical.

The Secretary: There is one subject that perhaps might be brought up at this time, in view of the fact that Mr. Hanchett

was not here yesterday when his paper was read. There are two points brought out in that paper that seem to me are of the utmost importance to the fruit grower of the state. One, calling attention to the fact that there may be overproduction of fruit in the state owing to the extensive planting, and the other a warning against the exploitation of the fruit business in this state on the part of large companies and corporations, that is, putting out large areas of fruit in contradistinction to the making of homes of fruit men. Mr. Hanchett is now here and can speak for himself.

Mr. Hanchett: I think Mr. Cranefield has stated pretty closely the things I wish to point out. I was sorry I could not be with you during your discussion of the paper yesterday; I assure you it was not because I was afraid to stand by my guns. I wish to state now, however, that a fear of overproduction in my mind is not so much of a threatening cloud on the horizon as a fear of over-exploitation. I think that will be a point that we will never reach, that is, overproduction in fruit in this state, if it is done in the way of natural development of building up homes by actual residents, owners. One of the things that I did think that this Society should point out was the swindles which would doubtless be carried on in the name of orchard development in this state as they have been carried on at other points, this fleecing of the innocent sucker through the inducement that all he has got to do is to sign a contract in a certain orchard company, pay over a few dollars of his hard earned salary every month, that is something that we ought to discountenance and to put a stop to. In regard to the paper which was read, I am glad there is some one that is trying to think out a plan by which collective development may be carried on in a way that will profit the investor. I have not found out what any of the men towards whom I directed inquiry and discussion yesterday gave as their opinion in regard to development in their section, but I am of the opinion that every one of them can truthfully say that there is a chance for a considerable amount of development in horticultural lines in their respective sections. For my part, I believe there is a chance for great development and it is one of the things that we want to see. But one of the things that we should guard against is the swindling of innocent people through wildcat companies who will surely take up the work.

The Secretary: I do not oppose companies that are doing a legitimate business. We have some of them in this state, both stock companies and orchard development companies, but we are also getting the other kind. There will be printed matter circulated throughout the state during the coming year advertising extensive orchard companies and investment companies. First of all, I want to give you that warning and I hope that it may go out through the press that it is the feeling of the members of this Society that we do not encourage that sort of thing, that we are not so crazy over the development of fruit that we will endorse anything and everything that comes to hand. There is another thought, and I do not hesitate to say it, that the companies that are now developing these large propositions in my mind are making a mistake if they say to the investor that the investment of $1,500 or $2,500 will bring them an independent income. I care not if the annual income from an acre of cherries in Door county is $500. Of course the question of development along the other line of individual ownership is entirely aside from that, but I do not want the public to feel that we approve and endorse the large co-operative ventures as the best method of development of the fruit industry in the state. I insist that the substantial development in this state will come from the homes. We may have a thousand acres in one block and we will have but one home. If we had that divided up into ten or twenty acre tracts, we will have hundreds of homes. That is what we want. We want the man behind the trees. It is the development of homes that we want in the state. We do not want to discourage any legitimate honest investment venture. Two years ago I said in my report if we can have a company in this state that will plant one hundred acres of fruit in one block, we will have something that will surprise the people of the country. We now have a hundred and forty acres up at Sturgeon Bay, but I believe we do not need to encourage that sort of development any further, that every one should work for the development of the fruit business along the line of individual ownership.

WEDNESDAY AFTERNOON SESSION.

THE FARM ORCHARD.

H. C. MELCHER, OCONOMOWOC.

In his letter assigning me a place on the program of this meeting Secretary Cranefield said I was expected to plant and care for an orchard of two dozen trees to supply the farmers' family with apples *with none to sell.* To keep well within the question, I think I will resign at the end of five years, for I cannot imagine the family this side of Salt Lake City that could profitably use the product of these same trees after they reach maturity.

In times past it was often necessary to spend some time in meetings of this kind to try to prove that Wisconsin could raise apples at all, but after the showing of the past year we think that question is forever eliminated and will never be shot at us again. The commercial orchardist is taking advantage of the knowledge gained and there are being more large orchards planted in Wisconsin than ever before; and why should not the farmer also take advantage of the situation and profit by it?

The subject is "The Farm Orchard"—an old subject—one that has been discussed so often that we feel our inability to present anything new, but we remember that the Gospel has been preached for nearly two thousand years and there are still sinners in the world. The evangelist that comes to your town does not come with a new story but it is the same old story told, perhaps, in a little different way that finally compels you to "come across." and so, if what I have to say will induce someone that has no orchard to start one, or cause another one to add to his, I shall feel that my effort has not been in vain.

In locating the orchard the farmer is at a disadvantage. It must of necessity adjoin the home grounds. He may have an ideal spot in a remote part of the farm, but his two dozen trees would be at the mercy of tresspassers and would not receive many of the little attentions that could be given it when close by. It is very often possible to have the orchard simply an ex-

tension of a well kept lawn. Wherever I have noticed this the effect has been very pleasing.

If there is one mistake more common than any other in the farmers' orchard it is that of too close planting and this in spite of all the advice given on the subject. Twenty-four feet each way seems like a long distance for the young trees but you can still cultivate and raise crops for the first five years and by that time they will not seem to be so close together and you can afford to let them have full possession.

I have in mind an orchard just across the street from my home, formerly owned by my father. He was a great lover of trees, also an agent for nursery stock and always did his own delivering. At the close of each season all surplus stock was planted in his limited grounds. It was so closely planted that cultivation was never possible. In this orchard were many of the early bearing varieties and for a few years bore good crops. This orchard is on a much traveled highway and was always pointed out as an object lesson in favor of close planting and was largely copied. It is now twenty years old, and although many of the trees have been cut out, it has been unprofitable since it was twelve years of age.

I have seen only this last year new orchards started with trees but sixteen feet apart, or worse still, have seen young trees planted between older trees that were already too close together. The farmer is very often an easy mark for the persistent fruit tree agent and will often give a small order to get rid of him and think no more of it until the trees are delivered when he will take his spade in one hand and his trees in the other, will hunt for a place where they will be the least in the way and never give them another thought. That farmer's two dozen trees will never supply his family with apples.

In selecting varieties the farmer has the utmost latitude. Commercial growers usually grow what the public demands, or try to create a demand for what they grow. The farmer can grow many choice varieties that are not usually considered profitable but they add variety and sometimes help to lengthen out the apple season.

Do not make the mistake of planting too many early varieties. Remember we are not raising apples to sell. If you are living up to your privilege you also have small fruits on your farm. You have passed through the strawberry and raspberry

season and there are still blackberries to be had when the first apples are ready. You are not so fruit hungry as you will be at almost any other time of the year, so for that reason we would not have more than four of the two dozen early varieties, and I would have as many different kinds. We all know the Duchess is the leading early apple, but no family wants four Duchess trees. Other good ones are Yellow Transparent, Tetofski and Red Astrachan.

The gap between summer and early winter can be profitably filled in with Wealthy, Longfield and McMahon. If you plant two of each kind they will furnish more apples than you can use, but you may want to make some cider and Longfield and Wealthy are excellent for that. You will also want a couple of crab trees and I would recommend Whitney No. 20 and Sweet Russett. They are good to eat, excellent for pickling but worthless for jelly. Never plant a Transcendent unless you can plant it by itself in an isolated place, for it will surely blight and carry the trouble to all of its neighbors.

This will leave twelve trees for the winter apples. They are not, as a rule, as productive as the earlier kinds and besides we expect them to take us over a longer period of time.

For early winter we have Fameuse, a general favorite, and no home orchard is complete without it. While it lasts we do not care about anything else.

Seek-no-further, Newell and Talman Sweet are also entitled to a place. The Northwestern Greening never was a favorite of mine but it is still "fashionable" and perhaps you had better have a tree or two of it. You can also plant Ben Davis with the assurance that it will live and bear you good crops, but remember once more that we are not raising apples for sale.

Grimes Golden is a winter apple of high quality that should have a place in every orchard. Grown in Wisconsin it is a much longer keeper than when grown further south, and will keep well into March. You can see samples of this variety at this meeting that in type, size, color and quality are the equal of those grown anywhere.

We will now assume that you have planted these two dozen trees and cared for them to the best of your ability, that you have cropped the land rationally and not at the expense of the trees. We will pass over the intervening years and take a look at it at the end of five years. If you have given the trees

a "square deal" you have had some apples and you have learned how much more satisfactory they are than the same kinds taken from the purchased barrel. But is that all you have learned? If you have been at all observing you have learned many things. In the beginning the trees all looked alike to you, but as they have developed you have noticed some one thing that is peculiar to each variety and you find that you can go into a strange orchard even before fruiting and name the varieties almost as unerringly as the experienced stockman can separate the different breeds. You have also noticed that one variety unaided will grow into a perfectly symmetrical tree while another with the same environment, like a wayward child, will need almost constant correcting to keep it within bounds.

If your orchard is on the highway the passerby has often stopped to compliment you or ask your advice and you see the necessity of posting up on these questions and in this way you are educating yourself. But beyond all this you have seen how it has added beauty to your farm and incidentally has added value. We believe by this time you are so much interested that you will not stop with the two dozen trees, but, like the collector of antique furniture or rare coins, you will want everything you see or hear about. I have heard a story told of our A. J. Philips, and I can easily believe it, that he once traveled fifty miles to secure a few scions of a promising seedling. An outsider would call him a crank, but to us he is an enthusiastic horticulturist. We think some of this spirit was born in him. We also believe much came to him through cultivation and he just can't help doing such things.

We believe the farm orchard, more than any other one thing, is responsible for the "back to the land" movement that is so strong at the present time, and we are sure you are not looking forward with so much pleasure to the time when you expected to sell out and move to the city, and this couplet from Goldsmith comes to you with its full meaning:

> "How blest is he who crowns in shades like these
> A youth of labor with an age of ease."

You have suddenly discovered that you are in love with your farm and would not part with it at any price.

But this "back to the land" movement is not new. It is as old as the hills. Let us quote once more from Goldsmith; after traveling over most of the civilized world and having partaken of most of its pleasures, the time came when he longed once more for the rural scenes of early life. Listen to what he says:

"In all my wanderings round this world of care
In all my griefs—and God has given my share—
I still had hopes my latest hours to crown
And in these humble bowers to lay me down:
To husband out life's taper to a close
And keep the flame from wasting by repose.
And as the hare when hounds and horns pursue
Pants to the place from whence at first it flew,
I still had hopes my long vexations past,
Here to return, and die at home at last."

TREATMENT OF FARM ORCHARD AFTER FIVE YEARS.

A. W. LAWRENCE.

It seems hardly probable that Secretary Cranefield associated this topic with a farm orchard of my ideal. My conception of a farm orchard would be one consisting of just trees enough to supply the home with an abundance of seasonable fruit. An orchard of not more than twenty or thirty trees, and these located near the house would, if set out about thirty feet apart either way, make an ideal place for the garden. Although having nothing to say about the garden, I take it for granted you will have one of which you will justly feel proud, one well fertilized and with plenty of humus in the soil. Let us put the rows of garden truck far enough apart so as to allow of cultivation with the horse, for this will insure more thorough cultivation. If a cover crop were grown the latter part of the season on the strip where the early potatoes, green peas and such like were taken off, it would also be advantageous to the future crops and trees. In the fall each year, just before it freezes, do not neglect to make a little conical mound of dirt around each tree, to the height of about six or eight inches. In the spring before the farm work becomes urgent, give the trees what little pruning they may need, for this, if attended to each spring, will mean but a few

minutes labor. After this the small spray outfit should be made use of each year, to the extent of at least one dormant spray, one part lime and sulphur to ten parts water, before the leaf buds show their green. As you can buy the commercial lime and sulphur already for use, with the exception of its dilution with water, it makes a very small job. One more spraying each year after the tree leaves out, will in all probability suffice until the trees commence bearing. After this and until the close of the ten year period give them their yearly pruning in the spring and with their fruit now in evidence add to the spraying, using the latest spray calendar as a guide.

Possibly this may be changed from time to time as brains and science are certainly awake along these lines. For farm use I would advise the use of the simplest spray mixture that is efficient, and certainly at the present time the lime and sulphur comes the nearest to filling the bill. Use 1¼ gallons lime and sulphur in conjunction with 2 pounds Arsenate of lead, diluted in 50 gallons of water, for the three later sprayings.

Possibly after the first six or seven years, for the farm orchard, it would be as well to advocate the sod system, if the grass would be mown at least four times and all left on the ground, and in addition a liberal amount of old straw placed each year, around and under the entire branching surface of the tree. This would undoubtedly be more feasible than the commercial plan of thorough clean culture with a cover crop in the fall, and would in most sections be a marked improvement over the slipshod methods now certainly in evidence over our great commonwealth.

One thing that I feel is of great importance to any orchard, and might be added to the treatment of this one on the farm, is the care necessary to keep the ground level, not allowing the dirt to get worked up higher around the trees than it is in the center of the spaces.

THE FARM ORCHARD—TREATMENT AFTER TEN YEARS.

J. S. PALMER.

An orchard, after a farmer has had the mismanagement of it for ten years is usually little less than a crime, and about the only treatment I could recommend would be to grub it out and put it out of its misery.

But *this* orchard seems to be an exception to the rule and after the osteopathic treatment it has received at the hands of Brother Lawrence, should be in perfect condition, every tree in its place and producing about one barrel per tree, or 75 barrels of No. 1 fruit per acre—showing a net profit of $200.00, equal to the net profit derived from any other 20 acres on the farm. This is an argument that will appeal to the farmer, more than all the smooth talk handed out by the Horticultural Society, the nursery man and the tree peddlers in all Wisconsin. The probabilities are that he will develop into a first class commercial fruit grower, plant out a large orchard and be happy ever after.

Cultivation in an orchard is as essential as in a cornfield and the soil should be in about the same condition for one crop as for the other. By proper cultivation and cropping, the fertility of the orchard can, in a great measure, be maintained, but the application of fertilizer will be necessary, as the removal of the enormous crops of apples this orchard will produce in the near future, must take a good deal from the soil. I have had no practical experience with commercial fertilizers, but there is fertilizer out by the barn that answers every purpose and I have never seen any bad results from its liberal application to a bearing orchard.

The best cover crop to grow in an orchard is clover. There seems to be something about the clover plant that will put the soil on which it is grown in the best condition, and one season in clover, after thorough cultivation, will load these trees with apples, so they will have to be propped to prevent breaking down. Cut this clover in July and let it lie for a mulch. On this mulch apples will drop with a minimum of injury, and in our climate, where the picking season is short,

this is an important feature. We have never been able to raise all No. 1 apples and the lower grades must be utilized if we are to get the best results from this orchard.

There is always a market for windfalls. We can often realize enough from this fallen fruit to pay the expenses of the orchard, but if they are allowed to fall in the mud, they are of little value.

Mr. Flanders: A near neighbor of mine had a small orchard which was separated from mine by but one lot. In the early days we had no difficulty with codling moth, and the codling moth infested his trees at least three years before they reached mine, with just a distance of one block between us. It confirms me in the view that the codling is not a fast traveler, but is easily controlled. There is another point I wish to speak about. One of the gentlemen rather be-littled one of my favorite varieties of apple, the Transcendent crab. My experience is somewhat different from his views. I have a Transcendent crab tree standing in my yard and it has been bearing apples for thirty-three years, never has had any disease, never has failed to bear. The year before last I took twenty round silver dollars out of that tree after some three or four hundred school boys had all they could get hold of and all our neighbors what they needed and all our family. The tree is probably as healthy a tree today as there is in the state of Wisconsin. It never has been sprayed, never has been cared for. In fact, my trees have been raised after the fashion of the old moss-back farmer, I set them down wherever I happen to find a good place that I thought they would be out of the way. I set out ten trees and in the last twenty years, without any spraying, pruning or cultivating, we have averaged about forty bushels of apples a year. It may be on account of our climatic conditions, I think we have a good climate for apple trees. Of course my experience does not extend very far out of my district, but it seems to me that there should be two sides to this question.

Mrs. Howlett: I should like to say a word from the farmer's side. We as farmers are not as indifferent to the subject as you might infer from the remarks here. We have discussed this subject in our societies and we have come to the conclusion that it is a good chance for farmers to co-operate, because every farmer who has just a few trees does not care

to go to the expense of buying an expensive spraying outfit, but we do think that by co-operating and hiring some one of our members to do the spraying in the neighborhood that we will reap great benefits.

Mr. Palmer: In regard to the Transcendent, I know a tree that has stood for thirty to forty years right in the dooryard until last year, and it is the only tree that I know of anywhere in our locality that had not blighted itself to death, or nearly so.

The President: The general trend of these papers has been along the line of the small farm orchard of from twenty to thirty trees. Has anybody anything to say on the other side of this question? Is this the consensus of opinion? We want to get here the general impression so that we can have something definite, some conclusion to come to.

Mr. Roe: In regard to the size of farmers' orchards, I have found in late years while buying fruit from the farmers that the larger farm orchards are not paying. I do not know why, but they are falling back, but where they have a few trees planted around the house they seem to take better care of them, and they seem to be getting better results than they are getting in the larger orchards.

Mr. Larsen: This matter of farm orchards the same as all other horticultural subjects, is a matter of education, and I think a great deal could be done if those that are interested in these matters in various communities would take it up. For instance, there is no reason why the young people growing up nowadays should not know what varieties may be raised and with what varieties it does not pay to trouble. As a matter of fact, I think it is not the nurseryman, but the agent, that largely determines what the farm orchard is. The agent comes around and succeeds in selling the farmer trees that are not adapted to his locality and we find in these farm orchards all kinds of trees, some do not grow, some do not bear and some are not profitable. If we could, in some way through our schools, through our farmers' clubs, through our Farmers' Institutes and other agencies get the people to understand what varieties really are worth while, what varieties have been tried, instead of letting the apple tree agent go around and sell to the farmer largely from pictures in the book, we will have better farm orchards to start with.

Mrs. Howlett: This gentleman advised cultivating an orchard and then seeding it to clover. I should like to ask if you have an orchard that is well sodded after ten years, has quite a good sod mixed with clover and tame grass, whether you would advise breaking this up?

Mr. Palmer: If I had an orchard in sod, I should advise getting the sod out of it just as quickly as I could. I would only have clover one year. The worst condition we can have in an orchard is to have sod, even with mulching. Mulching will kill out some of the sod perhaps, but the trees cannot do much in a heavy June grass sod, such as we get in Wisconsin. I would get it out as quickly as I could. After it is once removed and cultivation has been thorough, then one year in clover, with the clover for a mulch, will be all right.

Mrs. Howlett: What would be the best way to get rid of the sod?

Mr. Palmer: It can be done in several ways. Probably the best way would be to plow it under. It could be cultivated out with a spring tooth or with a disc by continuous cultivation all summer. In that way we would get rid of the sod, but if it has long been in sod, I would plow it out; not plow deep so as to injure the roots of the tree, then cultivate thoroughly and cross plow. If there is anything I do not want in an orchard, it is June grass.

The President: There is one point in connection that I should like to bring out and that is why do you advise clover for only one year?

Mr. Palmer: Because in our climate, we cannot keep clover clean more than one year, we will get June grass, the clover will run into a sod. I think clover has a great deal to do with making an orchard bear by slightly checking the growth. continuous cultivation will make an enormous growth in an orchard and by seeding in clover and letting it be in clover and clover mulch one year would check the trees and get it into bearing. A ten-year old orchard is old enough to bear.

A Member: What do you seed your clover with as a nurse crop?

Mr. Palmer: I should sow clover alone without any nurse crop. Work the soil up in good shape in the spring with the harrow, then sow clover without any nurse crop and it will make a good growth, then mow it off soon and leave it for a

mulch. Mow it in July, leave it for a mulch and next spring work it into the soil.

Mr. Ames: What varieties would the commercial orchardist recommend for planting, say, a ten-acre orchard?

Mr. L. H. Palmer: This is a pretty deep question and we change it so often that it is rather dangerous to say anything about it. The most I can say is to tell the most profitable varieties we have had in our country the past season. Probably the Wealthy and the McMahan have done as well as any trees we have. I am afraid we are coming to some disappointment in the McIntosh. The McIntosh was one of the best, but it has lost with us. It is not much later than the Wealthy with us and does not keep as long as we had hoped it would and it has some other bad points. The Fameuse up in our country this year has done the best probably of any tree we have. The fruit is very nice, the color and size are just right and they are late enough so as to come into a very good market. Of the later apples, we have one that I think is very promising, and that is the Windsor Chief, a winter apple. I do not know of anything, as far as we have gone with it, showing any more promise than the Windsor. I have a Windsor ten years old and so far they have been hardy. I have been giving them the best conditions to cause them to blight and they are not blighting as bad as the Wealthy under the same conditions.

The President: I should like to ask Mr. Lawrence what he thinks of varieties for a ten-acre orchard?

Mr. Lawrence: For Northern Wisconsin and the lake shore counties, I would probably consider the Wealthy as best, the the Snow and McIntosh and Dudley. There are others, but those are probably varieties enough. If you want a winter apple, Northwestern Greening has been exceedingly good with us and the Talman Sweet is a good winter apple for smaller planting. We are planting considerable of the Duchess.

Mr. Thompson: Would it be necessary to plant more than one variety in a ten-acre orchard for pollenizing?

Mr. Coe: So far as I know it is not necessary. There are some varieties, however, not grown in Wisconsin to any great extent, that are not self-fertile but of the commercial varieties grown in Wisconsin I do not think there is any objection to planting ten acres in one variety.

Mr. Roe: I should like to ask some of these commercial orchardists if there is any money in planting some very early eating apples?

Mr. Palmer: The great trouble with the Yellow Transparent and some others, they will not ripen even enough. You have to keep picking, picking all the time. If you leave them ripen, they will fall off while the others are getting ripe. It is a double expense to handle those apples on that account. Then they have to be handled very carefully and put on the market carefully in order to get good results.

(MR. TOOLE IN THE CHAIR.)

