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ANNUAL REPORT

OF THE

Wisconsin State Horticultural Society

For the Year Ending July 1, 1919

VOL. XLIX

F. CRANEFIELD, Editor
Madison, Wis.

MADISON, WISCONSIN
Democrat Printing Company, State Printer
1919

LETTER OF TRANSMITTAL

MADISON, WIS., March 1, 1919.

To His Excellency, EMANUEL L. PHILIPP,

Governor of Wisconsin.

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

Respectfully,

FREDERIC CRANEFIELD,

Secretary.

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OFFICERS AND COMMITTEES FOR 1919

OFFICERS.

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J. A. HAYS, Vice President ..... Gays Mills
F. CRANEFIELD, Secretary-Treasurer ..... Madison

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FRUITS RECOMMENDED FOR CULTURE IN WISCONSIN

The behavior of varieties of fruits is influenced very largely by their environment. The conditions of soil, exposure and latitude over such an extensive area as the state of Wisconsin vary greatly and no list can be given that will prove satisfactory in all localities. 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, Livland Raspberry, Longfield, Lubsk Queen, McIntosh, Malinda, McMahan, Newell, Northwestern Greening, Oldenburg (Duchess), Patten Greening, Perry Russett, Scott, Talman (Sweet), Utter, Wealthy, Westfield (Seek-no-Further), Windsor, Wolf River.

APPLES (Lake Shore List).

In addition to the above many other varieties including the following may be successfully grown in the southern part of the state and in the counties bordering on Lake Michigan: **Eureka, Fallawater, Gano, King, Northern Spy, Pewaukee, Willow Twig, York Imperial, Bellflower.**

APPLES (Commercial Orchard List).

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

APPLES (Five Varieties for Farm Orchard).

Northwestern Greening, Oldenburg (Duchess), Talman (Sweet), Wealthy, Windsor.

CRABS.

Hyslop, Martha, Sweet Russett, 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, Hammer, Hawkeye, Quaker, Surprise, Wolf.

EUROPEAN PLUMS.

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

JAPAN PLUMS.

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

CHERRIES.

Early Richmond, Montmorency.

GRAPES.

Brighton, Concord, Delaware, Diamond, Moore's Early, Niagara, Worden.

BLACKBERRIES.

Eldorado, Snyder.

STRAWBERRIES.

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

Aroma, Bubach, *Crescent, Dunlap, Enhance, Gandy, Glen Mary, *Haverland, Lovett, *Sample, Splendid, *Warfield.

TWO VARIETIES STRAWBERRIES FOR FARM GARDEN.

Dunlap, *Warfield.

RASPBERRIES.

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

CURRANTS.

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

GOOSEBERRIES.

Downing.

PEARS.

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

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

TREES AND SHRUBS RECOMMENDED

LARGE DECIDUOUS TREES

American Elm	Ulmus Americana
Black Cherry	Prunus serotina
Carolina Poplar	Populus monilifera
Bolles Poplar	Populus Bolleana
White Ash	Fraxinus Americana
Green Ash	Fraxinus viridus
Hackberry	Celtis occidentalis
Honey Locust	Gleditschea triacanthos
European Larch	Larix Europaea
Linden (Basswood)	Tilia Americana
Norway Maple	Acer platanoides
Scarlet Maple	Acer rubrum
Silver Maple	Acer dasycarpum
Sugar Maple	Acer saccharinum
Scarlet Oak	Quercus coccinea
Red Oak	Quercus rubra
White Oak	Quercus alba
Weeping Willow	Salix Babylonica
Kentucky Coffee Tree	Gymnocladus Canadensis
Paper Birch	Betula papyrifera

FOR STREETS AND HIGHWAYS

American Elm
Norway Maple
Linden

SMALL DECIDUOUS TREES

Western Crab Apple (native)	Pyrus Ioensis
Bechtel's double fl. Crab	Pyrus var. Bechtelii
Cut-leaved Birch	Betula alba var.
Paper Birch	Betula papyrifera
Tartarian Maple	Acer Tartaricum
Mountain Ash (native)	Pyrus Americana
Juneberry	Amelanchier Canadensis
Hawthorn	Crataegus Crus-galli
Russian Mulberry	Morus alba var. Tartarica

LARGE EVERGREENS

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

Norway Spruce	Picea excelsa
White Spruce	Picea alba
Colorado Blue Spruce	Picea pungens
White Pine	Pinus Strobus
Austrian Pine	Pinus Austriaca
Scotch Pine	Pinus sylvestris
Red Pine	Pinus resinosa
Arbor Vitae (White Cedar)	Thuja occidentalis