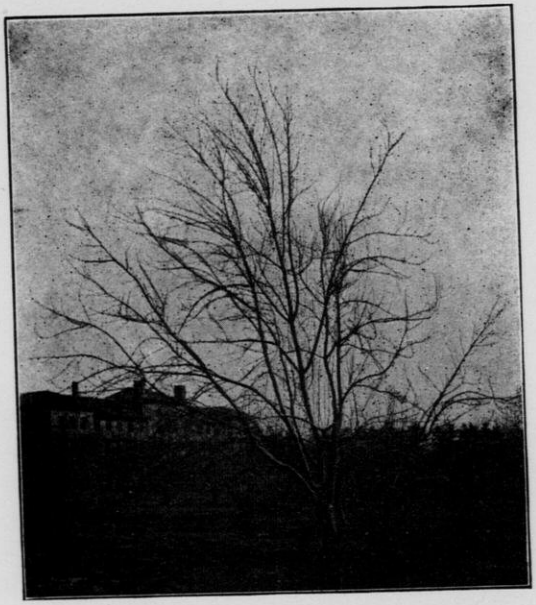
HORTICULTURAL METHODS IN THE EAST.

PROF. W. S. PADDOCK, COLUMBUS, OHIO.

Prof. Paddock: Speaking of farm orchards, the farm orchard is the curse of horticulture in Ohio. In a year like this, when the average farm orchard has yielded a large crop of fruit, apples will be dumped on the market, many of them affected by the scale and apples inferior in quality, thus spoiling the market for well grown apples from sprayed and well cultivated orchards. The farmers' orchards are gradually dying out from neglect, being eaten up by scale and disease.

THE NEW HORTICULTURE OF THE EAST.

Most of the intelligent people of the nation have heard in one way or another of the famous orchards of the intermountain states and of the northwest. The boxed apples from those sections are familiar sights in retail stores, and the children have come to know that the large red apples of the fruit stands which they long to taste, come from that fabulous country—the far west, and this leads me to say that the idea fixed in this and in similar ways in childhood is not easily dispelled in later years, consequently, a large proportion of each succeeding generation is schooled in the notion that the eastern fruit is of inferior value.



Pear tree in need of pruning.—Paddock.

A well-formed apple tree.—Paddock.

All must concede that as a section the west leads the world in the production of fine fruit. In no other section has fruit growing been developed along such intense lines. They have learned many things in regard to general orchard management that are new, and for this due credit should be given. In the meantime eastern growers should not be jealous or prejudiced, but should be willing to learn and ready to adapt western methods to their conditions insofar as they will apply.

It might be well at the outset for us to analyze western methods and see if possible wherein western orchardmen have been able to establish their enviable reputation. It is true that their horticulture is not so very old, and we may be sure they made many mistakes in the beginning, but their development has been very rapid, so we now find that their practices are fairly uniform and their business is becoming stable. One of the first things that one notices is that the western people have learned to adapt varieties to soils. Thus we hear of a Jonathan section, a Winesap section, Esopus section and the Yellow Newtown section. This means that certain localities, or restricted regions, are making a speciality of these varieties which they have found by experience to do remarkably well under their conditions. Even in the same neighborhood the distinction is made between the heavier lands of the bottom and the lighter soils of the mesa. Then we notice that in all the newer orchards only a few varieties are planted. The grower knows in advance that his fruits must go on to the markets of the world and under these conditions large quantities of a few staple varieties are wanted. The old-fashioned show orchard of many varieties has no place in the west.

We next notice that in the matter of cultivation great care is given the western orchards. This is a feature in orchard management which may be overdone and we believe that in some sections, the western fruit growers have worn out the soils in order to give clean cultivation. However, they are learning that clean cultivation is not all there is to soil management, and are turning their attention rapidly to green manures. But whatever system is finally adopted we may be sure that it will be developed for all that it is worth.

In the matter of pruning and training, much attention is given the trees and gradually, systems are being evolved which are adapted to the different conditions that are found

in the various localities. These people soon learned that low headed trees possess many advantages. It would probably have taken the eastern growers many years to have come to this conclusion had not the San Jose Scale fortunately appeared on the scene. The methods of training trees have not yet been fully worked out as one can see by the discussions in the western fruit journals. However, this is a subject that is receiving much attention, and no doubt, well established systems will soon be evolved. The thinning of fruit is another practice which insures a high grade product. This has not been neglected, and is found to be an important element in their success.

I presume that the western man has more reason to be proud of his success in spraying than in any other one thing. In many sections the common fungous diseases of the east such as Scab, Bitter Rot, and Arkansas Blotch are unknown. But other pests are prevalent and in much greater numbers than we ever see them here. Take for example the one insect, Codling Moth. This is a most pernicious insect under semi-arid conditions and if left uncontrolled will usually infest an entire crop. In the beginning of their spraying experience, large quantities of poison were used and many sprays were applied during the season, but still a large per cent of wormy fruit was given in tribute each year to this insect. The entomologists, however, of the various experiment stations have been insisting for many years that fewer sprayings and more thorough application would bring better results. Professor Gillette of Colorado early advocated that the first spray, as soon as the petals were mostly off the blossoms, was the important one, reasoning that if this spraying was well done that most of the insects would be killed, and hence, there would be a small second brood. He was able to demonstrate in actual orchard experiences that his theories were correct. A little later it was determined that the poison which fell upon the ground during the process of operation was the cause of the death of many orchard trees. This lead to the trial of sprays which were weaker in arsenate and of one spray for the season for this pest instead of 8 or 10 as had been given by some. Professor Melander of the Washington Experiment Station has recently published some figures on the spraying for Codling Moth which are very interesting and deserve

careful consideration. As a result of his teachings a number of Washington fruit growers have tried spraying but a single time during the season for the Codling Moth. By tabulating results obtained by a number of orchard men in that state he has figured out the percentages of wormy apples and the number of times sprayed as follows:—

	Growers.	Sprays.	Wormy.
1909	19	1	2.1 %
1909	17	2	7.75%
1909	5	3	23. %
1909	5	4	6.7 %
1910	21	1	.73%
1910	10	2	2.24%
1910	10	3	3.64%
1910	13	4 to 7	8.42%

It is thus clearly shown good spraying has no relation to the number of times the trees are sprayed, but rather a man must understand the life history of the pest he is spraying for and he should become impressed with the notion that only thorough work counts. It strikes me that after observing home grown fruits on the markets of the east, that one thing we need to learn above all others in fruit growing is the art of spraying. We have been dabbling with it for many years, but I am convinced that there are only a few men who actually spray thoroughly and to the best advantage. We have numerous pests, both insects and diseases, and it will not do to be satisfied with having even a few scabby specimens or those that are otherwise blemished appear in our packages of fancy fruits. We must get over the notion of thinking that the consumer will regard such blemishes as being characteristic of the variety. It is enough for us to know that all blemishes detract from the appearance of our fruits and we should constantly compare its appearance with the very best that comes from the west.

Another feature of orcharding that has been well looked after in the west is that of marketing. It is difficult for us in the east to get together on any sort of marketing schemes for the reason that we can always sell our product for some price. I often tell my students I think it would be a good scheme if we had to ship our fruits to California for a few seasons. We would then be compelled to learn the art of marketing as our western neighbors have been compelled to learn, and it cer-

tainly would be to our advantage. Since the western men have been compelled to combine in marketing they have developed the plan for all that it is worth, and we now find them successfully invading the markets of the world. At the same time eastern fruit may be going to waste, fruit that is perhaps superior in quality, and with little attention to cultural management, it is the equal of any in appearance. A study of the Fruit Growers' Marketing Association of the west would do all of our farmers and fruit growers much good.

Along with the selling of fruit goes the question of advertising. No doubt one of the reasons why the western fruit is well advertised is because of the fact that they have fruit lands for sale. But no one can doubt that demand is created when a name such as "Hood River" is constantly brought to our attention and always associated with elegant fruits.

Judging by the western standard we of the east have many things to learn, but our condition is by no means hopeless. A few growers here and there are adopting western methods and as a consequence are reaping western rewards. As a case in point I may mention an incident that I picked up at the New England Apple Show. I was struck with the fine appearance of a display of McIntosh boxed apples. These apples were the equal in appearance of the fruit and the style of pack of any that can be grown anywhere. Upon inquiry I found that the grower had four acres of seven year old trees of this variety. These trees yielded 1100 bushels, over 90% of which were extra fancy, and when rigidly graded and packed in boxes brought the grower the handsome sum of $3.25 a bushel. Among the barrel displays there was one particular fine lot from New Hampshire. A great deal of pains had been taken in grading and packing, and when they were examined by a dealer he readily paid the grower $10 a barrel for the lot. In contrast with this lot, a majority of the other barrels which were entered in the same class in the big show were graded and packed in the usual style, that is with nice apples on top and inferior ones in the center.

In the handling of orchards in the past "neglect" has been the rule, but in the new horticulture the growers are recognizing that they have engaged in an intense business. Our horticulture must be largely revolutionized, and we should be ready to adopt western methods insofar as they are ap-

Neglected pear tree pruned back or "dehorned."—Paddock.

Neglected trees soon get in this condition; thin out the brush.—Paddock.

plicable to our location. We have the advantage of the nearness to large markets, and moreover, in most of our states there are many thriving small cities which will use large quantities of produce, and the home grown stuff will usually be preferred if it can be secured. It all too often happens that eastern cities which are located in orchard centers are for some reason not supplied with home grown fruit. A case in point is that of the city of Rochester in New York. This fine city is located in one of the famous fruit regions of the United States. No finer Baldwins, Greenings, Russets and Northern Spys can be grown anywhere. Yet the city people have been unable to buy choice home grown apples which they much preferred to the strange varieties which were offered them from distant states. This conditon has been so marked that an investigation was made by the City Chamber of Commerce with the result that an Apple Show has just been held which has for its main feature the getting together of the city consumer and the country producer. A similar condition obtains in many localities and suggests the necessity of co-operation in marketing. A local market is always best for the grower who has any of the qualities of a salesman, but if he is not located close to a large market he probably will have to depend upon the markets of the world, and so is largely at the mercy of the traveling buyer. Unorganized methods of selling usually result in low prices, and this in turn results in lack of care and finally in poor fruits. A good marketing system invariably results in better orcharding, better quality, better grades and better prices.

The new fruit grower of the east, or the man who can adapt himself to the changed conditions, will, if planting a new orchard, pick his location with care. He will locate with regard to air and soil drainage and he will give up the notion that the waste places of the farm are good enough for orchard trees. He will know that continuous cropping to fruit takes more of the elements of fertility from the soil than does continuous cropping to grain. Some system of culture will be adopted which will keep an abundant supply of organic matter in the soil, and the moisture supply will be conserved to the best advantage.

After the location has been decided upon, the choice of varieties will next engage the attention. If a local market is

to be catered to, more varieties may be used than is the case where distant shipments are to be made. The planter will be sure that the varieties selected will be adapted to the region and to the soil. He will know that the Ben Davis and its associates, such as the Grimes, Winesap and Jonathan will not succeed as a rule in a region where the Wealthy thrives best. Short seasons require quick maturing kinds and such kinds become fall or early winter sorts in regions of longer growing seasons.

Nursery stock will be selected with care and the prospective planter will take the time and pains to inform himself on the general subject of fruit growing so that he will not be influenced by the wiles of irresponsible tree agents. No doubt many of you have heard the familiar story of trees that have been propagated in some mysterious way or upon some hardy stock, and possibly some of you have been induced in this way to pay 75 cents or a dollar a tree for inferior stock. One soon learns that it is best to deal directly with the nurserymen or with a resident dealer. It makes but little difference where stock is grown so long as it is well grown, but it must be true to variety and free from insects and diseases.

It is of little use to go to the expense of planting an orchard unless one knows something of plant growth. The up-to-date fruit grower will know how plants grow, how they take their nourishment so that mistakes in culture will be less common. He will know how to distinguish between fruit buds and branch buds, and so will become a skillful trainer and pruner. Training must be begun when the tree is young if we are to make the most of the trees, and it should be continued through the first three or four years when pruning proper begins.

Added to these operations are the details of cultivation, fertilizing, spraying, thinning, picking, grading, packing and marketing. Then there is the subject of by-products, the utilization of which has come to mean so much in the handling of many kinds of business.

Time will not suffice to go further into details, but when we come to take account of the many intricate sides of fruit growing, all of which must be developed to the fullest extent if we are to meet successfully increasing competition, it begins to look as though fruit growing is an intricate business.

If one is the fortunate possessor of a mature orchard and it has been neglected he will proceed at once along modern lines to renovate it and put it into shape for profitable bearing. Pruning will be the first consideration. The limbs will not be denuded of branches from centre outward, leaving a matted tangle of brush at the tip ends, but rather by judicious thinning, bearing wood will be left on all suitable portions of the tree. The trees will now be ready for spraying if scale is present, and if not, everything will be gotten in readiness for the coming season's campaign. This does not mean that the equipment and materials alone are to be made ready, but that the man should receive the most attention. He must make up his mind that more thorough and intelligent work must be done, and to this end many a long stormy day or winter's evening may be put in to advantage in studying Experiment Station bulletins and other similar publications.

The cultivation of orchards is a vexed question at the present time, but if the old orchard has not been bearing satisfactorily some means should be taken to improve the soil. Cultivation with cover crops is generally conceded to be the best system, but in some special locations a sod mulch may be employed. This does not mean that the land is to be neglected, but that all the herbage that grows is to be returned to the soil, and if the system is to be a complete success this material must be reinforced with liberal amounts of stable manures, straw or other similar materials.

It is evident then that most of our eastern growers will be compelled to make radical changes in methods of management and in their mental attitude if they expect to keep abreast of the times. A few men here and there already measure up to these standards, but until a majority can do so our principal supply of choice fruits will continue to come from the west as is the case at the present time. And I have faith to believe that when the many men who simply own a few trees are put out of business by San Jose Scale so that our markets are not demoralized by inferior fruit our horticulture will present an entirely different aspect. This condition will naturally result in the business being carried on in a businesslike way and this is all that is necessary to make our horticulture the equal of any.

Mr. Roe: I should like to ask the Professor to explain the figures on spraying. I understood him to say that one third of a spray, according to his figures, is better than subsequent spraying, that the more you spray the worse the results.

Prof. Paddock: That was right. This Professor in Entomology, Professor Milander in Washington State, where these figures were taken from, had corresponded with a number of the good growers there and got those figures where they kept accurate measurement. He found as the result that the fellows who sprayed only once for codling moth had much better results than those who sprayed five or six times. The reason was that these men who were spraying just as the petals were dropping and who sprayed but once, knew that everything depended on that one spraying and they gave the best attention to that particular spray. If the calyx of the very little apple is filled with poison, seventy-five per cent would get that poison and enough would be lodged on the outer portion of the fruit to insure a large per cent of the remaining twenty-five per cent. So that if the first spraying is thoroughly done under Western conditions, it has proven to be superior to spraying more than once, particularly the spraying that the average man will do, not placing so much importance on the first spraying, he would not do any of his spraying so well as he would do it otherwise. Whether that would work the same under our conditions, I do not know.

Mr. Ames: Would you advise using wood ashes as a fertilizer?

Prof. Paddock: Yes.

A Member: Is there a large difference in the age of the trees planted in the West and those in the East?

Prof. Paddock: We in the East like a two-year old tree, that is, we want a large nursery stock. There is scarcely a tree of any description planted all over the West over one year of age. I am interested in an orchard and had charge of planting it, some ninety acres, and there was not a tree that was over a year, and they were all grown down in Alabama, they all grew remarkably well, and we can put the head on that tree exactly where we wish, that is the idea. I do not care to plant anything older than a year, any kind of tree, a good, well grown yearling.

THE HOUSE OR TYPHOID FLY.

PROF. F. L. WASHBURN, STATE ENTOMOLOGIST, MINN.

It is well to realize in dealing with this subject that little flies do not become big flies; that a fly, or any other insect for that matter, never grows in the perfect or imago or adult stage; that when we see on the window-pane flies of different sizes, the little ones should never be regarded as the young of the large ones, but as representing different species.

We are just realizing what a dangerous pest the house fly is. It is now called the "typhoid fly," though it is well understood that it is not the only insect, nor the only fly, which may carry typhoid, and that if all flies were destroyed we still would have epidemics of typhoid. The name, however, has served to call attention to its dangerous character, all the more dangerous because we have tolerated it so long in our ignorance of its true nature.

In taking up the subject of "The Typhoid Fly" the following questions present themselves:

1. Kinds of flies common about the habitations of men.
2. Varieties or species which are likely to enter houses, and having entered houses, to infest exposed foods; also the species likely to enter shops to infect meat as well as groceries and fruit exposed to their approaches.
3. Species infesting stables where cows are kept, or horses, or both; where the different kinds breed; their powers of traveling both by their own efforts, and by being carried.
4. Of those infesting houses and stables what species carry germs, and how.
5. What flies frequent human excrement, and what flies breed in the same.
6. Of the flies that do this how many are found in houses and on food.
7. Rate of multiplication of flies.
8. Hibernation of flies in houses, stables, etc.

Methods of prevention: (a) Prevention of breeding, (b) Screens, fly papers, poisons, etc.

Without burdening you with scientific names I will say that the flies we find about human dwellings, towns and villages, camps, etc. are the following:

First and foremost in abundance and in persistency, the common house or typhoid fly; second, the window fly, found on the window pane in connection with the house fly, and considerably smaller; the stable fly, especially obnoxious about stables and entering houses in the fall. This is the fly that, resembling the house fly closely, bites or stabs us, and has given rise to the erroneous impression that the house fly bites. Further, the blue-bottle fly, the apple or pomace fly, the cluster fly, the non-biting stable fly, the lesser blue-bottle fly, the green-bottle fly, and one or two others of less abundance. Nearly 100% of these is represented by the common house fly. All of these may and do enter houses; all of them may crawl over fruit and other exposed food. Any kind of meat would attract the house fly, and all the flesh flies, or blow flies. Almost, if not all, of the above would be attracted to garbage and other filth. In stables where cows or horses, or both are kept, one would find the stable fly and the house fly abundantly and other species sparingly.

It is a well established fact, as you know, that the house fly breed particularly in fresh horse manure; to a slight extent, evidently, in cow manure; in almost any moist filth; to some extent in garbage, and, most significant of all, in human excrement. Composing as it does at least 90% of the above mentioned flies, it is, therefore, the chief carrier of disease.

Turning then to the house fly, the chief violater against public health, we find the following well established facts:

Each female fly lays from 120 to 150 eggs; these eggs hatch in from eight to twenty hours, depending upon latitude and climatic conditions. The larva or maggot lives from five to seven days; the pupa the same. In other words, it takes about twelve days for one generation. It may hibernate in the pupal condition, either in manure, or on the surface of the ground. It also hibernates in the house or barn as an adult. There may be from twelve to fifteen generations in the course of a summer. Dr. Howard, who has done much work on the house fly, found in a quarter of a pound of well infested horse manure on August 9th, 160 larvae, and 146 pu-

paria of this fly, or about 1200 house flies to a pound of manure. We have had some interesting figures prepared, showing the tremendous fecundity of this pest. A full grown house fly, the female hibernating in the house, will produce in the spring, at the lowest estimate, 120 eggs. Assuming that one-half of these will be females, and allowing the breeding to go on without check for four months, we have this enormous number as the progeny from one hibernating house fly, namely, 214,557,844,320,000,000,000,000. Now then, an adult house fly measures exactly one fourth of an inch long. The distance around the earth at the equator is said to be 24,800 miles. Allowing 5,280 feet to the mile, it would take 3,688,312,000 house flies placed end to end to go around the world once. Using this number as a denominator, and the number of flies produced in four months from one mother as a numerator, we find that she will give rise, in the course of the summer, to enough flies to encircle this globe fifty times or more, and have plenty of progeny to spare.

It is difficult to determine the length of life of the adult fly, for as soon as we confine insects where they can be observed, we place them under such unnatural conditions that the observations are not to be relied upon.

As regards its powers of locomotion, and method of transportation, we cannot speak definitely as to the distance a house fly can go by its own unaided efforts. It is evident, however, that by making a series of flights this insect could cover a considerable distance. It, nevertheless, does not have to depend upon its own power for getting from place to place; railroad cars, street cars, horses and other animals, carriages, automobiles, provision wagons and meat carts, all do their part in carrying this pest free of charge. We have seen countless flies on an empty fish box in a wagon carried along for several blocks. We have also noted house flies on horses being driven in the country, attracted, undoubtedly to the horses by the smell of the stable, carried possibly a mile. The same can be said of flies in a carriage, and all of us have doubtless seen provision carts going their rounds attended by swarms of these uninvited passengers.

The house fly can and does carry germs on its feet, and on the hairs over its body, and in its intestine. Many of these are disease germs, and that they may live after passing

through the intestine is proven by finding living bacilli in fly specks.

That flies may come from filth to human food has also been proven by scattering lime on human excrement, and noting that the flies which have walked over that, and colored their legs with this substance were later observed in human food.

We have stated conditions under which the house fly breeds. It is well, perhaps, to also state that it has been quite established as a fact that it will not breed at all in dark places, and only to a very limited extent in a poorly lighted place. These are facts brought out by some recent experiments of Felt in New York state.

Of the diseases transmitted by the different kinds of flies I speak with some hesitancy, but I believe it has been established beyond question that it is absolutely certain that they may transmit; typhoid, anthrax, ophthalmia, tuberculosis, and it is further claimed that they may carry the typhoid bacillus in a living condition for over two weeks. Of the diseases which it is probable they transmit, or may transmit, the following have been suggested: Conjunctivis, cholera, leprosy, the parasite known as "round worm," dysentery, septicemia.

At the close of his paper, Prof. Washburn gave a description of a flytrap, submitting a printed circular in which full descriptions and illustrations are given, the same being Circular No. 22, July 25, 1911, issued from the office of the State Entomologist, St. Anthony Park, Minnesota.

Prof. Moore: We all do all we can to get rid of the flies in our homes, but how will it be in the depots of the railroad companies, in hotels and restaurants where it is more important that they should get rid of the flies because people are going from one place to another and they spread the disease and that is the way it is carried to our homes?

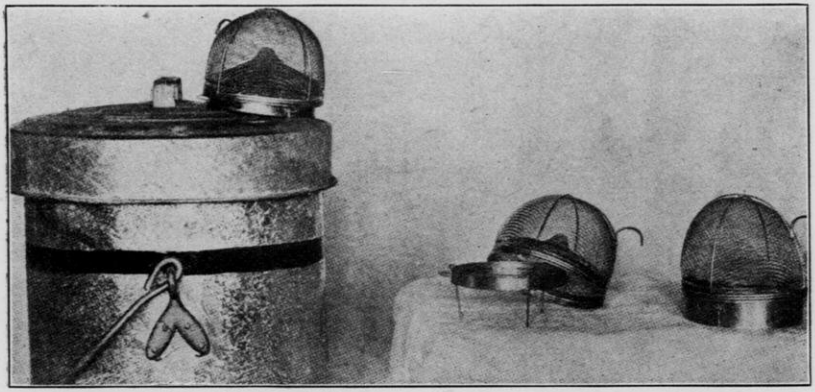
Prof. Washburn: I think undoubtedly it will come in time. We are all being educated along these lines and the time will come when there will be legislation.