SMALL EVERGREENS

Dwarf Juniper	Juniperus communis var.
Sabin Juniper	Juniperus Sabina
Mugho Pine	Pinus Montana var. mughus
American Yew	Taxus Canadensis
Waukegan Juniper	Juniperus horizontalis
Japanese Trailing Juniper	Juniperus procumbens

SHRUBS

Alpine currant	Ribes Alpinum
Thunberg's Barberry	Berberis Thunbergii
Japanese Rose	Rosa rugosa
Weigelia	Diervilla florida
Winged Burning Bush	Euonymus alatas
Weigela (Eva Rathke)	Diervilla hybrida
Silver Berry	Eleagnus argenta
Strawberry Tree	Euonymus Europaeus
Garden Hydrangea	Hydrangea paniculata gr.
Ruprecht's Honeysuckle	Lonicera Ruprechtiana
Tartarian Honeysuckle	Lonicera Tartarica
Morrow's Honeysuckle	Lonicera Morrowi
Mock Orange	Phialdelphus coronarius
Mock Orange large	Philadelphus inodorus
Shrubby Cinque Foil	Pontentilla fruticosa
Russian Almond	Prunus Nana
Smoke Bush	Rhus Cotinus
Missouri Flowering Currant	Ribes aureum
Rose Acacia	Robinia hispida

Golden Elder	Sambucus nigra var. aurea
Buffalo Berry	Shepherdia argenta
Bumalda Spiraea	Spiraea Bumalda
Billard's Spiraea	Spiraea Billardii
Douglas' Spiraea	Spiraea Douglassi
Spirea Callosa	alba and rubra
Meadow Sweet Spiraea	Spiraea salicifolia
Van Houten's Spiraea	Spiraea Van Houtte
Persian Lilac	Syringa Persica
Common Lilac	Syringa vulgaris
Snowball	Viburnum Opulus vr. sterile
Summer Snowball, Hardy Hydrangea	Hydrangea arborescens
Wayfaring Tree	Viburnum lanitana
Cut leaf Elder	Sambucus Canadensis var. acutiloba

ROSES

Hardy garden—Rosa rugosa, Harrison Yellow, Persian Yellow, Michigan Prairie Rose, Madame Plantier.

Hybrid perpetual—Paul Neyron, Mrs. J. H. Laing, Gen. Jacqueminot, Marshall P. Wilder, Magna Charta, General Washington, Conrad F. Meyer.

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

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

COMPARATIVE HEIGHT AT MATURITY OF DIFFERENT SHRUBS

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

The following may serve as a partial guide in planting:

Tall 8–12, sometimes 15 feet.

Lilac, Common	Lilac, Persian
Lilac, Japanese	Mock Orange
Common Elder	Honeysuckle, Slender
Buffalo berry	Siberian Pea Tree (tall)

Medium—5–7

Crandall Currant
Silver Berry
Honeysuckle, Blue
Strawberry Tree
Japanese Rose
Spiraea, Billard's
Spiraea Douglas
Spiraea Three-lobed
Rose Acacia
Spiraea, Van Houten's
Russian Almond
Siberian Pea Tree (dwarf)
Weigelas
Japanese Rose

Dwarf—2–4

Alpine Currant
Barberry, Thunberg's
Spiraea, Ash-leaved (Sorbaria)
Spiraea, Bumalda
Honeysuckle, Albert's
Spiraea, Japanese
Hydrangea
Spiraea, Meadow Sweet
Spiraea Plum-leaved

NATIVE SHRUBS SUITABLE FOR PLANTING ON HOME GROUNDS

Common Name.	Scientific Name.
Bearberry	Arctostaphylos Uva-ursi
New Jersey Tea	Ceanothus Americanus
Button Bush	Cephalanthus occidentalis
Round-leaved Dogwood	Comptonia asplenifiora
Red Osier Dogwood	Cornus stolonifera
Grey Dogwood	Cornus paniculata
Bailey's Dogwood	Cornus Baileyi
Leatherwood (Wickopy)	Dirca palustris
Wahoo	Euonymus atropurpureus
St. John's Wort	Hypericum pyramidatum
Winterberry (Holly)	Ilex verticillata
Trailing Juniper	Juniperus procumbens
Ninebark	Physocarpos opulifolia
Staghorn Sumac	Rhus Typhina
Smooth Sumac	Rhus Glabra
Dwarf Sumac	Rhus copalina
Wild Rose (tall)	Rosa lucida
Wild Rose (dwarf)	Rosa blanda
Prairie Rose	Rosa setigera
Swamp Rose	Rosa Carolina
Purple-flowered Raspberry	Rubus odoratus
White-flowered Raspberry	Rubus Nutkanus
Common Elder	Sambucus Canadensis
Scarlet Elder	Sambucus pubens
Snowberry	Symphoricarpus racemosus
Coral Berry, Indian Currant	Symphoricarpus vulgaris