A Member: Do you know of any case or instance where hotels or depots were doing anything to get rid of flies?

Mr. Washburn: No good hotel will allow a fly inside of its rooms. You should give that hotel a wide berth that does not keep flies out of its dining room.

Stable flies caught over one cow in one day, August 22nd, 1908.

What any boy or girl might rig up. A good sized bait box for those who have no garbage cans.



The Out-Door Fly Exterminator, finally adopted and now on the market. On right, attached to garbage can; middle figure shows ring by which it is attached to can; left hand figure attached to its own large bait box. Flies can enter trap from top of can, or cover of can may be made to fit loosely, allowing flies to gain access to garbage and thence enter the trap through opening in cover.—Prof. F. L. Washburn.

Mr. Pellett: Soon after reading Prof. Hodges' experiment in regard to catching flies, I went home and made a square frame, covered it with a remnant of wire screen, which cost about five cents, fixed a cone to the under side as Prof. Washburn has explained and set it in our kitchen door and it was surprising the number of flies that entered that cage and we shortly after had very little trouble with flies in the house. Some one put one in front of a store in town and it was not a week before the flies caught could be measured by bushel baskets.

Mr. Burrill: There is a book that has recently been added to the Madison Public Library, in which the Superintendent of Health at Providence, R. I., takes us entomologists to task for holding the house fly responsible for a great deal that it is not responsible for. He acknowledges that in the Spanish War typhoid fever was transmitted by the flies, but he claims the human race is still more responsible. That is the first authentic rebuff that the entomologists of the country have had, I believe, from another scientist in that line. He does not deny that the house fly spreads disease and he winds up with the conclusion that it will do more good than harm, because in cleaning up the house fly we will clean up a whole lot of other things, some of which are too well known at the present time, but this idea of getting people started is a great thing.

THE NAME AND THE GAME.

By William Toole, Baraboo, Wis.

Probably most of you at some time or other, have heard some one say, "If I have the name I may as well have the game," such expression generally following mention of some uncomplimentary rumor or accusation. It is something of a shock to think that anyone would choose to live down to some lower standard, rather than strive for a better life, and yet there are probably many who follow a downward course, because of the impulse of an unkindly attitude toward them. We love to think that we ourselves are choosing a name that is worthy, one which indicates exalted aims, and we may well

consider whether we are living up to the rules of the game, which is implied by the name, or the reputation which we assume. Perhaps there is no definite thought in our mind, that the stand which we take in society, imposes on ourselves obligation to live up to any definite ideals, yet we would be very jealous of any intimation, that we may not be worthy of the reputation which our acquaintances accord us. It is true that there are many who are satisfied to have acquired a name without having earned it, as we note that there are some who endeavor to secure their college degrees with as small a measure of intellectual effort as will carry them through.

If all participants in baseball played strictly to the rules of the game, there would never be any risk in being umpired; and if all players in football were true to the spirit of the rules of the game, there would be much less danger of those who strive for honors on the gridiron.

There are certain qualities of mind or character with which the world credits the horticulturist. If a lover of flowers, he is supposed to be generous and kindly, with high ideals. If a lover of fruit, then the world expects an accompaniment of temperate inclinations, and habits. If our lives do not accord with these ideals, we are not living up to the rules of the game, and our name is not a credit to those with whom we class ourselves. We will not look around to see if we can find in the conduct of others, misfits according to these rules of the game of life; rather let us look within ourselves, to see if we are living up to the standards which we assume, when we accept a desired reputation and it behooves us to give heed that we have studied well the rules of the game. The scholar, to pass examinations and secure his degree, must give evidence before he receives his diploma, that he has acquired knowledge in certain lines. Might not we, with advantage to all concerned, make a study of the ethics and amenities of intercourse with our fellow men, or better still, treat ourselves to a periodic examination of conscience, as do the members of a certain good Christian sect? In that case, instead of considering sins of pride, wrathfullness, sloth, envy and other of the deadly sins, I might, as a worthy horticulturist, ask myself, if I have kept my hens from my neighbor's garden; have I allowed weed seeds to wash or blow from mine to my neighbor's fields; have I planted trees on my line next my neighbor,

that his land shall help to yield profit to me; have I harbored insects or plant diseases, that might become a menace or injury to others; have I been as ready to share with others, as I have been to accept, the good things of life; have I been generous with flowers to the sick or shut-in, or selfishly kept to myself the abundance that might have been shared with others; have I been negligent in caring for the nursery stock I have bought, because of the promise to replace; have I been reckless in giving advice to the inexperienced, perhaps giving them cause to regret the possession of too many trees, of such varieties as Borsdorf, Longfield, Hibernal and Repka; if in the trade, have I been as careful of the roots of the stock delivered as of the appearance of the tops; have I been too ready to take advantage of the dealer's disclaimer of responsibility, and not used due diligence in endeavoring to furnish customers with what they have bargained for?

At the State Fair a visitor was making inquiries about the relative value of varieties. He was advised to make a study of conditions in his own locality, and choose varieties which had proved suitable there, for it is very important to make a good selection. He replied that it is more important to be able to get the kinds you order. There are many other things that might be considered in the line of what constitutes a good horticulturist, and not the least, is the quality of fruit we put on the market. We criticise the use by the other fellow, of red netting, which gives green peaches a luscious appearance, yet others may be as much disappointed in our apples, or berries if we have not done honest grading and packing.

And we may ask ourselves, if we have played fair with our State Horticultural Society, and given good measure of help for the benefits received. Have we given it the impulse of our enthusiasm, sustained by constant loyalty to the cause of Wisconsin Horticulture? Having considered some of the qualifications of an ideal individuality, for the members of our State Horticultural Society, may we not as well give some thought to the individuality and desirable characteristics for our State Horticultural Society as well?

If we consider retrospectively, the history of our society, and make comparisons with like organizations of other states, we have reason to be satisfied with our standing among kindred societies and yet it is well to consider if we have, at all

times, given evenly balanced attention to the various interests which the broad subject of horticulture represents. It is proper that fruit culture should receive leading consideration, for the history of the work of our society is a continued account of efforts to find the best possibilities of fruit growing in Wisconsin. We have proved so much, and excited such hopes for profitable ventures in commercial orcharding in Wisconsin, that it is due to those whom we have encouraged, to see to it that they are wisely directed. In the meantime, we must not forget, that the interests of the farmer and small grower, are just as important as are the interests of those who have surplus capital seeking investment. Each head of a family represents a center of happiness to several individuals; a possible membership in our society, and a vote, and an influence, in making and directing legislators. In reviewing the activities of our society we realize that in the past, we have considered a great variety of subjects, in addition to caring for the various grades of demonstration orchards, which we have established. I can now think of but one class of horticulturists whom we have neglected. That is the commercial florist. Why should we not have them with us, as well as the nurserymen? With the many and diversified horticultural interests now being promoted by our society, it is easily possible that some may be temporarily overlooked.

We have accustomed ourselves to depend on the versatility of our secretary, feeling confident that his varied talents will always serve us. Are we not at times negligent in showing, with helpful suggestions, our interest in his work? A surplus of kindly thoughts would be better than apparent indifference on our part. These promptings apply to the support of our paper, as well as to the general affairs of the society. Could we not catalog and classify the various subjects and interests, that should be considered by our society, that a balance may always be maintained? In fruit culture, we have the large and small fruits to be cared for by commercial and amateur growers; market gardening and the care of the home garden; flowers for indoors and out; shrubs in various classes; evergreens and other trees; landscape art, parks, cemeteries and drives; school ground decoration and school children's gardens; the promotion of local horticultural and civic improvement societies. The foregoing is but a partially suggestive list

of the many subjects that we have considered in the past, and which will come before us again in the future. Might not these subjects and interests be classified by subdivisions, in such a way that we might look to the various members of our executive board, to keep in mind and have a sort of supervision of the sections assigned them? As it is, we know that we can look to our Lake Geneva brethren for certain classes of information. We know just whom to look to for light on legal questions and to whom to turn for nomenclature wisdom. Do we estimate as we should the value of the good will, and good fellowship gained through intercourse at our society gatherings? Many of us do I am sure, but we are missing one good, enjoyable feature, in failing to maintain our annual banquets. Perhaps they have been suspended—I hope not abandoned—because it has been difficult to work up a sustaining interest in each event, but I suspect that our loss is largely due to the fact that we have overloaded our secretary with too many cares at annual meeting time. Why not have it established, that the vice president of the society each year, shall be chairman of the banquet committee? Or when we have systematized our work and assigned special duties to each member of the executive committee, let us, by all means, make a good selection for a director of social functions.

Now that we have considered some of the qualities, which stand for the make-up of a good horticulturist, someone may ask, of what avail is it to study the rules of the game and live up to the standard of conduct, which shall entitle one to feel that he is a horticulturist in good standing? Why do so much for others? Surely he will value the good will of his fellows, and to him will be the contentment that is always the reward for unselfish service. Honors will come to him in time, but honors are not continuously satisfying. The crowning earthly joy of a well spent life will be the consciousness that one has done his best, and that his life has been a benefit to his fellow men.

WEDNESDAY EVENING SESSION. (LADIES' EVENING).

The meeting was called to order at 8 p. m., Mrs. Marcia Howlett in the chair.

Wild Flowers of Wisconsin—Mrs. Marcia Howlett.

What Women Can Do to Keep Boys on the Farm—Mrs. L. H. Palmer, Baraboo.

Interior of Country Home—Mrs. Ward Davis, Oshkosh.

Country Life—Mrs. N. A. Rasmussen, Oshkosh.

Children's Garden—Miss Cora Astell, Baraboo.

WILD FLOWERS OF WISCONSIN.

By MARCIA H. HOWLETT.

The woman who wishes to engage in horticulture has a high precedent for so doing, for in that first and fairest of gardens, God placed both man and woman to keep and to dress it. We, as horticulturists, claim a more ancient lineage than kings, queens or titled nobility.

The woman who engages in horticulture not only secures an abundance of fruit, flowers and vegetables to add to her material comfort, but at the same time, she also adds to her health and joyousness; for doctors' bills are decreased and the blues are put to flight.

No woman engages in horticulture for very long, without a hobby; and my hobby is wild flowers. In horticulture, as in all else, united cooperation can accomplish much more than isolated individual effort.

The task of preserving our native wild flowers, that in the pioneer days of our fathers swayed and nodded by the wayside and in the openings, or lit up the somber depths of the forest with glowing bloom, is well worthy of our united effort. The march of progress tends to trample and destroy our wild flowers, and in many places they are rare or entirely extinct. We have yet in a few favored localities in Wisconsin on shady hillside or in bosky dingle, beauty spots where from the time

the melting snows unfold the first anemone 'til the last Michaelmas Daisy is blighted by the frost, Nature's garden rivals man's most studied effort. Nature undisturbed gives the wild flower

"To rich and poor alike with lavish hand,
Though some souls never understand,
Or take them at God's value, but pass by,
The offered wealth, with dull, unseeing eye."

I ask all horticulturists to make a special effort to preserve our wild flowers, to study their habits, and help to keep them in all their delicate beauty and sweet loveliness for our childrens' children. Think not that your effort in this work will be lost, though necessarily feeble from the press of other duties. Neglect not to use your influence by word, deed, or thought, for who can measure their power?

"I shot an arrow into the air:
It fell to earth, I knew not where;
For so swiftly it flew, the sight
Could not follow it in its flight.

I breathed a song into the air:
It fell to earth, I knew not where
For, who has sight so keen and strong,
That it can follow the flight of song.

Long, long afterwards in an oak,
I found the arrow, still unbroke.
And the song, from beginning to end,
I found again—in the heart of a friend."

WHAT WOMEN CAN DO TO KEEP BOYS ON THE FARM

MRS. L. H. PALMER, BARABOO, WIS.

I sometimes think we don't half realize how large a part the boy plays in the lives of the most of us, or how dull and commonplace the country would be without his jolly, fun loving mischievous presence. The country is certainly the best place for him as it is little less than a calamity for a healthy boy to

be obliged to confine his activities, or work off his surplus energies, within the narrow confines of a city.

The subject of how to keep the boy on the farm is being much discussed, but no one can do more to solve that problem than his mother. It is said that a child's education should begin with his grandparents. Certain it is that it should begin very early in life.

Take him to help you make garden that he may early become interested in growing plants. Show him the seed germ as it starts, and encourage him to watch for it to push its way up through the soil. Call attention to the beauties of the unfolding leaves and watch with him the growth and development from the tiny shoot to the fully matured plant. Show him the relation the blossom bears as it opens and closes to the fruit, and get him interested in hunting for the varied forms of plant life in the home surroundings. Explain the necessity for thorough cultivation and the eradication of all weeds that the plants may receive the full benefit of the fertility of the soil. Point out the beauty of a well cultivated garden over one that has been neglected. It will help him when he has passed out to the larger realm of farm work, to understand why father insists that the fields be properly cultivated, and having learned the reason will not feel that, "Father is an old crank, just wants to keep a fellow at work." Give the boy a reason for what you expect him to do, and as a rule you will have no difficulty.

Help him to understand that though he is small, there is much he can do to help, and from the first exact instant and unquestioning obedience from him. Don't allow yourself to be coaxed or bullied into giving up to his whims. A boy soon loses all respect for a mother he can coax into granting his wishes against her better judgment, and with unutterable contempt in his voice will explain to his chum, "Oh she is easy. I can coax her over in a minute." Be honest with him in all things, fulfilling all promises to the letter. We have no more relentless critics than our children and a boy can receive no greater injury than to have his mother fail to measure up to what he has a right to expect of her. "Thou shalt not bear false witness," means infinitely more to a boy worked out in the family life than hung as a motto over the door. Teach him to be interested in and gentle with all live things. Show him

the difference between a butterfly and moth, and help him observe the changes in animal and vegetable life as the season advances. Help him to watch for the first birds and flowers of spring and tell him something of each. Make your home beautiful with trees and flowers that he may early learn to love the beautiful and form high ideals. Study his characteristics and guide him in his work. If he brings a bug or other insect to show you, don't give a shriek of terror and tell him to take the horrid thing away, but examine it with him, point out the beauty of its coloring, or the peculiarity of its formation and should he bring a pebble or some curious form of plant life, be interested with him, fix up a shelf in his room, if you can't afford a cabinet, that he may have a place for his treasures. Don't throw them away as trash. They mean much to your boy.

His room should be his to use as his needs require, and if shared with another, each should be taught to respect the rights of the other. In many homes there is a great difference in the furnishings of the boys' and girls' rooms. That is not just to either. Encourage the sister to make pretty and convenient things for her brother's room and also to keep it in order, and note with what pride he will call his chum's attention to the "gimcrack" that sis made or "see the handy contraption that mother gave me "for my birthday." Help both to understand how much they may be to each other in many ways. A sister is the best of modifiers for a boy, and a brother is the best anchor (except father) a girl can cling to.

Give your boy the best education you can, not with the idea that many do; that you want to fit him so he can make a living easier than drudging on the farm. That mistaken fallacy is fast vanishing into thin air, thanks to greater knowledge of business conditions. There is no class of men today, that needs to be educated along so many lines as does the farmer. Supplement his schooling with readings from the wide-open book of nature, as the broader and more complete his education, the greater will be his success as a farmer and a man. Keep in touch with his school, be a friend to his teacher, inviting her to your home that she may feel that you are interested in her and the work she is doing. Many times she is little more than a child and will be glad of your sympathy and help.

There is a general move all along the line to have agriculture taught in all schools, which is a fine thing, but while we are teaching farming to the boys, if we would go a step farther and teach our daughters to be efficient, contented home makers on the farm, we would do much toward making our boys contented farmers. If I were asked to tell in one sentence how to keep the boys on the farm, my reply would be, "Keep the girls there." Just as long as mothers bemoan the hard life of a farmer's wife and educate their daughters to think they will be happier anywhere than on the farm, just so long will the majority of the boys seek some occupation in the city. Teach your boys to be courteous, self-respecting gentlemen and they will be in no way inferior to anyone whom they meet.

Take your boy to church and Sunday-school and be an active loyal worker yourself that he may early become interested and enlisted on the side of right and justice. A boy has an inherited right to a dog, gun and fishing tackle. Give them to him and the opportunity to frequently use them and when he brings home a bag of game or string of fish, rejoice with him. Get up a family fishing party occasionally, inviting a neighboring family to join. It will do you all good and make the boys happy.

Make a red letter day of each passing birthday and all holidays. Invite his friends and give them the best room in the house, yes, all the rooms. You don't entertain your friends in the barn or on the woodpile. Why should your boy? Furnish plenty of games such as children delight in and have a dish of apples, nuts or pop corn for them to munch. Mingle with and be one with them. Don't worry about your dignity, it won't get lost. It is time parents, teachers, and preachers ceased to perch themselves on a pedestal so high as to be out of the reach of the boy they are trying to guide. You must come down to your boy's capabilities for a time, if you wish to keep pace with him as he develops and according as you bind your boy to you, with loving sympathy and keep in touch with his mind and heart, so will you be able to guide and control him when he most needs you. If your boy has not perfect trust and confidence in your love and judgment, at the age of ten or twelve years, you will not be able to in-

fluence him at the most critical time in his life, the adolescence period.

The boy should be kept busy with a judicious mixture of work and play. I would like to emphasize, let the work come first. Idleness is the mother of nearly all the discontent and mischief of boyhood. He should understand that he must work, as regularly as his father, that he is a part of the firm and that he is not only working for his father, but for himself also. The farm business should be an open book to him, that he may know as much as his father, the value of the stock and products of the farm, also what it costs to conduct the business. He will then be able to see the necessity for reasonable economy and be better satisfied if he knows what the proceeds from the farm are used for.

He should be encouraged to purchase some good stock for himself and care for it along with the other farm animals. Take special notice of it occasionally. Note improvements, if any, but don't be afraid to criticise if there be need. You must be brave and strong enough to help your boy see his faults and insist on betterment.

When the stock is sold, advise him about investing the money to the best advantage,—thus teaching him business methods and increasing his property interests and responsibilities at the same time. In short, give the boy a square deal all around. It may seem to many that these points were better left to the father, but in most cases the father is so busy supplying the needs of the family and farm, that he leaves the family affairs to the mother, believing that in all things pertaining to the home that "It is woman's hand that rocks the world."

While busy making a good farmer of your boy, don't neglect the social side of life. Fill your home with flowers, music and laughter. Keep up your personal appearance. In the hurry and stress of work, you are apt to grow careless in dress. You may not always be able to have elegant clothing, but you can always be carefully and tastefully dressed with hair becomingly arranged. When you go out with your boy, be especially careful in dressing, making the most of any beauty you may possess. He may not tell you, you look fine, but the quick glad look he will give you is worth working for. A boy is more sensitive than he appears to be and should

never have cause to blush for his mother's personal appearance.

Get him interested in organizing the neighbors into a social and culture club in which both old and young can take part. Hold regular meetings and have programs that will be instructive and entertaining. The head of the house may not be very enthusiastic about going out evenings, but he will go to please you if you present the subject in the right manner. Go with your boy to lectures and concerts. Give him the benefit of the best that comes your way. Patronize the public library, if there be one, if not get a movement started to provide one in some way. Furnish games of all kinds and a good supply of the best reading, magazines that discuss all up-to-date subjects, good stories of travel and adventure written by men and women who are alive with good red blood in their veins and know something of what they are writing. Have parties. Work, read, sing and dance with your boy. Don't be shocked, careful mother, but invite in such young people as you wish your boy to associate with and let them dance or play as they wish. They may take a little polish off the floor, better that than having him out in the streets looking for a place where he can have a good time, and he will find it too. He will be a much better boy, dancing with a few select friends in his home, than he will be with heart and brain hot with rebellion because you have denied him the privilege.

You may not lay up a large bank account, but you are doing something far better. You are working to build up and complete the best finished product of the age, a broadminded, well-educated, honorable farmer.

All this may sound rather strenuous, but when God gave us the privilege of motherhood, it was the greatest honor he could bestow. We should put forth every effort to live up to its requirements. In a few years, when your boys have gone out to farms of their own and some other boy comes to help with the work, be good to him, give him a pleasant home and you will not only have kept your boys on the farm, but you will do much to solve the problem of farm help.

INTERIORS OF FARM HOMES.

CLARA DAVIS.

This paper on farm homes assumes the fact that the gardener and his gardener-wife have made the outdoor surroundings of the home as attractive as possible, using flowers, shrubs, smooth lawn, trees, and always hard work, to bring about that condition.

And now as to the inside of farm homes. New houses that are being built in the country are about as convenient and attractive as those in the city, and many of the old farmhouses are having modern ideas introduced.

One of these ideas is that a house cut up into a great many small rooms is less desirable than one with fewer, but larger rooms; thus has come about the elimination of the parlor, a room whose stiffly arranged furniture and general "company" air never made it a very homelike or attractive place. Many new houses are being built with just one large living room and in some of the older houses doors between the old parlor and the living room are being cut wider, making the two rooms practically one. The question of heating may be raised. In case of a furnace there is no difference and if a stove is used one base burner will keep the two rooms warm and at a more even temperature than one small room, thus avoiding a great many of the colds that come with the winter season.

In regard to the furnishings—the walls of rooms that open into each other, like the parlor and living room we have been speaking of, should be finished in the same color, or in tones that harmonize. Browns and soft dull greens are always good. Rugs and carpets also, should harmonize in color with the walls. Pictures there should be, but not too many. They can be bought so cheaply now that people are tempted to crowd their walls with a lot of prints, water colors, and cheap oil paintings. Two or three well-selected pictures are enough for a moderate sized room.

The same is true in the matter of furniture. "Enough and no more" is a good rule to follow. If there is some chair, footstool or bric-a-brac that is not much used or has no espe-

cial interest, it is better out of the way, for unoccupied space looks better than that taken up by useless articles of furniture. A large reading table is such a companionable place for the family to gather round, and adds much to the comfort and appearance of a room. Comfortable chairs and bookshelves should be near. When choosing pieces of furniture it is well to have those in each room, of the same kind and finish of wood. The busy housekeeper will see to it that there are not many spindles and carved places to catch and hold the dust.