Ground Hemlock	Taxus Canadensis
Sheepberry	Viburnum lentago
Arrow Wood	Viburnum dentatum
Dockmackie	Viburnum acerifolium
Bush Cranberry	Viburnum Americanum
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 (Bridal Wreath), Thunberg's Barberry.

THREE HARDY VINES

Engelmann's Ivy, Wild Grape, Trumpet Honeysuckle.

SIX HARDY HERBACEOUS PERENNIALS

Phlox, Peony, Larkspur, Bleeding Heart, Lily of the Valley, Day Lily.

BLACK LIST

A LIST OF SHRUBS ALL OF WHICH HAVE BEEN TESTED AND FOUND NOT SUFFICIENTLY HARDY FOR GENERAL PLANTING

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
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
Althea	Hibiscus Syriacus
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
Thunberg's Spiraea	Spiraea Thunbergil

The plants of certain of the above named varieties made a good growth each year but did not blossom 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 did not bear flowers except when given winter protection. The Goumi will bear fruit only 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 either died outright or else barely survived.

HARDY PERENNIALS

Scientific name.	Common name.
Achillea ptarmica, The Pearl or Boule de Niege	Milfoil
Aquilegia, long spurred Hybrids and many varieties	Columbine
Boltonia, asteroides and latisquama	False Chamomile
Campanula persicaefolia	Peach Bells
Coreopsis lanceolata	Tickseed
Delphinium	Larkspur
Belladonna	
Formosum	
Hybrids	
Dianthus plumarius	Grass Pink
Gaillardia grandiflora	Blanket Flower
Gypsophila paniculata	Baby's Breath
Hemerocallis, several varieties	Day Lily
Iris, scores of varieties	Fleur-de-lis
Mad. Chereau	
Honorabilis	
Silver King	
Queen of May	
pallida dalmatica	
orientalis blue	
Papaver Orientale	Oriental Poppy
Peony, Many varieties,	
Six good ones:	
Rubra Superba, late red	
Felix Crousse, Midseason red	
Marie Lemoine, Late White	
Festiva Maxima, Early white	
Mad. Emile Gaille, Shell pink	
Edulis Superba, Early pink	
Phlox, many varieties	Phlox
Seven good ones:	
Elizabeth Campbell, Light salmon pink	
Europea, White, carmine eye	
Mrs. Jenkins, White	
B. Compte, French purple	
R. P. Struthers, Bright rosy red	
Beranger, Delicate pink	
Miss Lingard, Early white, pink eye	
Platycodon grandiflorum	Balloon Flower

Pyrethrum Uliginosum	Giant Daisy
Pyrethrum roseum	Persian Daisy
Chrysanthemum maximum	Shasta Daisy
Rudbeckia purpurea	Purple Cone Flower
Sedum spectabile	Stonecrop
Veronica spicata	Speedwell

Eight Perennials for every garden. Peony, Iris, Phlox, Delphinium, Oriental Poppy, Gaillardia, Dianthus plumarius, Shasta Daisy.

NATIVE PERENNIALS ADAPTED TO PLANTING IN HOME GROUNDS

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

REMEDIES FOR THE CONTROL OF INSECTS AND DISEASES

INSECTS.

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 gallons

Paris green is heavier than water and the mixture must be kept in constant motion during spraying operations to prevent settling.

Never buy Paris green or other insecticides in bulk; always demand the original package with the manufacturer's guarantee of purity.

Paris green if used on growing plants greatly in excess of the above formula may injure the foliage. The addition of the lime overcomes the caustic properties and renders it safe under all conditions.

Dry Paris green may be used pure if applied in small quantities with plaster of Paris or finely slaked lime as a carrier. Different "dry powder guns" have been invented for this purpose.

While Paris green, if pure, is a valuable insecticide, it has been displaced in orchard spraying by ARSENATE OF LEAD.

Arsenate of Lead

(A poison for biting insects.)

Formula (1)

Arsenate of lead—paste	2 to 3 lbs.
Water	50 gallons

Formula (2)

Arsenate of lead—dry or powdered	1½ to 2 lbs.
Water	50 gallons

Arsenate of lead may be used in any reasonable quantity without danger of injury to foliage.

It remains in suspension longer than Paris green.

It adheres better to foliage.

It may be used for any purpose for which Paris green is employed in liquid sprays.

White Hellebore

(For biting insects.)

Powdered white hellebore is sometimes employed to destroy currant and cabbage worms and on fruits and vegetables.

Formula (Hellebore)

White hellebore----------1 oz.
Water----------2 to 3 gallons

It may also be used dry either alone or mixed with flour, land plaster, soot, etc.

White hellebore is scarcely poisonous to the higher animals and may be used freely on fruits and vegetables when these are at any stage of maturity.

In addition to the above various poisons are employed such as Scheele's green, London purple, slugshot, arsenate of lime, arsenate of soda, etc., but the fruit grower will do well to pin his faith to arsenate of lead for the control of biting insects with the exception noted above.

SUCKING INSECTS

Sucking insects such as apple aphis, plum aphis, oyster shell scale and San José scale do not consume either bark or foliage but suck the sap of the plant. These insects cannot, therefore, be destroyed by spraying poison on the bark or foliage. We must attack the insect itself. Spray the insects, not the leaves or bark. For this purpose use either kerosene emulsion, a nicotine solution, or lime sulphur solution.

Kerosene Emulsion

Used only to destroy sucking insects. It must be applied to the insects and cannot be used as a preventive.

Formula for Stock Solution

Dissolve ½ lb. hard soap in 1 gallon of boiling water.

While hot add 2 gals. kerosene.

Churn the mixture violently while hot for 5 to 10 minutes or until it assumes a creamy consistency.

Dilution for Spraying. Before spraying add 10 gallons of water to each gallon of stock solution, thus reducing it to six per cent of oil, which can be safely used on the plants.

Lime Sulphur

(For Sucking Insects.).

While kerosene emulsion is effective for soft bodied plant lice it is not sufficiently caustic to destroy the armored scale insects such as San José and oyster shell scales. For this purpose a combination of lime and sulphur is used.. While lime sulphur may be made at home by boiling together lime and sulphur it is a disagreeable job and owing to the high magnesium content of most Wisconsin lime the home-made product is not apt to be as good as commercial lime sulphur. Very good lime sulphur solution may now be purchased in any quantity from a half-pint package to a barrel.

Formula

For San José and oyster shell scales apply the following strength to *dormant trees only.*

Lime sulphur----------1 part
Water----------8 parts

Lime sulphur at this dilution *must not be used on growing plants.*

Arsenate of lead may be combined with lime sulphur.

Lime Sulphur is also used extensively in combating fungous diseases of plants. Its fungicidal value has been proven to be nearly if not uqite equal to that of Bordeaux mixture.

Formula for use as a fungicide on growing plants: Lime sulphur (commercial) one part; water 35 parts.

Nicotine Solutions

A decoction of tobacco made by steeping, not boiling, tobacco stems or leaves in water in a covered vessel is an efficient remedy for plant lice. One gallon of boiling water may be poured over a pound of tobacco stems and allowed to stand over night. This decoction may be used without dilution but will be effective if diluted with 1 or 2 parts of water, and will be more efficient if used with soapsuds.

For orchard spraying use one of the numerous nicotine compounds offered for sale.

REMEDIES FOR THE CONTROL OF PLANT DISEASES

Bordeaux Mixture

The control of fungous diseases is accomplished by the use of some form of copper salts, usually copper sulphate, known also as bluestone, blue vitrol, etc.

Copper sulphate in combination with fresh lime forms the standard and well-known fungicide, Bordeaux mixture.

Various formulas are quoted, but the following is now accepted as safe and reliable:

Copper sulphate	4 lbs.
Fresh lime	5 lbs.
Water	50 gallons

In general terms, the copper sulphate should be dissolved in one-half of the water, the lime slaked in the remainder and the two solutions poured together. This results in a chemical action giving rise to a new substance preserving the fungicidal properties of the copper sulphate and if properly made will not injure the foliage.