It is to be hoped that there is a downstairs bedroom in the farmhouse. In case of sickness this saves a great deal of work and if there are old people in the home it is asking a good deal to have them climb up and downstairs to a sleeping room.

There is not much to say about the dining-room except that it should be a cheery, well-lighted room. Growing plants in the windows add much to its attractiveness.

The kitchen is the place where the man has the chance to show his appreciation of his wife. This is where she spends the greatest share of her time and if this room is well-fitted and conveniently arranged it means a great saving of her time and labor. Painted or oilcloth covered walls are most easily kept clean. In case there is no pantry the china cupboards should be near the dining-room door. Kitchen cabinets are some of the new things that are being brought into modern homes and they are great helps in saving those many steps taken in traveling back and forth. The sink should be placed near the range to save carrying of water. It should be neither too high nor too low if a woman's back is to be considered. Thirty-four inches is the average height. A good drain leading from the sink is something that every country housewife will appreciate every day of her life. Nowadays after the first cost of installing has been considered, the farmer can have water piped through his house at less cost than his city neighbor. Using a double action force pump, the water is carried from the cistern to a tank in the garret. Being raised to this height gives pressure enough to supply water for kitchen and bathroom.

Leaving the kitchen, the bedrooms might be considered. Try to please the owners of the different rooms by having

the walls done in their favorite colors. Stenciling is popular and pretty too and not nearly so hard to do as it may seem. Curtains and covers for dressers and beds may be made at the expense of a little time and care. If artists' tube paints are used one has the satisfaction of knowing that the stenciled articles will not fade but come out of the wash looking better than they went into it for the washing seems to work the paint into the fabric.

Those who have old rag carpets laid aside can with joy take them out again for rag carpets are in style these days, especially for sleeping rooms. Because it lightens the task of cleaning, many people prefer to have bare floors, using rugs in place of carpets or matting. A strip of rag carpet with fringe at either end makes a good rug. Many women are having rugs woven to match the color scheme of the rooms in which they are to be used.

The floors in the upper rooms of most farmhouses are of pine. With a little work these may be changed to look like hardwood. First a coat of cream-colored paint (without gloss) should be given the floor, then the cracks filled with putty or crackfiller; next comes another coat of cream paint. When that is dry a coat of wood-shine or varnish of some kind will give the effect wanted and very good service also.

Everyone has photographs of friends or relatives that are good enough to serve as decorations of rooms but a photo is a personal thing and should not, as a usual rule, be displayed in a living room or parlor. One's own room is the best place for them. Small photos framed or passe partouted and hung in groups help to make a bedroom pretty.

And now from the top of the house let us descend to the bottom. A good cellar is almost a necessity in a farmhouse. A cement floor in the cellar is one of those things that add greatly to the comfort of life. If you haven't one, then here is a chance for the horticulturists to show that they are all-around men. For the asking most cement manufacturers will furnish booklets with all the information you need, a little money will furnish the needed materials, and work will do the rest and it can be done at a time when the outdoor work is not so pressing—even in winter, providing it does not freeze where you are working.

If there are a cistern and furnace in the cellar a good deal of space is already taken up by them and the bins for wood and coal. A room walled off for vegetables is a good thing to have. Another furnished with shelves for fruit jars will please the housekeeper and if there is no outdoor milkhouse, shelves and tables for milk pans are needed. If these rooms are given a few coats of whitewash their appearance will be much improved.

There are other parts of the house that might be spoken of but we will leave them. It is a fine thing to have a beautiful house, well furnished and conveniently arranged, but unless that house is a home, all these other things are of no value.

WHY I PREFER A COUNTRY LIFE.

ANNA L. RASMUSSEN.

After having lived about an equal number of years both in the city and in the country I have drawn conclusions and resolved that the remainder of my life shall be spent in the country. Not for one reason only, but for a great many, a few of which I shall mention.

I love the country which God made rather than the city which man made. Nature holds for me a charm which is almost lost to sight in the city. I shall not attempt to describe the beauties of Nature, as the poets and artists have taken care of that, but I think you will all agree that no poem nor painting, however beautiful, was half so inspiring as Nature herself. I shall read a little poem, which I think very fitting, entitled "Summer in the Country" by Louis E. Thayer.

SUMMER IN THE COUNTRY

Oh, summer in the country,
Everywhere a fellow sees
Things as glad and lively
As a swarm of new-fledged bees;
There are flowers in the pastures,
There are leaves upon each tree,
Oh, summer in the country—say,
That's the time for me.

Oh, summer in the country,
With its blue, clear summer skies,
With its beauties from days' dawn,
'Till the lingerin' sunshine dies;
Sometimes I think that man can catch
A glimpse of Paradise,
When the rays of cheerful sunshine
Come a siftin' to his eyes.

Oh, yes, I've tried the city,
But I could take no rest;
I longed so for the pillow,
That my head at home had pressed,
And my heart for me decided
That the country was the best.

Oh, summer in the country,
With the flowers and the birds,
With babblin' brooks and butterflies,
With bees and lovin' herds,
Oh, the feller may be happy,
Jes' as happy as can be
In the city, but the country,
Say—that's good enough for me.

There are a great many children in the cities who have actually never seen the sun rise nor set and have gotten only mere glimpses of a rainbow. In the country one may listen some fine spring evening to the concert of the birds and truthfully say it surpasses the band concerts of the cities. One is constantly in close touch with Nature, not only at every glance of the eye, but also at every turn of the hand and it is certainly more interesting and inspiring to work with Nature than with the most intricate machinery. Plant a few tiny seeds, watch them spring from the ground and quickly but steadily grow into beautiful flower crested plants or perchance into fine juicy fruit fit for a king's table.

And let me add right here that to anyone whose stomach is his best friend and who has a reasonably good digestive apparatus, the country affords fine opportunities. One is spared the expense and embarrassment of buying a dozen fresh eggs to find that half of them were fresh about six months ago; neither will you have trouble with sour milk for the country can give a good supply of clean sweet milk.

The vegetables, with which you are served, go almost directly from garden to kettle and are not dry, wilted and shopworn. The country housewife is also given the privilege of getting them from the field thereby taking a little needed out-of-door exercise and also creating an appetite for

dinner. And best of all are the berries. A great many city people fairly turn green with envy at sight of the bountiful dishes of berries and the pitchers of rich cream which adorn the tables of their country host's and they ask, "Why don't you bring such berries to town?" and the host smiles and answers, "Why?"

One advantage the country woman has over her city sisters is that she can, to a certain extent, choose her profession. Should she dislike certain duties about the house she can find plenty of pleasant employment out of doors and thereby earn more than enough to pay for hiring help in the house. Remember a man always receives greater compensation for his labor even though he may accomplish less than a woman. Who would not rather sit in a cool shady spot and prepare vegetables for market, or rather take care of a fine lot of chicks, than to fry a steak or bake bread on an average July day? Often my city sisters remark, "You are always so busy, why don't you do this way or that?" I really do not believe I am as busy as they are with their receptions, luncheons and afternoons at bridge, although perhaps I accomplish fully as much and I firmly believe in the old saying, "Let not the cost of your keep be wasted, be worth something."

Most country housewives can be somewhat independent. They need not necessarily depend on their husbands' salaries or dividends, but may have an income of their own. A small area may be devoted to the raising of some crops, which a woman can care for. She may have a profitable flower-bed or she may raise a fine flock of fowls, which will net her a neat sum. At any rate she will not be accused of going through man's pockets at night.

There again, the farmer's wife is a business woman. She is interested in a firm and should be able at all times to intelligently discuss business matters with her husband. If ever you had the idea that "any woman is fit for a farmer's wife," change that idea to this "a farmer's wife is fit for almost any other occupation." She should know the various trees, plants and flowers, the different breeds of animals and fowls; she should know how, when and where to plant all kinds of seeds, how to care for the plants and harvest the crops and in these days of scientific and progressive farming she is also expected to have some knowledge of book-keeping and stenog-

raphy. She must attain the ability of being an efficient saleslady and, besides this and a host of other knowledge, she must be a good housekeeper. Having mastered all these arts, she may some day aspire to assume the position of manager pro tem while her husband is in some distant part of the state attending the meetings of the State Horticultural Society. She will gladly be given the title, junior partner, but would, perhaps, by the stronger sex not so willingly be termed silent partner.

Then there comes one of the most important duties in life,—rearing of children. Children require fresh air, out-of-door exercise and plenty of room in which to play and opportunities to make themselves useful. All these are found in the country. Children are full of energy and are constantly looking for some way to use it. The country child has a dozen ways of carrying out his ambitions where the city child has perhaps only one. Country children may be given a little plot to care for and get proceeds derived therefrom or may be given pennies in compensation for their help or have a choice domestic animal all their very own—thus teaching them to help themselves and become good business men and women. The increasing effort now is to teach children that country life intelligently and skillfully directed offers health, independence and more of comfort and even luxury than most city people ever attain. Life is larger, freer and happier on the farm. Opportunities come to a child on the farm as often as to a child in the city. Statistics show that over 70 per cent of the really great men were born and brought up on the farm, including such men as Abraham Lincoln, Robert M. La Follette and President D. E. Bingham.

CHILDREN'S GARDENS IN BARABOO.

CORA ASTLE.

A widespread interest in the work of children's gardens is becoming more and more manifest. That the people as a whole gladly welcome some organized effort along this line is shown by the remarkable success of gardens under various conditions. The advantages of such work to the child and to

the community are many. However, it is the purpose of this paper, not to dwell upon that phase of the subject, but to tell briefly how plans for home gardens worked out in Baraboo, a city of between five and six thousand inhabitants.

In March of 1911 the women of the Twentieth Century Club decided to call a union meeting of all the club women of the city to see what united effort might be made along lines of civic improvement. The children's gardens of the past season were one of the results of that meeting. A sort of preliminary campaign relative to the gardens was carried on in the various clubs before the joint session, when a general sentiment strongly in favor of the movement was found to exist.

Gardens of different sorts were discussed, but we decided in favor of home gardens, as practically every family in Baraboo has a plot of ground available for cultivation. We realized too, that in a new undertaking, the children would need direction and encouragement which, under the circumstances, could best come from their parents.

In order to interest as many children as possible at the beginning and to keep them stimulated, we promised them a flower show at a date to be decided later and also a children's vegetable exhibit at the County Fair which is held in Baraboo late in September. At the Union Club meeting a committee was elected to arrange details and to get the work under way. To call the attention of the public to the project, the proceedings of this meeting were reported in both our daily papers.

The first work of the committee was to interest the teachers and to secure their assistance in presenting to the children such plans as should be formulated, and right here it might well be stated that the splendid enthusiasm and cooperation on the part of the teachers and parents made possible the success of the undertaking. In selecting the list of vegetables and flowers from which the children could choose the kinds they wanted to raise, we tried to avoid those having very fine seeds. Some additions to the original list were made at the request of the children, so that finally premiums were offered on the following vegetables and flowers: Tomatoes, cabbages, carrots, beets, onions, turnips, radishes, lettuce, parsley, sweet corn, pop corn, cucumbers, squashes, pumpkins, sunflowers, sweet peas, nasturtiums, verbenas, asters, phlox, painted daisies, snap-dragons, annual larkspurs, pansies, poppies, geraniums, and castor beans.

The children were required to raise everything from seed, excepting geraniums which were started from slips. In order that every child might have a considerable variety of vegetables and flowers, a local seed house was induced to put up penny packages for the children. However, there was no restrictions as to where seeds should be bought. We asked the children to keep account of the money spent for seeds and also of that received from the sale of vegetables and flowers. To encourage particularly these business methods, one of the women offered a special premium of bulbs on the accounts of gardens. There were other special premiums of bulbs, too, and we noticed that the children were far more pleased with them than they would have been with an equivalent sum of money. That might be an excellent means of encouraging boys and girls in the planting of fruits of various kinds, as well as ornamental shrubs and trees. We shall doubtless try it in Baraboo the coming season.

The contest was open to all children of school age residing in the city, however, high school pupils took but little interest. The younger pupils certainly went into gardening last spring with a great deal of vim, and, judging by results as shown at the exhibits, they kept at it through the summer.

When the time for the flower show arrived, the first Saturday after the opening of school, we decided that it might be safest to solicit flowers for decoration. People sent in great quantities of choice cuttings that added much to our display, but we found that the children alone would have made a very excellent exhibit. About sixty children brought bouquets, some as many as half a dozen each. We kept the small boys, who were on hand the first thing in the morning, busy fetching receptacles from the stores. It took much rapid work to get everything ready for the opening of the show in the afternoon, but finally the last bouquet was in place.

About two o'clock people began to come, and from that time on through the afternoon you could look up the street at any time and see a mother coming led by a small boy or girl. The children and the mothers were there in full force and a good many other people besides, both men and women. The show was held in the basement of the public library and the rooms were crowded all the afternoon. The evening attendance was also good. It certainly was very gratifying to hear express-

sions of surprise and appreciation on all sides, and expressions of sympathy and encouragement in the work were by no means rare.

The exhibits were arranged and judged according to wards, so, as Baraboo has three wards, there were three lots of premiums given. All premiums were divided 50, 30 and 20 cents. This arrangement prevailed at the vegetable exhibit at the fair also. Many of the flowers brought to the show would have done credit to older gardeners. It was interesting, too, to notice how beautifully some of the bouquets were arranged, while others showed careless handling. However, children are keen observers, and quick to take suggestions along lines interesting to them, so most of them at least will soon learn to prepare their exhibits skillfully.

After the flower show, the promise of a fine vegetable exhibit was so good that the officers of the agricultural society made a department for it and appointed a superintendent. They also secured a tent in which the exhibit was shown. Unless you have had experience with children in that sort of work, you cannot realize the interest the boys and girls took in their display. Some of them fairly lived at the tent when not in school. They were quick to see why perfection counted for more than size in the judging of their vegetables, and on the whole a spirit of fairness and generosity prevailed among them. As the Agricultural Society offered to give as much money in premiums for the children as the women should raise, we had been able to promise a very substantial prize for the best collective exhibit by the children of a single ward. This was divided 14, 12, and 10 dollars, the money going to the ward schools for the purpose of beautifying the buildings or grounds. Every child that had grown a vegetable or a geranium was on hand "to help the ward along," and after all was over it was really beautiful to see the satisfaction of the child who had received no premiums whatever, in the fact that she had helped to make the ward display.

Like the flower show, the vegetable exhibit received much favorable comment. By many it was conceded to be one of the most interesting features of the fair. The suggestion has even been made that the people of the city erect a building on the fair grounds for this special exhibit.

As to the financial part of the undertaking, expenses have

been met and premiums paid by receipts from the flower show and by voluntary contributions from individuals and societies.

The time should come soon when children may have expert instruction in gardening, and money so spent by a city will be returned many fold. Aside from the economic value, anyone having doubts as to the benefits of gardening for children should read Mrs. Burnett's new book "The Secret Garden." Of course not every child can have a secret garden or one so entrancingly beautiful as that portrayed by Mrs. Burnett, but each boy and girl may taste the joy of making things "come alive" while receiving the mental, moral and physical strength that comes from living in the pure air and working in the warm earth.

"Where you tend a rose, my lad,
A thistle cannot grow."

THE VEGETABLE FORCING INDUSTRY IN WISCONSIN.

FRANK OVENDEN.

Few people have the faintest idea of the extent of the vegetable forcing industry throughout the United States of America.

We are all more or less wrapped up in our own particular line of business and come to look on all others as of minor importance, even when they may be of a kindred nature and perhaps a sister branch of the same calling.

The forcing of vegetables is a branch of horticulture just as much as fruit growing, but, though closely related, are little known to each other. Each is an important branch of horticulture.

The forcing of vegetables requires the grower to carry on his calling near the city, which is his market. The larger the city the greater is the demand, and there is where we will find this industry thriving the most. In many of the smaller cities we will find the flower and vegetable business combined, but around cities like Milwaukee are many large establishments devoted to vegetables only. There are not nearly enough such establishments in Wisconsin to supply our de-

mand, a demand which is steadily growing and with a little stimulating will grow very rapidly.

A luxury at first, but soon a necessity, I am sorry to say that a very large part of Wisconsin's supply comes from other states. As this supply is obtained principally through Chicago and Milwaukee commission houses, it would be hard to tell from where we procured most of it. Reliable statistics are not to be had on the vegetable forcing alone and our Census Bureau gives the figures together with the florists, unless in the 1910 reports which are not yet published. I will tell you of a little journey I made last fall and what I saw, that may give you some idea of the extent of this business around our large cities, such as Chicago and also a probable source of supply for Wisconsin.

It became necessary for me to visit Evanston and the North West suburbs of Chicago last fall, so one fine morning found me standing on Ridge avenue, Evanston. From Ridge avenue west, is a large level stretch of country. This country is devoted, as far as you can see each way, to market gardening and truck farming, but what struck me most were the greenhouses in the foreground. The land is here laid out in city blocks and it seemed that every block was more or less covered with greenhouses.

Being a florist, and this my first visit in Evanston, I supposed these were all florists too, so I started out to inspect them, and you may imagine my surprise when I found that, with an occasional exception, they were all devoted to the vegetable forcing business. Many of these ranges were quite large, containing from fifteen to eighteen houses, each house 21 to 29 feet wide and from 100 to 200 feet in length. They were all up-to-date houses and were kept in good repair, which shows they were run by up-to-date prosperous business men. The homes of the owners of these ranges were also up-to-date and many were real fine homes. Many of these ranges were devoted entirely to lettuce, while others were devoted to various crops of vegetables. From Evanston I journeyed south along Ridge avenue as far as Rose Hill cemetery, a distance of six or seven miles, and it was more or less the same, but as I neared the cemetery the florist began to predominate and on the south side of the cemetery I found two of the largest ranges of glass in the United States, Peter and

George Reinberg's. They cover many city blocks and Peter Reinberg's contains 2,000,000 feet of glass. These are devoted entirely to roses.

I will not follow my journey any farther, as it was all amongst the florists, but what I have told you of Chicago is also true of Milwaukee in a much less degree.

From this is readily seen to what an enormous extent this business has grown around our large cities as Chicago, New York, Boston, etc. As I said before, the supply is far below the demand for winter vegetables in Wisconsin, and it seems to me that there is a good opening for many of our young and progressive horticulturists in this state to try their hands at forcing vegetables.

I am told that in the East many of the small fruit growers have forcing houses to occupy their time in the winter and with great success. The forcing business begins in September and is mostly over with by May, with the exception of tomatoes, cucumbers and melons, which are grown as an early summer crop as well as in winter.

Lettuce is the principal crop forced under glass and probably two-thirds of the forcing houses are devoted to this crop alone. This will yield from three to five crops in one season from September to May.

Radish stands next in importance and, as it grows and matures in from three to four weeks, is often sown between much slower growing crops. Tomatoes, cucumbers and melons are important crops, but require a much warmer temperature and are more particular in their requirements. They are often used to fill the houses during the summer when none of the cooler crops can be grown. Beets, beans, spinach, onions, cauliflower, parsley, cress, and many other vegetables are also forced under glass. Asparagus and pieplant (rhubarb) are two easily raised and good paying crops. These are raised under the benches as are also mushrooms.

The mushroom is more difficult to raise and those who are successful, make good money. There are some who make the raising of mushrooms a special business, having cellars, pits or houses constructed particularly for this business.

THURSDAY FORENOON SESSION.

PROPAGATING NURSERY STOCK.

WITH DEMONSTRATION.

PROF. J. G. MOORE.

To attempt to cover the subject of propagating nursery stock in the space of a short talk is impossible. We will therefore find ourselves confined on account of lack of time to a discussion of the more important phases of this subject.

The apple is by far the most important fruit in Wisconsin today and we will therefore consider first its propagation. There are two methods of propagating apples,—by budding and by grafting. Both of these operations come under the general head of graftage, which, in propagation we know as a means of propagating plants on the roots of other plants. The essential principles underlying the propagation of plants by these two methods are the same; the difference lying only in the matter of details in the operation.

In graftage we have the insertion of a sion upon a stock. By the term "stock" we mean that portion which is to provide the root-producing area of the new plant, and by the term "sion" we refer to the portion which is to produce the fruit bearing and food elaborating area of the new individual.

In budding, the sion consists of a single bud and the stock of a seedling which has been grown in the nursery row usually for one year. This seedling is commonly produced from seeds collected from apple pomace or the residue in making cider. In seedlings produced from this kind of seed we know very little of what the character of the seedling which we are to use will be as the varieties will be mixed, some coming possibly from tender sorts, others from those which are hardy and still others from those which are inferior and which will not make good stocks for the propagation of plants.

Nevertheless, nurserymen in this country have not found it profitable up to the present time to select the seed to any

extent by other means. In France and in some few instances in this country the seed for producing stock is from selected varieties. This is much to be preferred although the cost will be somewhat increased.

In grafting the sion is a short twig of the past season's growth, containing anywhere from 3 to 8 or 10 buds, depending on the length of the sion used and the variety to be propagated. The stock as in budding, is a seedling, but in the case of graftage instead of the stocks remaining in the nursery row and the operation being practiced there, they are dug in the fall and stored in the packing cellar or other convenient place until the proper season for making grafts.