Bordeaux mixture is used as a *preventive* of apple scab, asparagus rust, mildew on grapes, roses and other plants, potato blight and rot, shot-hole fungus on plum and cherry and other fungous diseases.

The two ingredients of Bordeaux mixture may be kept separate in solution without deterioration, but they rapidly lose their value after mixing. Mix only as much Bordeaux as you will use in any one day. The addition of a small quantity, 2 or 3 ounces to 50 gallons, of glucose or cane-sugar serves to preserve the fungicidal properties of Bordeaux indefinitely.

Helpful Hints for Making a Barrel of Bordeaux Mixture in Barrel Lots.

(1) Have on hand three barrels and two pails (wood fiber or galvanized iron).

(2) Twenty-five gallons of water in each of the barrels.

(3) Dissolve 4 pounds of copper sulphate in one barrel by suspending in a coarse burlap as near the surface of the water as possible; in this way it will dissolve in a short time, while if allowed to settle to the bottom it would require several hours to dissolve.

(4) Place the lime in a pail and slake by adding water slowly until a paste is formed. (The lime for Bordeaux mixture should be slaked exactly as for building purposes.)

(5) Pour this lime paste into the second barrel and stir thoroughly.

(6) Add the required amount of arsenate of lead to the lime water.

(7) Now pour into a third (empty) barrel first a pailful of the copper sulphate solution, then a pailful of the lime water, or better, let two persons work at the job, pouring together.

(8) The resultant mixture should be of an intense blue color. If any tinge of green appears it is not good Bordeaux mixture.

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

(10) Sufficient lime must be used to combine with all of the sulphate or harm will result. The formula given above provides an excess, but such excess is preferable to a slight deficiency. Use all of the lime water.

Three Things to Avoid in Making Bordeaux Mixture.

(1) Do not use iron or steel vessels for the sulphate or Bordeaux. Not only will these be corroded but the chemical action resulting from continued contact may injuriously affect the mixture. Tinned or galvanized pails are safe if new or if the tin or zinc coating is intact.

(2) Do not dissolve the sulphate and lime each in 2 to 4 gallons of water and then mix the concentrated solutions; curdling will result and after dilution difficulty will be experienced in keeping the Bordeaux in suspension.

(3) Do not fail to stir the ingredients while mixing and the resultant mixture when spraying.

The Use of Stock Solutions in Preparing Bordeaux Mixture.

If more than one barrel of Bordeaux is required much time may be saved by using stock solutions.

Dissolve 50 pounds, for example, of copper sulphate in 50 gallons of water by suspending in a coarse sack as advised above; slake 50 pounds of lime in another vessel and dilute to 50 gallons; four gallons from the sulphate solution and five gallons from the lime solution will then contain the requisite amount of ingredients for one barrel of Bordeaux.

Such stock solutions may be kept indenfiitely if covered, otherwise the evaporation of water from the sulphate solution would result in a more concentrated mixture and the lime would deteriorate. The lime may be covered with water.

This method of using stock solutions is now employed in all extensive spraying operations. In cases where large quantities of spray material are used elevated tanks are employed from which the solution is drawn directly into the spray barrel or tank.

Lime Sulphur

While Bordeaux has for years been recognized as the standard remedy for fungous diseases, lime sulphur formerly used only as an insecticide is now extensively and successfully used in place of Bordeaux.

Formula

Lime Sulphur, commercial, testing 33 Beaume----------1 part
Water ----------35 parts

Commercial lime sulphurs vary in strength (density); or in other words in the amount of sulphur in solution. The density is most readily determined by using a hydrometer. If the lime sulphur shows a greater density than 33°, as 28° or 29°, then more than 35 gallons of water should be used to one part of lime sulphur; if of a less density, as 34° or 35°, use less water.

Potassium Sulphide

For checking the spread of certain surface feeding fungi, as gooseberry mildew, grape mildew, rose mildew and many of the fungi which cause "damping" of young plants in the seed bed, potassium sulphide may be used to excellent advantage.

Formula

Potassium sulphide----------4 ounces
Water----------10 gallons

The solution must be used as soon as made, as it quickly loses its strength.

Any unused portion of the potassium sulphide should be kept in a tightly corked bottle to prevent loss of strength.

Combining Insecticides and Fungicides

Arsenate of lead may be safely combined with Bordeaux mixture. In fact, in orchard spraying operations it has come to be a common practice to add arsenate of lead to Bordeaux at every application. By this means biting insects and fungi are controlled at a single operation. No other fact is more important than this in spraying.