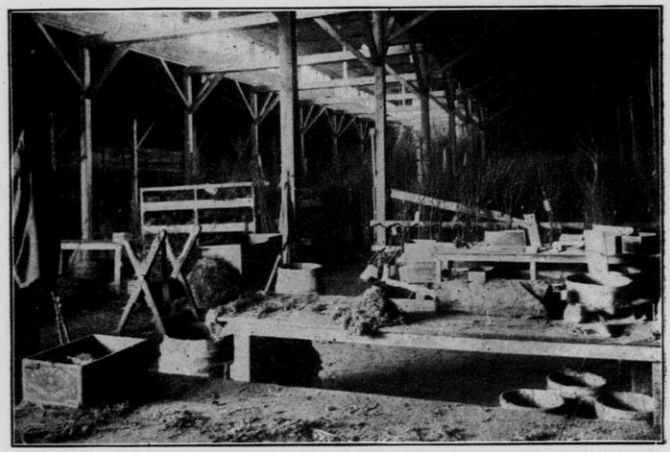
Budding is the method most commonly used in the eastern and southern states. The operation is performed in the north and in the eastern states in August using the buds of the present season's production. The method of inserting the bud is usually what is known as shield or "T" budding. It consists in making near the surface of the ground and on the side of the seedling protected from the sun, a horizontal cut, somewhere between ¼ to ½ inch in extent. Below this a vertical cut is made about one inch to 1¼ inches in length running up to the horizontal cut, making a "T" shaped incision from which the name of this method of budding is taken. From the bud stick which is a small twig of the present season's growth there is taken a bud making the cut from the bud toward the top of the branch. The stem of the leaf makes a very convenient little handle for handling this bud. It is then inserted between the edges of the vertical incision and pushed down so that the top of the piece of bark taken with the bud comes below the horizontal incision. The bud is then ready for wrapping. This may be done with raffia or some other material which will not injure the tree. Care should be taken not to cover the bud, but so wrap it that there will be as little evaporation as possible from the wound. The wrapping should be left on for two or three weeks, or until there has been a union of the bud with the stock. If the wrapping is left too long it will cause girdling of the stock which is undesirable. The bud should make no growth during the fall following its insertion, the only object being that it unite with the stock at this time. The following spring growth should begin, and when it has reached a few inches

in length the top of the stock should be removed so as to insure better growth of the new part. Care should be exercised in budding to use only first class buds from trees of known standard; prevent them drying out during the operation, and to see that wrappings are removed promptly when a union has taken place. It may be desirable to protect the buds during the winter. This may be done by mounding over the buds with soil.

Root grafting is by far the most common means of propagating apples in Wisconsin and other states of like climatic condition. As already indicated it consists of inserting a sion into a seedling stock, but in this case instead of inserting it upon the stem of the plant the sion is inserted on the root which gives the term "root grafting." One seedling root may furnish the root developing area for two or more new individuals which will be known as piece root graftage or the entire root may be used for new individuals, when it will be known as a whole root graft. There is some controversy as to the method of whole or piece root grafting, but at the present time by far the larger number of trees are propagated by the former method.

The piece of root which is used in piece root grafting is usually about three inches in extent. It is almost impossible to describe the method of making the cut for this graft sufficiently clear so that readers will understand the various operations. We shall attempt, however, to state them as clearly as possible. Cutting off the stock just below the crown which is the place of union of root and stem, selecting a straight side, and make a slanting cut about one to 1¼ inches in length. This cut will usually leave the end of the stock with an oblique surface, but it does not necessarily need to go clear through the stock. Beginning back upon this oblique surface about or in the center of the root, make an incision running nearly parallel to the side of the root, but inclined somewhat to the lower side as it is held in the hand. This cut should be about ¾ inches in length. It is desirable to have these cuts rather long for they give a much better surface for the union of the root and sion. It is easier to make the cut shorter, but the uniting area will be lessened. In making these cuts, they should be made smooth as wavy cuts make poor grafts.

Nursery packing shed and storage cellars.



View of interior of packing shed.

It will take some practice to become proficient in making these cuts but anyone can soon become more or less expert in the operation. The piece of root is then cut off at the desired length. The cut on the sion is made exactly like that on the stock. If the operation has been well done when the tongue of the sion is inserted into the stock the surface of the cuts will come so close together when slightly pressed, that there will be no light showing between the cut when held between the the operator and the window. If the cuts have not been well made then there will be areas in which the stock and sion do not come together, which of course is undesirable. In inserting the sion into the stock care should be taken to have one edge of the sion flush with one edge of the root. It does not matter if the other edge of the roots projects beyond the sion as this can be trimmed off prior to wrapping without any injury. After the insertion of the sion on the stock, wrapping is necessary in order to hold them together until callousing has taken place, and a natural union has been made. This may be done by using either grafting string or grafting cloth.

The method of preparing these materials is by making ordinary grafting wax and soaking a ball of common twine in the melted wax, or by dipping pieces of old muslin into the wax. In removing the cloth from the wax, draw between two pieces of lath or other smooth sticks which will remove the superflous wax from the cloth. It may then be hung up. It will become hard in a very short time and be ready for use. In using it is torn into strips about ¼ inches wide and the desired length. In wrapping the graft, care should be taken to keep the edges in apposition and to wrap firmly so that they will be held in position. The graft is then stored; usually placed in sand or sawdust or some material which may be kept sufficiently moist so that the sion will not dry out, but not wet enough to cause moulding. They are then placed in a room or cellar with the temperature sufficiently low that premature growth will not take place. Six or eight weeks should be sufficient under normal conditions for the callousing of the grafts.

The question of the length of sion which is to be left is very frequently one which is troublesome to the propagator. In root grafting farther south and east the sions are left

about three to 3½ inches in length. In Wisconsin and similar states, it is desirable to leave the sion much longer than this, usually about five to six inches. The object in leaving the long sion is that in planting the grafts they are set deeper leaving only about one inch of the sion projecting above the surface. In this way the sion is induced to root so that sooner or later we have a tree on its own roots which is very desirable in this section. With the short sions it is impossible to do this, the tree always remaining on the roots of the seedling.

Grafts are planted in the spring after danger from late frost is past. Where a large number are to be planted, a furrow may be plowed and grafts set along the land-side. Where only a few are to be set the spade is probably the best tool to use. Insert the spade into the soil to a depth sufficient to allow the insertion of the grafts to the desired distance. The grafts may then be set at either end of the incision. Removing the spade may make another incision about two inches from the first and directly at the side. Then by using the handle as a lever, press the soil firmly against the grafts. Two men usually work in setting grafts by this method, and the one who is handling the grafts should step on the opposite side of the grafts as the man operating the spade pushes the soil against them. This insures the grafts being placed firmly in the soil which is desirable in order that rooting may take place, and evaporation be reduced to the lowest possible amount.

CULTIVATION AND CARE OF THE TREE FRUIT NURSERY.

MR. R. J. COE, FORT ATKINSON.

Mr. Coe: Prof. Moore has grafted our sion on the root and the next question is to know what to do with it after he had it grafted, and I think perhaps the better way would be to begin a little bit back and take the preparation of the soil first, the kind of soil and the condition it should be in. Land that will produce a splendid crop of corn is in pretty good condition to grow apple trees and preferably soil that

has grown a crop of clover two years previously. The clover roots loosen up the soil and put it in the best possible condition for plant and tree growth. How shall we plant our grafts? This is a question of considerable importance to us as nurserymen. We have tried several methods and we have finally gotten down to the spade method, using a man and a boy, the boy to put in the root grafts, the man to use the spade. Use a heavy spade for this, throw the spade pretty well down into the soil, and the width of the spade is just about the right distance apart to put the graft, putting a graft in each corner of the opening, then crowding the ground up hard against the graft. This puts it in firmly and we think that is as good a way as we have ever tried.

A Member: How deep do you get your union in the soil?

Mr. Coe: We use about a seven-inch sion and we put it down so that when it is first planted, the top is just about level with the top of the ground. We have found this, that after it seems to be about level with the top of the ground and we have begun to cultivate, the ground will settle an inch or two and we like to have one bud of the sion above the ground. This makes it probably about ten inches deep. We use, as Prof. Moore has stated, a short root with a long sion, believing that we get more roots from the sion than we would in any other manner. In fact, I have dug up one year old trees many times and found the original root dead, or nearly so, and nearly of not quite all the roots that had grown were from the sion. We begin cultivating just as soon as we finish planting. In tamping the soil around the grafts we do not like to leave it in that condition, because that leaves it in the best possible condition to lose the moisture and we want to hold the moisture, so we begin cultivating as soon as the planting is done, using a fine tooth cultivator, so as to make the surface fine and mellow. This leaves the surface in the best possible condition for plant growth. Throughout the summer, our practice has been to simply cultivate and keep the field perfectly clean from weeds. Keep the soil stirred after every rain so as to get the best possible condition for plant growth. The first summer we do very little, if any, pruning. In fact, we like to have them grow and we like to have as many leaves down at the bottom of the young tree as possible, because from the quantity of

leaves that we have on the plant we get the stockiness of the tree. If we get a good growth we start out the next season and cultivate; cultivate throughout the season as we did the first season and here in Wisconsin, with us anyhow, we have to grow our trees three years in order to get a first class tree, and I am speaking only of Wisconsin conditions. After the second season's growth we do our first real pruning. If any sprouts that we do not want come up from the ground those are pruned off, but in the spring of the second season we do our first real pruning and at this time it is our practice to cut off all the branches smooth and cut off the top, leaving the tree about thirty inches. We have then a straight whip about thirty inches high and if it has been well grown the two year's before, we have a pretty stocky tree. You will find the tree starts out small branches all the way down the tree, that is what the nurserymen sometimes term feathering out and here we like to let those branches grow for some little time. In the South, I understand they glove-prune entirely, that is, lop off the branches, but with us we like to let the leaves grow and we go over it two or three times during the summer, cutting off the lower ones first but always leaving a good mass of foliage so as to get a good, stocky tree. This applies only to apple trees. We have grown a few pear trees, but not with very good success; we have grown some plum trees, but we have never grown any cherry trees, because we have not had very good success in Wisconsin with cherry trees.

Mr. Palmer: Would not you advise cutting off the crown after the first year's growth?

Mr. Coe: We have tried it, we have had better success the other way.

Mr. Palmer: I notice Dudley does it the other way.

Mr. Coe: Yes, a good many do. I am telling about our practice, we have had a better growth by not cutting back. There is one point in regard to the blackcap raspberry that Prof. Moore brought out that I should like to impress upon your mind. You will notice he told you to plant black raspberries deep and he also said to fill the hole only partly full. I want to bring out that point. We plant them deep, but we only put a little soil on, just a little bit until this sprout has started to grow,

Block of 2 year currant bushes in nursery.

Block of three year apples in nursery.

A Member: You spoke about setting out grafts the width of a spade apart. How long do you let them remain so close together? Do you take them out after the growth starts?

Mr. Coe: No, talking about apple trees, they remain where they are planted.

A Member: I should think if they are so close together they could not form a good root system.

Mr. Coe: Six or eight inches is about the right distance. We let them grow where they are planted, they have plenty of room to grow.

A Member: It seems to me you would get a better form of tree if they were set two feet apart.

Mr. Coe: If the nurserymen set them two feet apart, and took all chances of losses that we have, there would not be any profit in the nursery business.

Mr. Bassett: This is a little out of the question, but I wish to place here on the table some Hood river apples, fancy Spitzenberg, packed by the Hood River Association. I gave thirty cents for them. I wish you would come up after the meeting is over and examine them.

THE STRAWBERRY AND BUSH FRUIT NURSERY.

Mr. M. S. Kellogg: I shall take very little time and trust to the discussion to bring out the points that are necessary in a topic of this kind. First, you must have good soil and you must have that soil well prepared when you plant out your propagating beds. In growing the strawberry there is such a diversity of opinion amongst commercial growers as to which is the better method of growing the plants, whether to use the hedgerow system, or matted row system, or double hedgerow, that that is simply a matter of personal taste really and will not be very seriously considered. In the majority of cases, however, I think the commercial grower of strawberry plants uses the matted row system in the propagation of strawberry plants. Our practice has been to plant our propagating beds with the rows running four feet the wide way and two feet between plants the cross way. A great many use cross cultivation during the early part of the summer until the new runners begin to root and in this

way save a large amount of expense in hoeing the young plantation and we think we get a better stand and better plants by this method than we could by the simple method of cultivating one way. Where you are growing a large number of varieties in the same block that do not all grow with equal rapidity you will be forced to stop the cross cultivation by the rooting of the layers on some of the most vigorous kinds before the slow growing kinds have shown any indication of throwing out runners or roots at all. This, however, we cannot get away from and the matter of cultivation is simply a matter of conserving the moisture that there is in the soil, keeping down the weeds and putting the plants in good healthy condition for winter quarters. The sooner your plants are covered after the season's growth terminates, the better for the health of the plants. As soon as the ground begins to freeze it is time to put on the covering. Some growers advocate a light covering in the early part of the winter and a heavier covering later. This we do not advocate; the entire covering which is needed for the bed is applied at one operation. In talking of the bush fruit nursery, in the propagation of raspberries, as has been demonstrated here by Prof. Moore, the black raspberries need a little more room in the propagating row than do the red varieties and if we sandwich the red varieties in a plantation beween blackcaps, you interfere with cross cultivation, but unless your plantations are of considerable size, it perhaps is a better plan to divide the varieties into different plantations, although some advantage is gained by reduction of expense in hoeing, also keeping the ground well stirred and conserving the moisture. The time of putting down the tips of blackcaps is one of vital importance in the conduct of a bush fruit nursery, because if conditions are at all adverse, a difference of six hours sometimes between the times when the tips are in proper condition for layering, getting them down promptly means the difference between success and failure. If there is a high wind and the young shoots are in proper condition for layering they often will be damaged enough in six hours' time so that they refuse to root. If they are injured by rubbing on the ground or on one another, it is rarely you get a successful tip. That is one of the things the nurseryman has to watch. The point is to get the

tips down in the pink of condition so that you will be sure to get good roots during the coming season. Red raspberries in propagation practically take care of themselves. Suckers come up sufficiently thick and sometimes even so thick that the nurseryman is afraid to cultivate, but this is a mistaken idea and the cultivator must be kept running continually if you have the right kind of stock. Currants, gooseberries, blackberries and other bush fruits are cared for largely in the same way as raspberries. Black raspberries are propagated in a great many instances largely by rooting cutting plants in place of the sucker plants. In many nurseries they are propagated by both methods. Currants are grown in this latitude by the hardwood cutting method and the time for planting these cuttings is largely a matter of personal opinion and convenience, considering labor and other conditions, some putting them in in the fall and others in the spring. The one thing that must be kept in mind throughout the whole of the nursery work is clean cultivation and lots of it to conserve moisture and keep down the weeds.

Mr. Stevens: I should like to ask Mr. Kellogg if in starting a young apple orchard there would be any damage done to the growing trees by planting strawberries the first two or three years between the rows of apple trees and giving them thorough cultivation?

Mr. Kellogg: If your ground is in good condition, I do not think it would be any particular damage to the orchard to grow small fruits in that orchard for a short term of years, providing you do not crowd your trees. Give the trees plenty of room. The trees are what you have the ground devoted to permanently and the small fruit is simply a filler until the trees demand the ground.

A Member: Has Mr. Kellogg had any success in rooting the gooseberry from hardwood cuttings?

Mr. Kellogg: The gooseberry does not root as readily from hardwood cuttings as does the currant and other bush fruits. Under conditions that are right, they do root fairly well from cuttings, but there are probably more gooseberries throughout the country propagated by the layering method than any other method, unless you have a greenhouse in which to start your cuttings with both top and bottom heat, where you can

induce the callousing before putting them out in the nursery row.

A Member: In layering gooseberries, is it not better to bank right up to the layers?

Mr. Kellogg: That would simply be a matter of local conditions and convenience. In some soils we could probably do better work in layering by the banking method, while in other soils, we would put part of the bush or the entire bush down and have fully as good or better results that way. It depends largely on the condition of the ground and what the soil is and a great deal on the man behind the bush.

The President: In regard to planting strawberries in the young orchard, there is a point that has not been fully answered and that might leave a wrong impression. I should like to hear something more on that.

Mr. Coe: As I understand the gentleman's question it is whether it would be advisable to plant strawberries in the young orchard. I should say most decidedly no, and I give you my reason for it. The year that you plant your strawberries of course you do no harm, but we believe in the cultivation of the orchard, and the next year, the year that you get your fruit, you cannot cultivate your orchard until after the berries are harvested and the old plants taken out. This will take you beyond the period when the orchard should be cultivated. You have all the season's growth and all the weather conditions to contend with and all the drought and all the lack of cultivation while you are growing your crop of berries. You should not think of planting strawberries in the orchard.

Mr. Kellogg: I emphasize the fact that you should give your trees plenty of room. If you do not plant your strawberries closer to the row of apple trees than eight or ten feet, eight feet at least from the row of trees, then plant your first row of berries, I think you would get plenty of room for cultivation even in the season of fruiting of the berries. You would not suffer for lack of cultivation to the extent that a great many would think. Planting the ground entirely to strawberries would be a grave mistake.

Prof. Moore: I think Mr. Kellogg has covered that point in saying that in any kind of cropping of a young orchard no matter whether strawberries or anything else, you have got

to give your trees room enough. If you are going to crop your orchard to cultivated crops, which are the only crops that are permissible we must at the same time provide for returning plant food to the soil.

The President: There is one more point, and that is this: The gentleman asking this question I suppose wanted to know whether it will be practical as well as profitable. Then when you consider the point that you are taking eight feet from the trees, at the distance, orchard trees have to be apart, in order to make it profitable to plant strawberries under those conditions, it would hardly be a practical idea to plant one row only of strawberries. Where your trees are twenty feet apart, you would only get in two rows of strawberries.

Mr. Kellogg: If you have an orchard with trees twenty feet apart, do not set anything but apple trees. If you have your trees thirty feet apart, you will have room for three rows of strawberries and you would get a good, profitable crop of strawberries.

Mr. Richardson: If we were going to plant apple trees and not crop between, I am afraid we would have to go to the poorhouse, because the taxes would eat us up; the land is too valuable, if we only take one crop off. We would like to get four or five crops each season between our apple trees. In the short time the strawberry crop is taken off,—we plant in the same row—as soon as taken off we mulch around the apple trees. It kind of checks the growth so that we do not get too much wood. I do not see any objection.

A Member: What is the best cover for strawberries?

Mr. Kellogg: The ideal covering is wild hay. Where you cannot get that, any grass literally free from weed seed that is heavy enough to remain is a good cover. The idea is to keep the ground frozen. It is not the extreme cold that kills, it is the freezing and thawing that kills them. It pulls them up. The beds that are used strictly for propagation we rake off so that we can take the plants free from any interference by the cover. Wild hay is absolutely without weed seed. Straw, no matter how well threshed, has more or less grain in it that is bound to sprout and cause more or less trouble next year.

TOP WORKING TREES IN THE NURSERY.

E. A. SMITH, LAKE CITY, MINN.

PLANTING THE SEEDS.

We plant the apple seeds and at the end of one year dig the roots, then sort them and transplant those suitable in the spring of the following year. These we grow one year, at the close of which there will be a top varying in length from one to three feet, and in caliper from ¼ to ⅜ of an inch. The seedling root now has a two years growth and a one year top. The following spring we cut off this top somewhat close to the ground, then select a sion of such variety as we wish to propagate about the same size as the apple seedling. The root is cut slanting and the sion about the same slant so that they will fit somewhat closely, using the whip grafting method. We then wind soft grafting wax about the root and sion at the point of union so as to hold the sion firmly in place.

PREPARING THE GRAFTING WAX.

The wax is prepared in the following manner: 1 lb. beeswax, 1 lb. tallow, 6 lbs. resin. Put in a kettle, melt and thoroughly mix. Then take out in chunks about as large as a man's fist and cool. The wax can then be laid aside for an indefinite period. When it is used for grafting it must be heated. We have a small stove especially prepared for this purpose in the field. We set a pail of water on it to be heated, and put the grafting wax in this water to be softened. A man then puts grease upon his hands so that he can handle the wax without its sticking. We prefer wax to either waxed paper or cloth as it yields more readily to the growth of the tree, expanding and yet always fitting the growth so closely as to be air-tight, thus insuring a perfect union.

Soon after the wax is wound about the sion and root, it becomes cool and the wax is then very firm and becomes quite hard so that it will not readily dent with the finger nail, but in the warm rays of the sun the wax quickly softens and becomes smooth on the outside, almost as though it had been

polished. This helps in the shedding of rainfall so that the water which runs down the sion, as soon as it strikes the wax quickly runs over the surface and away from the point of grafting. The work must be done in the spring as early as possible.

RESULTS.

Where the union takes place an enlarged growth quite often occurs which is frequently so rough and large in appearance, it is sometimes mistaken for crown gall, but as the tree becomes older this enlargement disappears, the tree growth building up around it. The wax sticks tightly to the tree and frequently remains upon it either in a broken or crumbly condition for several years. In fact, we have seen traces of wax upon a tree five years after it was planted. It does no harm whatever to the tree, does not render it unsound, and is not put on the tree to cover a defect. Nurserymen unfamiliar with this method of propagation have been led to wonder what the wax is for, but the method is all right. To convince yourself of this fact you have only to try it. In southern countries it would not be a success for the reason that the extreme heat would melt the wax and it would run away from the point of union, but as far north as Minnesota there is very little danger of this occurring.

ADVANTAGES.

Now what is the advantage of using this method of grafting in the nursery field Under normal conditions a five to six or four to five foot tree, branched, can be grown in two years, while with the piece root system it often takes from three to four years to produce a good five to six foot tree.

COST.

The first cost is greater than in piece root grafting, but this is made up in the time saved in producing a tree ready for market. Two men with the assistance of a boy who handles the wax, can top-graft in the nursery, 1200 to 1400 trees in a day. Trees grown in this manner are healthy, vigorous, desirable and much sought after by those favoring the whole root method of propagation.

Budding with us has not proven a marked success, but this method of field top-grafting has. We grow about fifty thousand apple trees in this way each year and over one hundred and fifty thousand plum and Compass Cherry trees. We should grow more of our apple trees in the manner above described, but we do not have the time, men or facilities for doing the work properly in the comparatively short season when the work to be successful must be done.

Some varieties of trees do better using the whole root system than on the piece root or in budding, and as you know, some seasons the growth will be much better than other seasons, but as a whole, this method is a success and well worth a trial.

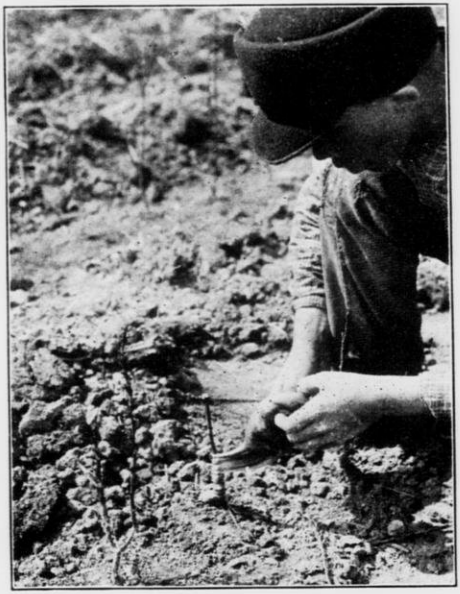
Mr. Kellogg: I should like to ask Mr. Smith, if, in the propagation of the apple, particularly under the crown grafting method, do you produce a tree that will stand the rigors of a northern climate alongside the piece root on a common sion as commercially grown?