When using arsenate of lead with Bordeaux always add the arsenate to the lime water, instead of pouring it into the combined copper sulphate and lime; this is important.

Arsenate of lead, lime sulphur solution and nicotine compounds may be combined in spraying.

SPRAY

What?	Why?	How?	When?			Remarks
			1st Spraying	2d Spraying	3d Spraying	
Apple	Scab	Bordeaux Mixture 4-4-50 or Lime Sulphur 1 to 35	Just before blossoms open	Just after blossoms drop	14 days after 2d spraying	
	Codling Moth	Arsenate of Lead combined with Bordeaux 4-4-50 or Lime Sulphur 1 to 35	Just after blossoms drop	14 days later	First week of August for 2d brood	1st and 2d spraying same as 2d and 3d for scab; merely add arsenate of lead to Bordeaux or Lime Sulphur.
	Oyster Shell Scale	Lime Sulphur 1 part L. S. to 8 of Water	March or early April but before growth starts			Do NOT use Lime sulphur, 1 to 8, on growing plants
	Green aphis	As above	As above			
Cherry and Plum	Mildew and Shot-hole fungus	Bordeaux Mixture 3—4—50 or L. S. 1 to 35	When leaves are about ⅓ 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	3d, 4th and 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 ten different points in the state as follows:

Poplar, Maple, Whitehall, Manitowoc, Baraboo, Holcombe, Pewaukee, Gays Mills, Lake Geneva and Weston.

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

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

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

An account is opened with each of the "Model" orchards with the confident expectation that a decided margin 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.

Additional Aims and Purposes of the Wisconsin State Horticultural Society.

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

Chartered by the state of Wisconsin in 1871.

Purely an educational institution.

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

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

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

Issues a monthly magazine, Wisconsin Horticulture, which is sent free to members.

We Answer Questions

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

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

WISCONSIN HORTICULTURE

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

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

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

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

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

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

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

The paper is worth **TEN DOLLARS** a year but may be had by any one for **FIFTY CENTS.**

This price, 50 cents, includes membership in the **STATE HORTICULTURAL SOCIETY.**

No formal application necessary; send fee to secretary.

A dollar bill pays for two years.

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

TRANSACTIONS

OF THE

Wisconsin State Horticultural Society

ADDRESS OF WELCOME

MERLIN HULL, Secretary of State

Mr. President, and members of the Wisconsin Horticultural Society:

I esteem it an honor, as well as a great pleasure, to be able to meet so many good people of Wisconsin who are interested in one of the most important of our activities—one which will become among the greatest of the new industries which are now developing in the State.

Your meeting at this time is held under different auspices than those of a year ago. We are now able to turn our attention from the battle fields of Europe to the fields of peace here at home and the accomplishments of our State during the world crisis. For the first time in four years, we are free from the dangers which beset us and threatened our existence and are able to turn again to our ordinary pursuits and get our bearings for the future.

Wisconsin has made a wonderful record during the past twenty months—a record of many phases. That which will perhaps stand out most prominently is of the achievements of those heroic sons whom we sent to the battle front in Europe to win the fight for democracy. Scarcely secondary in importance were the patriotic efforts of our people here at home in backing up the heroic efforts of our sons abroad.

Wisconsin gave 118,000 of her best young men to make the world a safe and decent place in which to live. Accounts of their

valor and efficiency are yet but fragmentary, and it remains for history to record their deeds in proper form and perpetuate that which they accomplished for the glory of our State and Nation, as well as for the benefits of humanity for generations yet to come. These young men are now turning their faces homeward, and one of our first new duties is to give fitting recognition of their great service to us, and in every formal way possible to express the gratitude which fills our hearts.

While they were performing their great task abroad, we have cause to look with enthusiasm upon the great patriotic service rendered by our people in their support. The citizens of Wisconsin who remained behind responded most generously to every call of the Nation which would aid in winning the war and in bringing these young men safely back to our firesides.

There still remains to be recorded something more than a partial outline of what our State has been doing. We know, however, that there was contributed from almost every home some form of patriotic service which contributed to the grand result. We gave of our moneys $347,000,000 in loans to our government. We contributed $6,250,000 to the Red Cross fund. Approximately five millions were gladly turned over to the Y. M. C. A., Salvation Army, K. of C., and similar societies working for the welfare of our Armies in the camps and in the field. We then united in a war fund drive in which $4,500,000 more were gladly turned over to this great welfare work. In all, Wisconsin spent $365,000,000 within the space of twenty months.

It is only by comparison that we can realize what these sums mean. They were nearly equal in value to that of all the railways in the state. They were more than ten times the value of all the property owned by the State, including all that invested in its State Capitol and various institutions. They were equal in value to one-tenth the assessed valuation of all the property in Wisconsin. They were more than ten times as great as all the tax money contributed annually by the State, county and local governments.

This is indeed a wonderful accomplishment and one which in future years we shall look back upon with pride. And yet what was spent in money is but in small measure of what we gave as a people in the earnest support of every branch of our government through patriotic individual service in the home, in the field and in the factory toward ridding the world of au-

tocracy and in making possible the great democracy of the future.

Wisconsin's war-time achievements, however, are not surprising in view of the character which our people have been developing in the seventy years of its history as a State. It may well be said of Wisconsin that we are a commonwealth of conquered impossibilities. Almost every impossibility which has been alleged of us has been turned into possibility by energy, industry and thrift. I remember well in my boyhood days in the northern portion of the State some of the numerous impossibilities which were alleged against us. It was said that we could not grow corn successfully as we were too far north. Yet we are today growing more and better corn than many of the states which look with disfavor upon our opportunity, and our seed corn wins prizes at the largest shows.

It was also alleged that we had passed into history as a wheat growing state. Still our seed wheat is being shipped to many of the best wheat growing states and our pedigreed grains of all kinds are sought after by the enterprising farmers of all the northern states.

It was only a few years ago that alfalfa was regarded as an impossibility in Wisconsin. But now we recognize that one of the greatest opportunities of our farmers is in this valuable crop.

One of the strongest impossibilities alleged against us was in reference to horticulture. It was doubted even by many of our own people only a few years ago that Wisconsin could grow those finer fruits which are demanded by the markets of the country. Through the intelligent activity and cooperation of you people who have been so instrumental in making the Wisconsin State Horticultural Society what it is, we have overcome that impossibility and Wisconsin's fruits are becoming as famous as many of its other leading products. You are steadily developing this industry. It is not only important to us commercially today, but you have pointed the pathway to the still greater opportunities which our soil and climate afford the horticulturist of the future. You are to be congratulated upon your success. Your services are to be recognized not only for what you have accomplished but for the difficulties which you have overcome, and also for the fact that you have shown such difficulties may be overcome.

You have a wonderful display in the rotunda of this great

Capitol upon this occasion and in itself it is a complete answer to the old idea now far out-of-date that Wisconsin is not a good fruit growing state.

There is a new time coming for us all. The war has opened a new era, one in which there will be tremendous expansion and opportunities, and still more wonderful development of our resources than we have ever witnessed in the past. This new era is bringing to us new responsibilities as citizens. The days of before the war have gone and along with them has gone our former conception of citizenship. Our new conception is broader and greater than that which we have held in the past. We are a part of a greater nation and a greater state, called to the service of what will become a greater world and a greater people of the world. We should give full recognition to these changed conditions. We should also recognize that this new era will call for greater cooperation than ever before in the past. It means not only service from the individual but a better and more cooperative service. We shall have to turn our attention somewhat from our individual ambitions to grasp the greater opportunities of cooperative efforts. We shall be obliged to call upon both State and Nation for new activities in many lines. Some questions have become so great that private enterprise and private associations can no longer solve them.

For many years we have had here in Wisconsin, as well as in other states, the question of farm marketing. We have realized that the old system was wasteful of time, effort and money. We have tried to reform and rebuild as best we could. Now we are calling upon our legislature at this session to fulfill one of its pledges to the people by providing for some new board or commission which will undertake a deep study of the marketing problem and work out a plan whereby some of this great waste between the producer and consumer may be eliminated. It must not be expected, however, that even our State will be able to solve all the difficulties at once. Only by a study of conditions and the discovery of new methods will we gradually work out a new and better system. I believe that a new impetus will be given Wisconsin horticulture under a newer and better system of marketing.

This new era will also call for a more whole-hearted response upon the part of every citizen to the demands of our State and Nation. There is always much to be said about the rights of

humanity, the rights of the individual, the rights of the citizen, under this government. More than ever before we shall have to recognize that along those rights there devolves upon us a duty. In fact, for every right which guarantees to us our liberty and our prosperity—our opportunity in life—we owe a duty to our fellow citizens, that their liberty, prosperity and opportunity may be enlarged.