Mr. Smith: We do.

Mr. Bassett: If they stand it so well, why do they try to get rid of them by selling them so young?

Mr. Smith: Every nurseryman knows the sooner he can get a tree into the market, the more money he saves in doing it. If we carry it over another year, we have the expense of the ground, expense of cultivation, there is bound to be a certain per cent of injury to nursery stock, no matter how it is propagated, you have to take the risk in all trees, some risk, but in the method of the piece root grafting, the loss would be no greater.

Crown Grafting—Cutting off the top.



Crown Grafting—Waxing the graft.

THURSDAY AFTERNOON SESSION.

RATIONAL CARE OF STREET AND SHADE TREES.

BY ALFRED SENN, CITY FORESTER OF THE CITY OF MILWAUKEE.

Within the last four years a general interest in shade trees has aroused public attention, especially in the East where this interest is well illustrated by the amount of money expended in this particular line of work. The welfare of shade trees, which can only be maintained by systematic management and care, has created a demand for the establishment of a Shade Tree Department in the City Forestry Department. Brooklyn and Buffalo allow an annual appropriation of $65,000, for the exclusive care of their shade trees, Newark, N. J., $37,000.

The aim of such departments is to add to the number of street trees by setting out new plantations, to conserve and care for those and the older street trees, to awaken, sustain and stimulate enlightened interest in street trees and by these means to enlarge life's wholesome pleasure, to enhance the city's beauty, to encourage its healthfulness and advance its realty interest.

First of all, the street trees as well as the park trees should be controlled by the municipality or government and placed under the jurisdiction of a single head, a tree warden. Large cities can afford to have their own municipal shade and street tree department but for smaller towns, as we have in this state, we should have state laws as they have in New Jersey, Pennsylvania and Massachusetts, leaving it free to each town and city to supplement the statute by local ordinances, and I would suggest that this society take the first step towards enactment of a state law encouraging the protection of street and highway trees throughout the State of Wisconsin.

There ought to be a State Shade Tree Commission, and a State Tree Warden, a man trained in the science of forestry and arborculture, whose duty it shall be to give instructions

in planting, spraying, pruning and cultivating and promote public interest through lectures and writings.

The ordinary work of a city forester, arborculturist or tree warden consists in planting trees, exterminating insects and disease, protecting the street tree from accidental or willful injuries by man, from injuries by public service corporations, from gnawing horses, house movers, street graders, etc., however, it seems to me there are problems just as worthy of the attention of well trained foresters. There is the woodlot idea —a chance to establish a forest close to a city, town or village and to lay the principles of conservative forestry right at the threshold of every citizen. When we talk parks, we usually understand by this a display of elaborate buildings, ornamental cut stone and floral designs,—the ornamental but useless park. People overlook or don't think of having parks in their natural condition within city limits where they can find peace and restfulness.

Forests are the most beautiful ornaments of a landscape. A forest is the en masse of trees; remove the trees and you have nothing left, however, besides trees we have other inmates in the forest, such as grass, shrubs, flowers, ferns, animals, especially birds. Remove the trees and the rest of their natural building and you deprive the inmates of their homes. Strenuous efforts have been made to save wild birds from extermination, but the most radical remedy to accomplish that, is to restore and protect their secluded breeding places.

I was born and raised in Switzerland. My home, a small village of 600 families, has large municipal forests. Each family gets enough wood to last the whole year through, besides this the country is selling much wood annually and the taxes to be levied are small indeed. However, it must be understood that the city forests are not only to serve the financial purpose, on the contrary, they also serve the esthetical purpose, for the axe in the hands of a skillful forester with sense for the beautiful, is the same as the paint brush in the hands of an artist. Whether we establish and develop a formal or natural park, it will be a monument that will stand forth from generation to generation—a monument not carved out of a lifeless mass, but a monument of life that will continually add to its value of beauty if judicially managed.

A pleasure woodlot differs from a formal park both in object and method of treatment. The latter is characterized by its artistic elements, the former by its natural elements. In the forest or woodlot, Nature is to lead, yet if given the let alone policy, she will commit esthetic errors, and assistance with axe and spade have to follow her; in the formal, the art of the landscape architect must be positive.

The public often improperly criticises interference with Nature while on the other hand the park manager is assisting Nature too much. The mistake is often made that the conditions affecting trees in the woods are transferred to those on the lawn. A tree growing in the open differs widely from a tree of the same species growing in the forest. There the tree appeals to us by its individual form or symmetry for its individual development is not interfered with by its neighbors. But in the forest, where the trees are crowded, it is not the single tree we admire but the ensemble—the finest type.

The question now arises, in what shape or manner may a state have jurisdiction over woodlots and highway trees? In this connection I wish to refer to bulletin 125 of the Massachusetts Agricultural Experiment Station.

"In our country towns one of the most difficult questions arises from the cutting of woodlots having frontage on a public highway. Often it is desirable that a fringe of trees or at least a row of selected shade trees be preserved, while the lot owner, in too many cases, wishes to cut them and often does make a clean sweep to the roadway in defiance of the law. After the cutting is done, the only remedy is by prosecution or an action at law. If the warden knows what is going on, he can prohibit the cutting of any trees within the highway lines and should enforce his prohibition.

In either case his first step must be to determine the location of the highway line and this is the most difficult case. It is most important that every town in Massachusetts should have its public highways surveyed and their lines determined.

State highways form an exception to the jurisdiction of the tree warden as heretofore stated. The exclusive care and control of all trees, shrubs and growths within the limits of state highways, is given to the State Highway Commission, which has authority over all planting, trimming, cutting or removal on such highways. The provision in regard to defacement, in-

jury or disfigurement are to be enforced by the tree warden. However, should he fail to act in the case of a State Highway Commission within thirty days after the receipt of a complaint in writing from the Massachusetts Highway Commission, the commission may proceed through its own agents to enforce these provisions also."

Be it in the city or country it is useless to properly care for trees if they are not under municipal or governmental control, and in order to obtain the most impressive effect, the execution of highway planting must be in the hands of a special department created for that purpose, thus only the choice and proper species, the use of one variety on one street, the uniform and proper spacing and the protection and cultivation of the trees can be satisfactorily carried out.

My subject calls for rational care of street and shade trees. At first glance it would seem that I should give the different steps of operation in the care of street and shade trees. In view of the fact, however, that the members of the State Horticultural Society present here are engaged in tree culture I fear I could give you only such hints and suggestions as you already know. I therefore thought I would not make a direct address to you on the subject, but an indirect address through you to those not at this gathering, the citizens of the State of Wisconsin.

Mr. Senn: I think it would be a timely subject for this society to consider whether or not we should have a law concerning shade and street trees, and if this society feels that such a thing should be done, then I would recommend that the chairman appoint a committee which would frame a law within a year and when we meet again in a year from now, this law could be brought before this meeting and then turned over to the legislature which should be in session at the time. I move that the president appoint a committee to take the matter up and frame a law which would be suitable for the state of Wisconsin and submit it to us in a year from now.

Motion seconded and carried.

SEEDS AND SEED SELECTION.

DR. W. W. TRACY, BUREAU OF HORTICULTURE, U. S. DEPARTMENT OF AGRICULTURE.

The basic purpose of all cultivation of the soil is control of the character of the vegetative growth rather than a mere increase of its volume. At a cost of labor which it is hard for us to fully appreciate, our fathers cleared away the forests and broke up the prairies that the vitalizing energy of sun and soil might be directed to the production of the particular kinds of plants and in just the proportions they thought would be most useful. It is doubtful if there are more individual plants or those of better development growing within ten miles of Madison to-day than there were one hundred years ago, but there has been a gain and our orchards and fields make possible for us an incomparably broader, fuller—yes better life, than was possible for our parents on the prairies and amid the forests of the last century.

In the case of your orchards and vineyards you direct the productive energy of sun and soil to the growth, not only of fruit but to the particular variety of fruit, which you think would be most satisfactory. With perennial plants like those of the apple and strawberry, we secure uniformity as to the character of the crop by multiplying the vegetative parts of some plant of proven desirable character, and thus secure a large culture of what is in reality but a single plant which we distinguish by a varietal name that always stands for any vegetative part of that particular seedling, and so for a definite and unchanging varietal character. To accomplish this uniformity of product of a desired type we do not hesitate to expend a considerable amount of labor to multiply by grafting, by cutting, by runners and in other ways the vegetative parts of that desirable plant, and to set them by themselves in orchard or plantation. A ten acre orchard of healthy and productive apple trees, each bearing fruit of different form and color, though all good market quality, would not be very valuable. The fruit of a strawberry plantation which was a mixture of plants of one hundred or even

of twenty of the very best sorts, but of different size, shape, color and time of ripening would hardly be worth gathering.

It is true that the volume and character of the market product of such so-called different plants of the same sort may vary because of differing climatic and soil conditions. A Grimes Golden apple grown on your farm may be very different from one grown by your neighbor, or your strawberries ripen earlier and be sweeter than his, though his bed was set from yours, but such differences are most likely to be because of differing soils and cultural conditions. Were we to interchange conditons we would interchange the character of the fruit but you would not claim that such differences showed that varietal character of an apple tree or strawberry plant was of no importance.

In the case of grains and what are generally classed as farm crops which are propagated by seed, while there may be varietal differences which adapt sorts to different conditions of soil and climate or call for slightly different cultural methods in order to secure the best results, yet with possibly a few exceptions, such differences are not of such a character or so marked that a mixture of sorts in the same culture affects the cost of growing and harvesting or the value of the market product.

With garden vegetables, however, variations as to habit of growth, time of maturity, appearance and quality of market product, are much greater than in grains or even in many fruits and have a much greater affect upon the market values. In some cases different varieties of the same species require for their best development double the space, and do not reach edible maturity nearly as quickly as others and very generally a superior lot will bring double, triple or even five times the price of inferior offerings of the same varieties. Seed of the Champion of England and American Wonder peas are so near alike that even an expert cannot be certain as to which variety many individual peas in a mixed lot of seed really are, yet the two sorts differ so much in habit of growth and time of maturity that if mixed and planted together there will be practically a total loss of one or the other. As most vegetables are annuals at least as far as crop is concerned it is not generally practical to make plantations of vegetative parts of a single plant, the varietal character

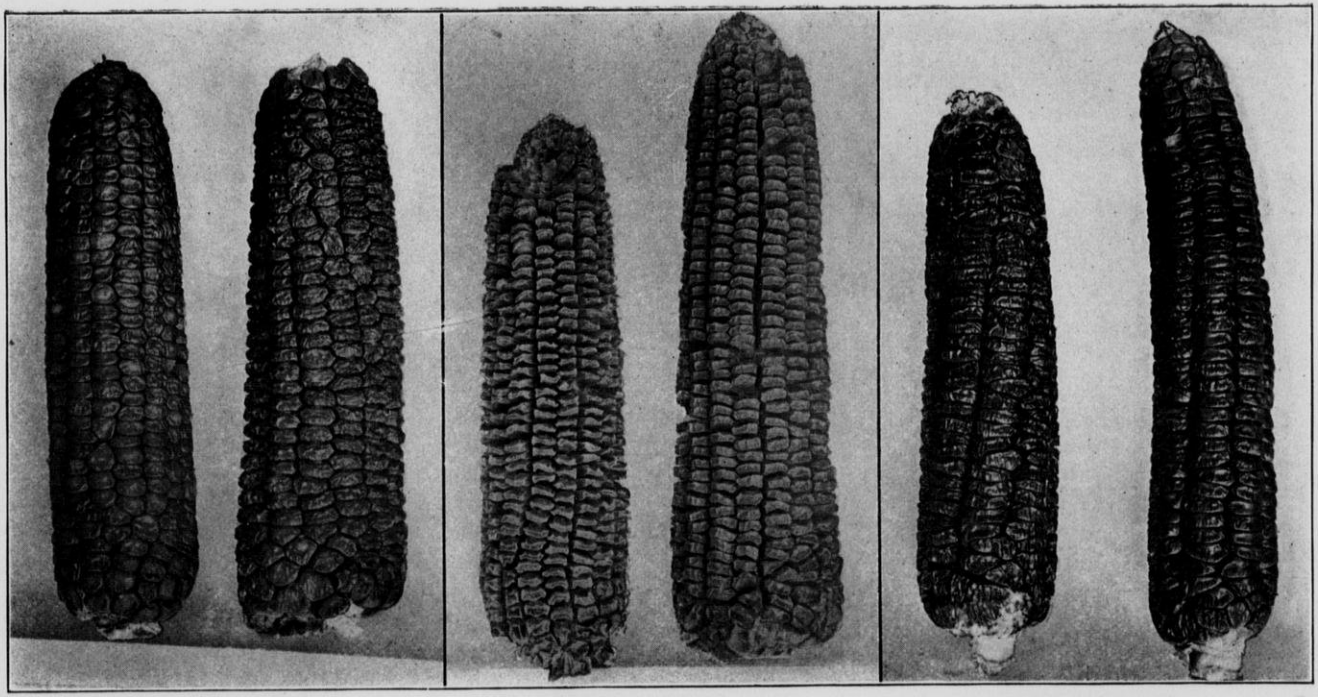
of whose market product under the same cultural conditions is unchangeable. Any crop of vegetables is the product of innumerable individuals, each distinct, and the problem of uniformity of product is not as in fruits one of multiplying vegetative parts of an individual of predetermined character but of multiplying individuals which shall be as like as possible in the character of their market product. In one case a varietal name stands for a certain immutable combination of the same varietal tendencies as developed in a single plant. In the other it stands for a mutable conception of a combination of different varietal tendencies as developed in innumerable plants; each the product of an individual seed which is simply a minute plant packed for transportation.

We will leave to wiser heads the discussion of the basic cause of plant variation; why no two plants or even no two leaves on the same plant are precisely alike, and will consider the fact as an element in our problem of how to secure seed which will develop into plants of any desired varietal character. First, the varietal character of every plant with all its limitations and potentialities of development was unalterably fixed in the seed from which it grew before that seed left the parent plant, carrying within itself a balanced sum of varient tendencies inherited in different relative strength from each of its ancestors of an unknown number of generations. We can predict the varietal character of the plant any seed will develop into only in proportion to the correctness of our knowledge of what their varient tendencies are and the shrewdness of our guess as to their relative strength. We have to depend upon a mere guess, for even the most perfect knowledge of the general working of Mendelia laws does not enable us to predict with certainty the exact proportionate strength of different inheritances and the resultant character of each seed, for every seed has an individual character and potentiality of development which may not be the same as other seeds from the same plant or even from the same fruit. I once had a very exceptionally fine plant of a certain variety of tomato; I rooted cuttings of this plant until I had enough for nearly an acre which was located where there was little probability of any of the flowers being fertilized from other flowers. Although the fruit product was comparatively small it was the most uniform lot

I ever saw, each fruit like every other. I saved a lot of seed, supposing it would be of exceptional value. I was disappointed, for cultures grown from this lot of seed showed much greater variation than those from ordinary stocks of seed of the variety. Why? Because my original plant was nearly perfect on account of a very fortunate combination of the proportionate influences inherited from each of many ancestors, while the seeds of that perfect plant though made up of the same inherited influences but in different proportionate strengths gave me varying results. Although by no means a perfect illustration, a suggestive one of the way the character of two plants made up of the same inherited tendencies but in different proportionate strength may vary, can be drawn from the digits—654 which in their relative positions always stand for six hundred and fifty-four—a number which cannot be expressed by the same digits in any other order or if we take away or add a single digit even if it be a one.

Variation in all plants is so often the result of conditions of soil and climate and so largely a matter of degree that it is easy for one to find instances where numbers seem to substantiate any claim of variation that may be made, but I will give an illustration from experience showing how the relative importance of the characteristics like the value of the digit does not lessen its importance in determining the value of the sum.

Some fifteen years ago there was developed a strain of a certain variety of watermelon in which an invisible but very desirable quality was correlated with one which was easily seen and shipments of this stock commanded extra prices because of quality. A block of about one-half acre was planted with this stock and about three-fourths of all of the fruits produced showed the peculiarity. Seed from the most perfect fruits of about forty of the plants in which this was best developed were saved separately and numbered in the order of the degree they showed the variations, although it was so well developed in all of these selected fruits that when the numbered melons were mixed those who had made the selection and given the numbers were unable to replace the fruits in the same order as before. The seed from each melon was saved separately and correspondingly numbered



No. 1. No. 2.
Crosby.
No. 1. As originally sent out by Josiah Crosby.
No. 2. As grown in 1911.

Stowell's Evergreen.
Ideal selections made by two brothers.

Golden Bantam.
Two ears as grown by two seed growers living within five miles of each other, Dec. 27, 1911.

and about one-fourth of each lot of seed was planted and labeled with the number given the fruit. The general uniformity of the crop of melons was noticeable, and most of the lots showed more or less of the desired peculiarity but in only three of the lots, those numbered 3, 7 and 11, was it well developed in *every* fruit. All the other lots contained more or less fruits in which it was absent or imperfectly developed; and strange to say the lots from the fruits which had been marked number one and number five in order of merit in our previous year's selection contained the greatest number of fruits in which the desired quality was lacking.

The next season the balance of the seed from the fruit which had been marked number 11, was planted where there was little liability of the blossoms being crossed from other melons and a critical selection made of the fruits which not only had this peculiarity well developed, but which were as uniform as possible as to other desirable qualities, and their seed product saved for stock. The next year this seed was used to plant a 40-acre field, and when this was in full fruit, a bright, observant young man and I spent over two hours hunting in vain through it for a single fruit in which the peculiarity upon which our original selection was largely based was not well developed. It is but fair to say, however, that when the time came to gather and seed the fruit, twenty of them were rejected because they did not show this variation. Further experience with this stock shows the necessity of continued selection. Some nine years later I visited three large fields which were planted with seed which was only the fifth generation from that nearly perfect stock, and in not more than half of the fruits was the desired variation noticeable. The growers had thought that the seed from the original field was so perfect that it needed no attention and it had gone the way of all neglected things.

The characteristic upon the more or less perfect development of which the selection was made was of itself of absolutely no value, but it was very generally correlated with invisible qualities of the greatest value. Very often one has to rely upon such correlations in making his selections. This calls for fullest acquaintance with varietal differences and their correlations. Thus the shape of the leaves of a strap-

leaved turnip or the shade of color in squash which might or might not be of importance of themselves may through correlation be the visible indication of invisible qualities which do most materially affect value. In the case of the watermelon referred to, the visible character was a peculiar yellow color where the melon rested on the ground. I learned of its importance from an old darkey living in the region where the variety originated, who told me that if I wanted a real sweet melon I must get a "Yellow belly" and the variety was generally known where it originated as the "Yellow belly." Yellow skin, however, does not always stand for quality. In some other sorts a white skin indicates the best stock. In a sort which at one time was a very popular shipping melon, the peculiar character of the blossom end depression was an indication of shipping quality, and its loss of the sort in favor as a shipper has kept pace with the disappearance of this character in the stocks offered by seedsmen. The value of varietal description is largely based on such sort of correlation of qualities,—a correlation which is rarely in accordance with any known general law and can only be learned by careful study of visible varietal differences and what they indicate. We think there is no branch of horticulture which offers such an open, and as yet, comparatively unworked field for profitable study as this. And it is an unworked field. I recently spent several days among growers of seed sweet corn in Connecticut and it was astonishing to see the want of uniformity as to the conception of what was the most desirable form for even our oldest and most widely grown varieties. I have here some sample ears of sweet corn which illustrate this.

Photograph 1. Two ears of Stowell's Evergreen as selected by two brothers of the same seed growing firm without consultation as to their ideals of the sort.

Photograph 2. 1. An ear of Crosby Corn as near as possible like one selected in 1887 by Josiah Crosby the originator, as representing his ideal of the variety. 2. An ear selected in 1911 by one of the best growers as the present ideal of the sort.

Photograph 3. Two ears of Bantam as selected for stock seed by two of our best growers living within five miles of each other.

The fact that such differences in the character of the seed corn do not of themselves affect the value of the market product does not lessen their importance, for one at all familiar with vegetative forms will recognize the possibility that they are correlated with invisible characteristics which do not materially affect market value. Nor are such differences in varietal forms of stocks offered under the same name peculiar to sweet corn, they are to be found in nearly all stocks of our common garden vegetables. With such differences as to the ideals of the sort existing among the seed growers who supply our dealers with stocks of the same variety, which are liable to say the least to be mixed together before they are offered to the public—is it surprising that the planter should find that his crops are so lacking in uniformity of varietal character as to increase the cost of growing and marketing and lessen profit?

Let us turn now from this general discussion of present conditions to that of how we may grow better strains of seed than those in general use. First, I want to refer to a condition not very generally recognized, and still less understood, and that is the adjustment of plants to local conditions, which adjustment in some genera at least is carried in the seed. The Office of Horticultural Investigations of the Department of Agriculture have carried on some experiments which make this seem evident. Starting with a certain strain of two varieties of Sweet Corn—there were grown for five generations in different locations, each year the seed grown in all locations was selected to a common type and the local grown seed planted in comparison with seed of the same original stock and varietal selection grown elsewhere, and in nearly every case in what was practically thirty different tests, the local grown seed gave larger and better yields. Trials made by others gave similar results with plants of certain genera. In our experience, however, plants of other genera, notably the Curcurbitaceae do not transmit such local adjustment through the seed. Enough has been proven, however, to show the general superiority of seed grown under the same environment as that of the crop desired. How then can we secure seed of the most uniform possible varietal character and which is adapted to our own conditions?

The first step in the securing of such a stock is to form a very clear and definite conception of the exact varietal form we desire. I think is is essential that this be written out and be frequently referred to in order to avoid the indefiniteness and change in the type selected, which I think is the cause of much of the variability now so common. It is a practical impossibility to write out a description which will enable the reader to recognize with certainty the exact type of plant the writer had in mind, but I also know by experience that the attempt to write such a description will always sharpen the writer's conception of the exact form he is after and be of great assistance to him in holding to that exact model from year to year, as it is essential that he should do in order to establish a strain of seed which will be of the exact character desired.

The second step is to select a score or more plants each of which come as near the exact ideal of the sort as possible, avoiding the temptation to include even superlative plants that differ in any way from the ideal of the variety. We should save the seed of each plant separately even where two or more of them are so near alike as to be indistinguishable.

The third step is to make growing tests of samples of each of these lots of seed, planting a liberal quantity of each under uniform conditions of soil and culture. As the plants develop they should be carefully studied and the lot in which each and every plant is the most like our ideal of the sort should be selected, resisting the temptation to take a lot which may contain superlative plants of the sort but also some which are inferior or which, though superior, are of a different varietal type from that aimed at.

In order to guard against the possibility of a hidden variant in our select plant and the many mishaps to which the seed grown is always liable, it is well to select one or more plants, as substitutes for our first selection. It is rarely worth while to save any seed of this trial planting, even that of our selected plants, at least not as a basis for stock seed.

The fourth step is to plant the reserved seed of the plant, which our trial has proved to be the best, and also when practical, some of the substitute plants where they will not be liable to cross-fertilization from other plants of the species. If

our first selection was as good as our trial indicated and we have in it a plant of the exact type desired, which did not carry a hidden tendency to variation inherited from some earlier generation, the battle is won, for all we need to do is to multiply the descendants of this pure plant without them being contaminated through pollen from some plant of a different varietal character.

Human control of conditions is imperfect. Man must still eat his bread in the sweat of his face and it is quite possible that, in spite of our failure to discover it in our trial, our foundation plant did carry a hidden variant which may crop out in some future generation so as to spoil our uniformity, in which case all we can do is to try one of the substitutes, or commence over again. Again it is generally impossible to avoid more or less crossing in succeeding generations so that sooner or later, we are likely to lose any pure strain we may have obtained, but in the case of most vegetables, we can secure several crops before this occurs and, in the meantime, we should have built up as good or a better strain to take its place.

I do not want it to be inferred from what I have said that I am in any way antagonistic to seedsmen for I am not, and believe that they are quite as well informed as to the real wants of their customers and fully as desirous of supplying just what they want and are as willing to pay for as any class of merchants, but they do and will continue to get their stocks where those which will best satisfy their customers as to quality and price can be secured at least cost, and will strive to furnish better and more uniform stocks as fast as their customers demand and are willing to pay for them. What I have tried to show is the importance of the use of seed of more uniformity as to varietal character than that which most growers are now satisfied with; that the great need and hope of betterment is not in wonderful "Burbankian creations" of fabulous productions and of hitherto unknown superlative quality, but in truer and better stocks of the sorts we now have.

DISCUSSION.

Mr. Toole: I suppose that each one of us who has listened to this valuable paper has been impressed with the importance of some particular point that has been brought out. I am im-

pressed with the importance of recognizing the value of the possibilities of the seeds of some particular plants. A few years ago I read before this society a paper on individual prepotency in plant breeding and each year in our pansy seed growing, I am more fully impressed with the value of that idea and if we are trying to improve one of the newer varieties we prepare them, several seeds from each plant separately that we are selecting from, if we have several that may be up to our standard, knowing that the result will be that some one plant for some reason that we do not know will have a larger proportion of what we aim for than will the progenitor of some other plant. My son has carried on experiments in corn breeding and that same result has been found, that for some reason that we do not know there are some plants that will give better results than others, that the progeny is more apt to be like the parent than are the results from some other plants, so it is of great value to you to carry out that when you are trying to improve any variety, or to keep up the standard of any variety. Because, if you save the seed of each plant separately and experiment with them, if you have found something that has a tendency to prepotency, you can take it up. If you save for a number of the best, and then try to get your best, your best plants are simply diluted with the others.

Mr. Tracy: May I speak of another illustration? When I was living in Grand Traverse county, I spent a half day writing out an examination of just what smut nose corn should be, that was the sort we had to grow. Then, after spending a half day, I went into a seven acre field close by and spent the whole afternoon trying to find ten plants which came up to my ideal, ten plants in which the stalk and leaf and the proportion of leaf to the stalk and the height of the stalk and the character of the ear were just right. Well, I had to quit, after spending the whole afternoon in that way I did not succeed in finding the ten plants that I desired that came up to my ideal, that scored as high as I thought they ought to. I could not find ten, I only had seven. I saved each of those plants separately and planted them by themselves and continued them for seven years, while I was at that place. The seventh year I exhibited at the State Horticultural Society, I took the same field and I tied sixteen stalks one to another and took it to the

County Fair, every stalk of those sixteen growing in consecutive order was as near to my ideal as the seven plants I had tried to pick out of that whole seven acres seven years before. I had secured that uniformity by simply that process, and I could give scores of such instances. I tell you, gentlemen, just as has been spoken of, there is a wonderful prepotency in certain plants to breed true and those are the ones which should be worked for and stuck to.

IMPROVE THE SMALL LOT.

WM. G. MCLEAN, PARK SUPT. MADISON.

This short paper is not prepared as a guide for horticulturists setting forth what or how to plant, but rather that it might encourage more of our small holders to improve their surroundings. Burbank says, "Environment is the architect of heredity." It is time we should appreciate this, and consider it a privilege to improve our environment.

The most neglected spots in every city are to be found on the small lots, and when we stop to consider what a small amount of work would do, and then begin to multiply the benefits, we naturally ask ourselves, why is this?

It often happens that professional people, of exceptional ability, fail to reach their desired goal, simply because they advocate methods, too advanced for understanding and appreciation of the masses.

This holds as true with the art of gardening as with other vocations and I find that in general, people don't want too much preaching. What is the use of going into exhaustive details, when usually a simple primary lesson of practical application, will be better understood and really must precede that which is of a higher grade. Every person who improves their grounds, by planting a shrub, tree or flower, is a public benefactor.

But why does the work of garden making languish? Is it because we do not fully realize the many benefits to be derived therefrom, or is it possible that we have been frightened out by some article, written at length, about planting effects,

where the writer speaks of the many detail considerations, with complex environments, etc., until we are confused as to the real purpose?

I do not want to belittle the artist, because he is the man to do the large things, and we all know, that to be a real landscape architect, requires ability, character and many years of preparation, but give unto Caesar, that which is Caesar's, and I am sure that it is not absolutely necessary to call on the services of an expert, to plant or maintain the average small lot, where the building usually occupies two-thirds of the grounds.

I am anxious to encourage this work by proving how simple it is, rather than by how complex. For example, the Chinese whom we consider as being uneducated, is nevertheless a good gardener, and then again there is the pleasure of learning and improving by experience. Many of our successful farmers have gained their experience right in the field, inside their own fence. A certain good gardener, in Chicago, who happens to be a good friend of mine once consented to teach a young lady the principles of cultivating plants. This lady was very anxious to learn—she had been studying at the University of Chicago—but she came to the conclusion that it would be a great help to receive some instructions from a man who actually made a living by raising plants. This lady was preparing to take care of a large country estate, and to this end she wished to qualify. Lessons were given twice a week, and included nearly everything, from preparing the soil and sowing the seed, to potting, transplanting, cultivating and pruning, but when spring arrived and he requested this young lady to come out into the garden and actually prepare a seedbed, he found that all of his lessons had been of little avail, in so far as their practical application was concerned,—so he began all over again—something like this; "This is a spade, it is a tool used to cultivate the ground, you grasp it by the handle with both hands—so fashion—set the blade upon the ground and with one foot you drive it in. Then by drawing the handle towards you, the soil is pried loose and it is easily turned over," etc., etc. All this simply proves how essential the practical lessons are. There are a few general rules to be observed, but it is safe to say, that nearly all are familiar with these, such as good soil, plenty of sunlight and

good cultivation. I might say that cultivation is neglected more than anything else and I would like to suggest that this work be done by the children, under the supervision of the parents. The children would be greatly benefited.

The next question is what to plant. There is no room upon the small lot for trees,—their place is out on the street,—because while half a dozen trees may grow well enough in your back yard while they are small, as they grow up it becomes necessary to trim off the side limbs, with the final result, that you have the effect of a yard full of crooked telephone poles.

Just plant a few native shrubs, up near the foundation of the house, and possibly a clump in the corner of your lot, or to hide some objectional view. Keep the lawn open as much as possible, that is, don't dot it all over with plants. If you would add flower beds, place them up against the shrub planting and see what a fine background the shrubs will make. These plants need not be expensive—what could be nicer than a few dogwood, elderberry or bittersweet, which abound in the woods in this locality? All that is needed is the willingness to do a little work. Do not plant for the sole purpose of hiding some old ash pile, but rather clear away the ash heap and plant a few grape vines in its place or any other worthy plant.

Possibly I should have mentioned the lawn first, because that which is most pleasing and refreshing about the home, is of most value, and this must be credited to a good lawn, well maintained. The following is a simple method of improving the lawn, that may be applied at any time of the year, when the ground is dry,—known as top dressing. This is a method that has been used successfully in Holland, for many years. From the bottom of the many ditches that convey the water to the pumps in Holland, they rake out the marl, which accumulates at the bottom, and allow this to lie upon the banks over winter. The following spring, this marl is of a better consistency to handle, and is then spread upon the lawn, about one inch in depth. Upon meadows, where cows are permitted to graze, for ten months of the year, this treatment is repeated every three years, and in this way good pastures are maintained for forty years or more, without re-seeding. I believe that most of our pastures run out in six or eight years.

It is a well known fact, that the frosts of winter lift the stools of grass each year, thereby weakening it by exposure. So this top dressing, not only benefits as a fertilizer, but by filling the concaves from one stool to another, it acts as a mulch, encouraging the grass to stool out stronger. If the lawn becomes weak or weedy, it needs a treatment of this kind. It is far better to choke out the weeds by a vigorous growth of grass and clover than to dig them out with a knife. You will find that just as soon as the lawn becomes weak, the weeds will get a start. We often see stable manure spread upon the lawn in winter as a means of feeding the lawn, but this is of little or no benefit because the spring rains wash the juices into the sewer, before the ground underneath has had a chance to thaw. It reminds me of giving a man a drink of whiskey when he doesn't need it.

A good top dressing for this purpose can be made by a body of prepared soil, composed of nine parts of top soil thoroughly mixed with one part of well rotted stable manure. This mixture spread over the lawn, and rubbed in with the back of a rake, will also produce a smoother surface than can be obtained in any other way. If your lawn is weedy, it will be well to sow a liberal sprinkle of white clover, before applying the top dressing. This will help to choke out the objectionable weeds, as well as to make a good foundation for the hard usage a lawn often receives.

The small lot with its usual up corners, is not an ideal place for the cultivation of vegetables and yet there are some varieties, such as lettuce, radish and green onions, that do well enough, but the larger varieties, such as tomatoes, cucumbers, melons, corn, cabbage and cauliflower, will need a more free and airy situation. I have mentioned vegetables, in connection with the small lot, because of the great returns realized, for the small amount of labor, properly applied,—and yet it is only good business principle, to recommend a cleaning-up first, in order to provide a fit place for the cultivation of any plant. It is well to remember that all vegetables do best when planted out in the open, free from the one-sided conditions of light and air, which are so harmful near buildings and fences. For this reason we shall endeavor to utilize all the vacant lots in the city for the purpose of raising vegetables. There are certain sections or districts in

every large city, where plant life will not exist, because of unhealthy conditions, such as too much gas, smoke and sour soil, but I hold this criterion, that where plant life will not exist, we should not establish a permanent home, nor attempt to raise our children under such adverse conditions.

It is not necessary to draw a hair line by saying that a certain plant must be planted here, or there. We all possess some individuality, and right here, in the planting effects, as well as in the architectural design of our house, is a chance for its expression. My hope lies in the child, and by improving the front and back of our lot, the child is benefited most.

To create higher real estate values, to relieve congestion, to improve sanitary conditions, and to teach the child some of the possibilities of nature, are a few of the benefits made possible by planting a very few shrubs or flowers and then directing the child in their maintenance.

PLANT DISEASE AND SANITATION.

PROF. L. R. JONES.

You ask me to tell you some of our conclusions as to what ought to be done to better control plant diseases. Not much can be said in the (15) minutes alloted me.

It must suffice therefore for me to emphasize the one most important thing. You probably expect me to say "more thorough spraying," but I am not going to do so. I do not minimize its importance, but you already understand this part better than the one I would emphasize which is "more attention to plant sanitation." You all know what is meant by sanitation in connection with human disease, it consists in keeping our bodies and our home surroundings clean and pure that they may be free from disease germs.

We are learning that it is easier and cheaper and more comfortable thus to keep our bodies healthy than it is to cure them after the disease germs have found lodgement, and we are gladly paying each year more for disinfectants and sanitation and less for internal medicines.

The same principles hold in the control of plant diseases. Our aim should be not to learn how to treat sick plants but

how to keep them healthy—how to keep disease germs away. When the germs or spores are abundant on some of the plants in the field or garden we must spray so as to keep them from passing from these to the healthy plants. This is right so far as it goes. But in too many cases we pay no attention to trying to keep the disease germs out of the field in the first place or to destroying the sick plants, which continue to harbor the disease and to breed the germs for further infection.

Were there time I would emphasize the importance of this in the control of some of the diseases for which we are commonly relying upon spraying alone, such as apple scab, brown rot of plums, potato blights, etc. Even for these the rule should be sanitation first, spraying second. But it is more important for me now to emphasize the fact that there are some other common diseases which cannot be controlled by spraying.

As examples I may cite crown gall and hairy root of fruit trees, recently shown to be a contagious bacterial disease; the wilt disease of cucumbers another bacterial disease; and certain parasitic diseases of pea, bean and cabbage, which are threatening to check the profitable culture of these important truck crops. Time will not permit us to discuss all of them in detail. I will therefore take the cabbage diseases as illustrative of the principles governing all. The cabbage thrives remarkably well on certain types of strong soils in Wisconsin especially when they are heavily manured. As a result it has proved a most remarkable crop. The growers, making more money out of that than from other crops, like to grow cabbage repeatedly on the same soil.

Unfortunately the cabbage is liable to four serious diseases; black rot, yellows, black-leg, and club root. None of these diseases are native in Wisconsin soil. Everyone of them are capable of persisting from year to year in the soil when introduced.

What has happened? All have appeared in Wisconsin cabbage fields in one or another place. The black rot has been widely scattered probably because it is carried on the seed. The yellows are becoming so prevalent in portions of the Racine—Kenosha district that cabbage can no longer be cultivated profitably, the other two diseases have been introduced in one or two places but are as yet local in their distribution.

None of these diseases can be controlled by spraying. The moral is or should be clear to every prospective cabbage grower who desires to develop this as a market crop. Cabbage seed should be disinfected by soaking it for 20 minutes in a solution of one ounce of formalin in eight quarts of water (1 to 250).

The crop should be rotated and if any diseased plants are seen, they should be removed and destroyed. If possible to turn sheep into the cabbage field in the autumn to eat up the refuse it is highly desirable. In other words strict attention should be given to sanitation; clean seed, clean soil with efforts to keep it clean, these are the things to be emphasized. Much the same points could be made with reference to the pea blight. The germs of the diseases, which are threatening the Wisconsin crop are perpetuated in the soil and carried over on seed and straw. Continuous culture on the same soil with inattention to source of seed are sure to bring trouble.

But instead of attempting further details I will, in closing, emphasize once more that for all of these communicable diseases of plants as of animals we should remember that sanitation is the thing of first and fundamental importance.

The President: We will have to continue the program and we will call on Miss Harper who has something to present to the convention.

Miss Blanche Harper: I have been a member of the Horticultural Society for several years. I am not interested in fruit at all and I have met a great many people who would join the Society, or have been members and then dropped out, because so little attention is paid to other topics. Commercial fruit and commercial fruit growing seem to monopolize most all the publications and almost monopolize the conventions entirely and leave those who are looking for help along the lines in which they are interested here in Wisconsin without aid. As I understand it, the Horticultural Society is founded for the benefit of the citizens of the state as a whole and not for the fruit growers alone, but yet there has very little been done for any of the other branches. The recent gradual changes which have come about in the conditions of

living in the past few years, the constant rise in prices, the cost and difficulty of getting what one needs, makes me feel that the society owes a duty to the citizens of the state, the poor man, the man who has only a little bit of ground, to come forward and show him how to use that ground, how to have a back yard and garden and make the most of it. I live in the suburbs, just outside the city, and all around me are working people, the men are teamsters or carpenters and they all have families, they are hardworking, plain people. Every one of those families has a garden and some of them get their entire vegetable supply for the year from that garden and some of them get only part of it. It is done largely by women. The men are gone a good part of the day, but they spade up the gardens in the spring and then they leave it for the women to finish. It is done pleasantly, it is done as if it were more of a recreation than a drudgery and yet it makes a very perceptible difference in their expenses. I have estimated from the gardens around me that they must save from two to three dollars a week, every one of those families, and some as much as five. I have a garden myself which is 60 by 60 feet and out of it I get all that I use the year around, except potatoes. I have enough to give away to my neighbors and in fact more than I need, and it has been my experience that has shown me the value in the domestic economy of the household of the back yard garden. Of course it is always easy for the society to go along the line of least resistance, fruit growing has a large following, the men are interested and this other work is going to be difficult to take up, because you have to interest a lot of people that are by education rather apathetic, they do not want to get out of their beaten track, they do not know which way to turn, but there is all the more need to help them. I did not think until very recently that I would say anything about this, or make any effort to stir up an interest in it, but when I did I went to one or two people who I thought would be interested in the matter and in fact saw the governor. I sent him a little protest that Mr. Cranefield published in the last number of the HORTICULTURIST, and I asked him what he thought of the idea, and in reply I had this letter: (Reads)

I do not ask that the society shall start out on a violent crusade in this matter. They would have to feel their way slowly and they could do it by publishing circulars, because the class of people that we are seeking to help are not going to read a government bulletin. I have tried loaning some of those people government bulletins and they do not read them. The only way you will get them to read anything is to give them something that is very short, very terse, not burdened with any kind of argument or scientific explanation. Give them absolute and somewhat dogmatic directions as to how to make a garden, have a series of circulars telling how to make a small garden only with as few square feet as possible, and then if they want something more, give them something for a little larger one. They will read anything less than four pages, and the solution then is to make the bulletins four pages. As to the distribution of these, it seems to me that if we were to send out through the factories, through the public libraries, even through the women's societies in churches, or through the Salvation Army, we might reach the people who need help in that way. You cannot mail those circulars to them and you cannot expect them to apply for them, but I think there is room there for an immense amount of work to be done if the society will only undertake it and then for the people who are better off, the people who have means and education and do read, there is very little done in the publications of the society to help them in flower gardening or vegetable gardening. I met several people in Milwaukee whom I asked to become members of this society and one man, a prominent banker said, "Why, I do not want to join that, I am interested in my back yard garden."

He has eighteen feet square and he spends his entire summer working there. I have asked other people the same thing, several members who dropped out recently, I said to them, "Why did you drop out?" "Well," they said, "They do not give us anything we want, it is all fruit. I am interested in gardening." The person who spoke has just built a big country place at Neshota, she was interested in landscape gardening and vegetable gardening, but she felt she got nothing, so she dropped out. I do not blame the fruit members and I do not blame the management, because they have

gone where the demand seemed the greatest, but now if there is a demand and a particular need in other directions, it does seem to me as if the funds given by the state for the development of horticulture in the state ought to be devoted to something that will be of assistance to everybody.

The President: You have heard this very ably presented protest, is there anything to be said on the subject?

Mr. Toole: I think we are all in accord with the spirit and intent and very clearly defined desire and plans for the betterment of a certain class and I am sure that we are all willing to boost them if they are willing to climb, but I do think we have no really definite idea as to how we can reach them. There is this one thing of preparing a bulletin for them, but it is in a line that most of us have not given very much thought to, and the best way will be to get somebody out to look over the field, get knowledge from the best of them and then fire it back to them. It comes to us as something of a duty in the way of missionary work, like so many other things. We find at this session that there are many other interests, even the greenhouse men and the commercial florist are thinking of forming an auxiliary society, realizing that this society has a great deal to do and it is possible an auxiliary society might take up the particular lines of interest. Our executive committee has to have the work plotted out and different ones assigned to the care of different interests. But there is this he must bear in mind, if any one will take hold of say half a dozen volumes of the reports of this society, it will be found that this society has done a great deal in the line presented, floriculture, lawns, parks, playgrounds, we really have done something besides giving attention to fruit culture. I feel myself like standing up somewhat in defense of the society, I think it is hardly fair to say that the fruit interests have overshadowed everything else. At the same time we all need to watch closely and see that all interests are represented.

Mr. Ovenden: I belong to a branch of horticulture that is not very well represented in this society and I have been a member of this society for about fourteen years. I am interested in all branches of horticulture as well and hope some day to become a horticulturist myself, but the society has done a wonderful lot in this state along the fruit line, apparently to

outsiders it appears to be a fruit and nurserymen's association. If I go out as a florist among florists and ask them why they do not belong to the State Horticultural Society, they say, "What good does it do us, we cannot get anything from it?" The same among greenhouses and vegetable growers. It seems to me the time has come now when the society ought to branch out and take up some of these other branches. The best way to do that would be to encourage them to organize societies of their own under the head of this society and if this society could have meetings and give each of these branches a special session and then at the end probably give them a session for amateur horticulturists it would be one step in the right direction. That thought has come to me this afternoon, I do not know whether it would be practical or not.

The Secretary: I would not say anything at all, except that I wish to approve most heartily everything Miss Harper has said. I am absolutely certain that she is right in all particulars and that there is no better and bigger work that we could undertake than to push this matter of home gardening if we could see our way clear to do it, and I have no doubt in the near future we may be able to take up some work of that kind. But lest the opinion should be accepted that this society gives attention only to apples and fruit growing I want to state that by just a hasty glance over our reports and proceedings and our magazine, I find that since the magazine was started in September, 1910, that thirty per cent of space has been devoted to other topics than fruit growing, that is very nearly one-third and I think the esthetic side of horticulture has the best end of it. I found forty-six per cent of the programs of the summer meetings have been devoted to other topics than those concerning commercial fruit growing, and almost wholly to the home, and I am well convinced that a careful scrutiny of our reports and proceedings would show even a higher percentage than that. I speak in this way because I have had the duty of making up the program and the society has left it largely to me for the past seven years, but I will say this, you can have anything you ask for if you will ask often enough and loud enough. I want you to keep that strictly in mind, it is the members of the society that control the society and it positively is not the secretary. I can go one step farther than that, although it is going a little bit outside of the subject,

that if anything has been accomplished by the society, it is due to the united attitude and the loyalty of the membership body. If you want this thing, you most certainly can have it. We will be immensely glad to get a larger increased membership in Milwaukee county and city, although we have the largest membership in the state today from Milwaukee county and constantly increasing. We have ten members from the city of Milwaukee where we had one five years ago, but we want a thousand more from the city. There is this danger, while I agree perfectly with all that has been said, that the State Horticultural Society, within its limited appropriation of eight thousand dollars, will spread itself out too thin so that you can stick a pin through anywhere. Is it not better to strike hard in one or two places and if we are going to strike hard, shall we not strike hard along those points that give the greatest returns to the people of the state? I can point to you where hundreds of thousands of dollars, approaching the millions, have been invested and the industries of the state have been developed, thousands of dollars for every dollar that has been spent. It is true it has been in orchard fruit growing, we are striking hard along that line, the time is ripe now. We are having a greater development in fruit growing than in any other line. Shall we not unite our forces and energies along that particular line to make, as we wish and we hope, Wisconsin the leading fruit growing state in the Union as it is the leading dairy state? Then when we get a little time, we will do all these other things. We will take up the matter of gardens as we are taking up the school grounds. Keep in mind, one of the leading lines of our work is the improvement of 7,500 rural school grounds. While we have only six of them started, mark you, we are going to do that thing, we are going to make the grounds of the rural schools in Wisconsin better than those of any other state in the United States. In the meantime, let us strike hard in one or two spots.

Miss Harper: May I suggest that the horticultural magazine published by the society should be divided in such a way that certain pages and a certain amount of space should be given every month to certain departments of horticulture? Or give a certain number every year, say, spring number for vegetable gardens; others to flower gardening and others to

truck gardening; others to greenhouses, then give the balance if you want to, to fruit.

THE COST OF PRODUCING SMALL FRUITS.

A THESIS SUBMITTED FOR THE DEGREE OF BACHELOR OF SCIENCE IN AGRICULTURE.

(University of Wisconsin, 1911.)

BY ROBERT LEWIS POST.

OBJECT AND SCOPE

The purpose of this thesis is to determine the cost of producing certain small fruits. The fruits considered are the strawberry, red and black raspberries, the gooseberry, and grape. The plantation producing the fruit from which the estimates herein presented are taken is situated about three miles west of the market of the city of Madison, Wisconsin. It supplies a retail market, consequently, the culture is more intensive and the acreage more limited than that of similar plantations which supply a wholesale market. This fact, together with the high price of the land, serves to make the cost of production comparatively high.

METHODS OF CONDUCTING WORK

Most of the data relative to labor are based upon estimates made by persons intimately acquainted with the work. For such operations as uncovering strawberries or cultivating, where the work is not seriously interrupted, estimates were made for each piece of work and reduced to terms of each individual area in order to facilitate tabulation. For other operations, such as hoeing and pruning, in which the work is frequently interrupted. observations were made for one row, or a similarly limited portion, and this reduced to terms of each individual area. Wherever possible several estimates or observations were made, representing the probable average of a series of years or a variety of conditions. The cost is assumed to be 20 cents per hour for man labor, and 10 cents per hour for horse labor. Where the work was done by boys, allowance was made for the lower wages and the longer time required for doing the work.

In securing the data for returns from the various plantations access was had to records of production and price covering a series of seven or eight years, beginning with 1903.

The picking is done by boys and girls ranging from ten to eighteen years of age, most of whom are so situated that they do not take a direct interest in the work. For this reason at least one and often two persons are required to supervise the picking and care for the fruit. The fruit, if gathered in the forenoon, is hauled directly to market, that picked in the afternoon being held over night and placed on the market the next morning. The marketing requires the time of a man and a horse for the larger part of the day. The expense of the man in charge of the picking, and the time required to market the fruit is divided proportionately among the various crops in such a manner as to be approximately correct when reduced to terms of acres. For the raspberries, currants and gooseberries the time appears to be rather short, but this apparent discrepancy is due to the fact that these fruits are often handled in one operation. If some of the estimates appear high we must remember that many items, such as depreciation of buildings, wagons, and picking utensils, are not included.

The various fruits are grown in relatively small plots which are frequently rotated. Most of these plots are less than an acre in extent, but in the final estimate all the figures are reduced to the acre basis. The dimensions of the individual plots were secured either by measuring or by counting the number of rows and determining the distance by multiplying by the distance between the rows.

DEFINITION OF TERMS

In the discussion which follows, certain terms have been employed which require definition.

The term "picking" includes not only the work of the pickers, but also that of the overseer.

"Marketing" includes, besides the hauling of the fruit to market, the cost and making of the boxes.

THE STRAWBERRY

Since the strawberry is the most popular and the most extensively grown of the small fruits it probably deserves the major

consideration. The methods of culture and the length of rotation are comparatively uniform, consequently fairly accurate estimates are possible. The plots are kept in bearing either three or four years. In order to strike an average it is assumed that four calendar years of work, including the year of planting, will produce three crops.

In planting, the rows are set four feet apart, the ability of the particular variety to produce runners. Several varieties are included in the plantings, the most important being Senator Dunlap, Bederwood, Aroma, Brandywine, Jessie, and Pocomoke.

The returns are computed from records of production and price covering the period from 1903 to 1910 inclusive, all the fruit being placed upon the Madison market as previously described.

Four newly set plots and six bearing plots are used in determining the cost of planting and caring for the crops. These plots range from one-eighth to one-half acre in extent. *Table I shows the cost of caring for the newly set plots, while Table II gives the figures for the six bearing patches.

Summary of Table I. New plots	
Cost per acre—labor	$71.94
Cost hauling mulching	19.20
Interest and taxes	16.00
Total cost per acre	$107.14

Summary of Table II. Bearing plots	
Cost per acre—labor	$53.60
Picking overseer	14.00
Pickers	50.00
Marketing—man and horse	18.00
Boxes and making	14.66
Hauling mulching	19.20
Interest and taxes	16.00
Total cost per acre	$185.46

From the above figures it will be seen that the cost of producing a quart of strawberries under the above conditions is approximately 5.5 cents, which at the average price of 9 cents per quart yields a net profit of 3.5 cents per quart.

THE RASPBERRIES

With the raspberries accurate estimates are more difficult to make than with strawberries. The number of years of bearing

* Tables giving details omitted and only summary given in each case—ED.

and the time required to bring them into full bearing are both somewhat variable. The average period of bearing is assumed to be eight years for the blacks and seven for the reds. The blacks usually require but one year, that of planting, to come into bearing, while the reds require at least two years. About one acre of black and one-fourth to one-third acre of red raspberries are ordinarily maintained in bearing on the place under consideration.

The raspberries are planted about three feet apart in rows ranging from five to seven feet apart. Among the varieties of blacks are the Cumberland, Nemaha, Ohio and Kansas. The most important red varieties are the Cuthbert, Marlboro and Miller.

As for strawberries the returns are computed from records of production and price covering the period 1903–1910 inclusive, all the fruit being disposed of on the Madison market.

One newly set plot and four bearing plots are used in determining the cost of producing black raspberries. For the red raspberries one newly planted plot and one bearing plot are used. These plots range from one-tenth to two-thirds of an acre in area. Table IV shows the cost of caring for the new plot of black raspberries. Table VII shows the cost of caring for the new plot of red raspberries the first year, and table VIII the second year. Table V gives data for the bearing plots of black raspberries, and table IX for the bearing plot of red raspberries. Tables VI and X are brief statements of the cost and returns of the black and red raspberries respectively.

Summary of Table IV. New plot of black raspberries.

Cost of labor per acre	$47.34
Interest and taxes	16.00
Total cost per acre	$63.34

For the bearing plots the items making up this expenditure rank approximately as follows:—

Picking	30 per cent
Marketing	16 "
Pruning and training	16 "
Interest and taxes	11 "
Pruning	10 "
Miscellaneous	17 "

TABLE VI

Cost:	
1st year—not bearing	$63.34
8 years—bearing	1,116.56
Total	$1,179.90
Average cost per acre	131.10
Returns:	
8 crops—2000 qts. at 12 cents per quart	$1,920.00
Av. yearly return (9 yrs.)	213.33
Annual net return	82.23

From the above figures we find that the cost of producing a quart of black raspberries is approximately 7.4 cents which, at the average price of 12 cents per quart, yields a net profit of 4.6 cents per quart.

Summary of Table VII. New plot of red raspberries 1st year.

Cost of labor per acre	$44.93
Interest and taxes	16.00
Total per acre	$60.93

Summary of Table VIII. New plot of red raspberries 2nd year.

Cost of labor per acre	$22.93
Interest and taxes	16.00
Total per acre	$38.93

Summary of Table IX. Bearing plot red raspberries.

Cost of labor per acre	$27 62
Marketing—man and horse	22.50
Boxes and making	8.73
Picking—overseer	20.00
Interest and taxes	16.00
Total	$114.85

The items of expenditure for the red raspberries rank approximately as follows for the bearing plots:

Picking	35 per cent
Marketing	27 "
Pruning	14 "
Interest and taxes	14 "
Miscellaneous	10 "

TABLE X

Cost:	
1st year—not bearing	$60.93
2nd year—not bearing	38.93
Next 7 years—bearing	803.95
Total	$903.81
Av. cost per year	100.42
Returns:	
7 crops—1000 quarts each at 20 cents per quart	$1,400.00
Av. annual return	155.55
Annual net return	55.13

Tht above figures show that the cost of producing a quart of red raspberries is approximately 12.9. This, at the average price of 20 cents per quart, leaves a net profit of 7.1 cents per quart.

CURRANTS AND GOOSEBERRIES

Since no newly planted plots of these fruits were available for observation only the cost of maintenance is considered in this particular case. One-fourth acre of gooseberries and one-third acre of currants are maintained.

The bushes are planted about five feet apart each way. Of the currants such varieties as Red Dutch, Victoria, and Long Bunch Holland are grown. Only one variety of gooseberries, the Downing, is grown.

The returns are computed from records of production and price kept during the period 1903--1909 inclusive in the case of the currants, and 1904 to 1909 inclusive for the gooseberries.

Table XI shows the cost of caring for the two bearing plots of currants, which are counted as one plot in the estimate. Table XIII gives similar data for the gooseberries. Tables XII and XIV sum up briefly the cost and returns for these crops.

Summary of Table XI. Bearing plot of currants.

Cost of labor per acre	$43.00
Marketing—man and horse	24.45
Boxes and making	17.22
Picking—overseer	21.74
Pickers	58.75
Interest and taxes	16.00
Total	$181.16

The items of expenditure for maintenance of the currants, as shown by the above figures, rank approximately as follows:

Picking	44 per cent
Marketing	24 "
Hoeing	9 "
Pruning	9 "
Interest	9 "
Miscellaneous	5 "

TABLE XII

Gross returns—1 crop—4700 quarts at 9 cents	$423.00
Average cost per year	181.16
Annual net return	241.84

From these figures we find that the cost per quart for maintenance only is about 3.8 cents, which at the average price of 9 cents per quart yields a net profit of 5.2 cents per quart.

Summary of Table XIII. Bearing plot of gooseberries.

Labor—cost per acre	$33.33
Marketing—man and horse	23.88
Boxes and making	11.00
Picking—overseer	15.87
Pickers	30.00
Interest and taxes	16.00
Total	$130.00

For the cost of maintenance of the gooseberries, the items of expenditure rank approximately as follows, according to the above figures:

Picking	35 per cent
Marketing	27 "
Interest and taxes	12 "
Hoeing	12 "
Pruning	8 "
Miscellaneous	6 "

TABLE XIV

Gross returns—1 crop—3000 quarts at 8 cents	$240.00
Average cost per year	130.00
Annual net return	110.00

According to the above table the cost per quart for maintenance of gooseberries is about 4.3 cents. At the average price of 8 cents per quart the net profit per quart is 3.7 cents.

THE GRAPE

Although the grape, strictly speaking, is not a small fruit, it is interesting for study in this connection because it is not ordinarily considered a safe commercial venture in Wisconsin. In the case under consideration, however, it appears to be fairly remunerative when grown on a small scale, and for this reason it is included in this thesis. Only the cost of maintenance of the vineyard already established is considered, it being practically impossible to secure accurate estimates of the cost of starting the vineyard.

The vines are planted eight feet apart each way. The most important varieties grown are Moore's Early, Worden, Concord, Brighton, and Delaware.

The returns are computed from records of production and price kept during the period 1904—1909 inclusive.

Table XV shows the cost of caring for the one bearing plot, and table XVI is a brief summary of the cost and returns for the grapes.

Summary of Table XV. Bearing plot—Grapes.

Labor—cost per acre	$92.32
Picking and marketing	16.83
Interest and taxes	16.00
Total cost per acre	$125.15

The relative proportion of each of the various items of cost for grapes is somewhat different than for the other fruits, as shown in the following:

Pruning and training	32	per cent
Hoeing	16	"
Picking and marketing	13	"
Interest and taxes	13	"
Laying down and covering	11	"
Miscellaneous	15	"

TABLE XVI

1 crop—2600 pounds at 10 cents per pound	$260.00
Average cost per acre	125.15
Net annual profit	134.85

According to this table the cost of maintenance for each pound of grapes is about 4.8 cents. At the average price of 10 cents per pound the net profits per pound is 5.2 cents.

GENERAL DISCUSSION OF RESULTS

The cost per quart is appreciably less for the production of strawberries than for raspberries. We have seen that the cost per acre is greater, therefore we must conclude that the above mentioned difference is due to the greater yield of strawberries per acre. The currants and gooseberries cannot be compared directly with the above because only the cost of maintenance is considered. According to the figures showing this cost it appears that the actual cost of production per quart for these fruits is approximately equal to that for strawberries. The net return per quart for strawberries is also considerably less than for raspberries and currants, being about equal to that for gooseberries. The yield, however, is about double that of raspberries, making the net return per acre much greater. This difference in yield is due to the prevalence of anthracnose among the raspberries, also to the fact that some of the plots were far past their prime. The gooseberries show an annual net return per acre nearly if not quite equal to that of strawberries. The currants are by far the most profitable crop, showing a larger net return per quart, and producing a higher yield than strawberries, even though the cost of starting the plantation be considered. It must be remembered, however, that only a small fraction of an acre of either currants or gooseberries are maintained, while three and one-half acres of strawberries are usually in bearing.

The ratio of the cost of new patches to that of bearing ones is about 1:1.7 for strawberries and 1:2 on the average for raspberries. This difference in proportion is probably due to the large amount of hoeing and training of runners necessary for strawberries the first year.

The proportion of the cost of horse labor to the total cost is larger for the strawberries than for the other fruits. This is because horses are used for working over the strawberry beds after picking and also for hauling and mulching for winter covering.

SOURCES OF ERROR

Undoubtedly many errors have crept into our computations, their sources being various, and perhaps in some cases compensating. One of these is probably made because several estimates and observations are taken on a very small basis. The error,

for example, in finding the length of time required to hoe one row of strawberries is multiplied by the number of rows in one acre. With the exception of strawberries the larger number of estimates given are made for small fractions of an acre. The errors of course are multiplied two, three or four times in calculating on the acre basis. An accurate estimate of the yields also is difficult with strawberries and especially with raspberries, because the acreage has been variable. The figures for the yields of the currants, gooseberries and grapes may be considered as accurate because the acreage has been constant during the period in which the yields are recorded. The estimates for labor, although subject to error for the above mentioned reason, are based upon many years' experience and are probably fairly accurate. The figures for the yield of strawberries may be considered fairly accurate because the average planting is about equal to the amount plowed under, although the average area may be a little more or less than three and one-half acres. The errors in estimates for labor are probably compensating because many different areas or conditions are accounted for. The raspberries are probably the only fruits in which the figures given may be seriously questioned. Often a season may pass with no new planting or no plowing under of an old plot, producing a relatively large fluctuation in the area maintained. This is especially true of the red raspberries.

REVIEW OF PREVIOUS AND RELATED WORK

So far as the author is aware no careful study has been made of the cost of producing small fruits. Many persons, however, have made estimates, as follows:

At the New Hampshire Experiment Station H. F. Hall[1] in 1908 estimated the cost of production, with average yield and profit, from one acre of strawberries as shown below:

Interest and tax on land (2 years)	$4.00
Plowing	3.00
Harrowing	3.00
Fertilizer	50.00
Plants	30.00
Setting plants	10.00
Cultivation	50.00
Training and cutting runners	10.00
Fall mulch	10.00
Adjusting mulch for summer	10.00
Total cost of growing	$180.00

[1] New Hamp. Exp. Sta. Bul. 137.

Crates and baskets	30.00
Cost of picking (8000 quarts at 1½ cents)	120.00
Total outlay	$330.00
Value average crop—8000 quarts at 8 cents wholesale	$640.00
Net returns (2 years)	310.00
Annual profit	155.00

As the author of this estimate states, this profit seems rather low to one who sells to a retail market, but is good profit to the grower who has a wholesale market.

These figures are evidently based upon the assumption that there is but one bearing season. This indicates that the total outlay given represents the cost of producing the first and apparently the only crop. On the same basis my data would read about as follows:

Interest and taxes (2 years)	$32.00
Preparing land	2.01
Digging plants	3.92
Setting plants	14.35
Cultivating	3.15
Hoeing	39.20
Covering	9.18
Uncovering	3.06
Hauling mulch for covering	19.20
Weeding	11.43
Picking (overseer)	14.00
Pickers	50.00
Boxes and making	14.66
Marketing	18.00
Total outlay	$234.16
Average value crop—4000 quarts at 9 cents	360.00
Net return	125.84
Annual net return per acre	62.92

The chief reasons for the difference between this and the estimate previously mentioned are probably the higher value of the land, the lower yield, and the addition of the marketing item. We must remember, however, that in our case the plots are kept in bearing three years with an annual net profit of over $100 per acre for each of the four years during which the land is occupied. This is accomplished under average conditions, while Hall's estimate undoubtedly assumes a maximum yield.

From data obtained by L. H. Baily from representative growers in Oswego region of New York about 1900 the following results were obtained:

Cost of growing one acre of strawberries:[1]

Rent of land (2 years)	$11.00
Plowing and fitting	6.00
Plants	15.00
Setting plants	4.00
Cultivation	16.00
Straw for winter and fruiting mulch	15.00
Labor—hoeing, pulling weeds, etc	10.00
Total cost	$77.00

This evidently includes only the year of planting. The estimate is rather low as compared with ours which is $107.14 for the year of planting. The present higher prices of both land and labor are probably the chief modifying factors.

Mr. E. A. Richardson[2] of the Sparta Fruit Growers' Association states that the expense for preparing the ground, plants, planting, cultivating, hoeing, mulching, and rent for one acre of strawberries is approximately $45.00. This also includes only the year of planting, and is less than half of our estimate for that year. The wholesale market, resulting in less intensive cultivation, probably accounts in part for this low figure. The cost of labor also was no doubt placed at a lower rate. It is also stated that this estimate applies equally well to bush fruit, and that the net returns are about the same.

At the Colorado Station B. O. Longyear[3] obtained estimates from various parts of the state in 1909 regarding the cost of growing strawberries. One grower who kept records for one year stated that the total expense (excepting rental or interest) was $105.00. This is evidently for a bearing season. Another grower estimated that $125.00 to $150.00 would be required to grow an acre in the best manner. He does not state whether the year of planting or a year of bearing or both are included. Longyear concludes that the average annual expense is about $100.00 per acre. Assuming a yield of 300 crates per acre the cost of producing one crate ready for market is estimated at $1.15. The price is $2.00 per crate, leaving a profit of $0.85 per crate. The ratio of cost to net profit is therefore 1.36:1, somewhat lower than our computation of 1.59:1, although the net profit per acre is about two and one-half times as great as ours. Many growers in that region estimated roughly that one-half the price was profit.

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[1] N. Y. Cor. Bul. 189.
[2] Bul. No. 17, Wis. State Hort. Society.
[3] Colo. Exp. Sta. Bul. 140.

The above figures, however, are probably more accurate, because the general tendency where records are not kept is to underestimate the cost of production.

Through the courtesy of Mr. E. E. Dunning of Milwaukee I was enabled to secure reliable estimates on the cost of producing currants and gooseberries. He states that the best varieties of currants would cost from $250.00 to $300.00 the year of planting. From these and other figures which he gives I presume that each of the next two years would cost $100.00 per acre. For each of the ten years of bearing the labor costs $125.00, and the picking, marketing and commission $131.25, making a total of $256.25. This does not include interest on the investment which would add $25.00 to $50.00 more. The average yield for good varieties is about 350 crates per acre. At the average market price of $1.50 per crate the selling price would be $525.00. If Mr. Dunning's minimum estimate of the interest be added to the cost, the net profit is $244.75 per acre, about equal to the profit arrived at in our investigation, only the cost of maintenance being considered in each case. The cost and profit for the gooseberries are approximately the same as for currants. The net profit is therefore more than double that which our figures indicate. It must be remembered that Mr. Dunning's estimates are based upon observations of the best varieties, given the most painstaking care.

CONCLUSIONS

1. Owing to the system employed in this investigation it is exceedingly difficult to make definite statements regarding the cost of production and the relative merits of the various small fruits. Consideration of the sources of error above mentioned will justify this assertion.

2. The currants are obviously the most profitable of the small fruits under our conditions. Even if the cost of starting them were taken into account we might safely count on a net profit of nearly, if not quite, $200.00 per acre, this acreage including the young plots as well as the bearing ones. The strawberries come next with about $104.00 per acre. The grapes and gooseberries probably rank next in the order named, although exact figures are not available, for the same reason as with currants. The black raspberries rank fifth and the red raspberries sixth, although the actual profit cannot be stated with certainty because of the above mentioned sources of error.

3. The cost per acre is greatest for the currants, probably amounting to $200.00. The strawberries are second with an average cost of $165.00 per acre. In all probability the cost of both gooseberries and grapes are each about equal to that of strawberries if the cost of starting them be considered. The black raspberries are fourth with a cost of $131.00 per acre, and the red raspberries last with a cost of $100.00 per acre.

4. A careful study of the cost of producing small fruits, if covering a series of years or even one year, might reveal some interesting facts. Many errors could be corrected, and the possibility of lessening the expense and increasing the net profit, or even of eliminating the least profitable crops, might be shown.

5. It should be remembered that on the place under consideration there are several sources of income other than the small fruits. The determination of the cost of production should include the other crops as well. If this were done a change more or less radical in the organization of the farm might be accomplished. Competing crops could be at least partially dispensed with and others substituted to the best interest of all concerned.