While we gather here in meetings such as this to promote the purposes in which we are most directly interested, we should not lose sight of our broad responsibility as citizens, and we should resolve that while we are so vitally interested in the accomplishment of our individual aims, we shall at all times be ready to respond to that great call of service, and shall in every way possible come up to that high standard of citizenship upon which we can place guaranties for the future.

DO WE NEED MORE YOUNG MEN IN COMMERCIAL GARDENING? HOW SHALL THEY BEGIN?

IRVING SMITH

This question of need is sometimes a very difficult one to answer.

The New Standard Dictionary defines need as "a lack of something necessary or very desirable"—"deprivation, especially of the necessaries of life".

For the purposes of this discussion, let us assume that fresh vegetables are not only very desirable, but one of the necessaries of life. That point granted, the first point to be determined is, whether there is a reasonable supply of vegetables available for our people who want them.

This past summer we had a visit from a man and wife who moved from Ashland to a suburb of Chicago about two years previously. In talking over conditions and differences between the two places, they spoke especially of the vegetables and said it was hard to get good vegetables and that when they were to be had, the prices were almost prohibitive. These people are reliable people and used to buying vegetables. So it would seem that even the great distributing center, Chicago, is not always well supplied.

A few years ago Mrs. Smith and I took a trip to Florida. At the town where we stopped longest there was just one man growing vegetables. I visited his place, expecting to see something quite fine, and was sorely disappointed. Nothing on the place of perhaps one-half to three-fourths of an acre was really nice, and most of his crops were very poor. The result was a meager supply. Our friends could get something about twice a week.

When my father started commercial gardening in 1865 at Green Bay there were very few vegetables grown there. As things in town developed, the garden developed and with it the market.

Now, as many of you know, Green Bay is one of the large gardening centers of the state, but the market grows with the gardens.

Eleven years ago last July we moved from Green Bay to Ashland. That first season we were so hungry for vegetables that we ate lettuce that was going to seed and scrub cucumbers that were getting ripe, a few onions, which of course are good at most any stage of development. Most fresh vegetables were not to be had. For fresh fruit we ate blueberries and wild raspberries.

In 1909 we started a very little gardening and sold $87 worth of vegetables. The business has grown until in 1917 the garden sales were nearly $3,700. The figures on 1918 are not yet all compiled, but they will show a very substantial increase over 1917.

About the second or third year after we started selling vegetables in Ashland, one of our best retail customers wrote at the closing settlement for the season: "The vegetables have been very delicious. It is the first time since we came to Ashland that we have been able to get good vegetables." Since that time, I think it within the facts to say, over a hundred people have expressed to me some similar statement.

During the past two or three years, I have sold some goods to the summer tourists on Madeline Island, and was somewhat surprised to find that many of those people cannot get vegetables as they want them. In some cases the more forehanded ones order several days ahead. This, of course, makes the dealer set aside for his advance orders; with the result that those who simply go to buy for the day, have to do without or take anything they can get.

When the war garden scheme started some people said to me: "I suppose you will be sorry to see this come and take your trade." So far from being sorry I was glad and did all I could to help it along. Why? Because by using vegetables we are better off, and from a commercial viewpoint, people get in the habit of using vegetables and never stop if they can get them.

My trade has never been so ready to buy as during the last two years.

Of course there are dull times in trade when every dooryard garden has a row of onions and radish and lettuce ready to eat, but after they have eaten it, they are not content to do without.

This goes to show that fresh vegetables are a necessary food. It also shows that having a supply for a time creates a future demand. We all know that after one has had fresh vegetables for a time there is a definite *need* felt if they are not to be had.

Even our friends at Oshkosh are making more and more gardens and yet the market grows.

It is true that occasionally there seems to be an over stock of some one particular thing. This is not due to too many gardens, but to the unexplained fact that once in a while there seems to be a stampede to the growing of some one thing and then a big crop with the buyers frightened, causes a slump in price and demand. Such times come in all lines of work. Then there is the glass gardening which is rapidly growing, as is also the demand for winter vegetables. In speaking of the coal regulations in regard to the greenhouse, to one of my friends, I remarked that the government is trying to keep to the necessaries as far as possible. Quickly came the reply: "But winter vegetables are necessary."

Not long after we moved to Ashland, I was speaking of the fact that we had contemplated going to Waukesha. My friend, who has traveled much about the state said, "Waukesha would have been a fine place to go into the garden business, you could have done well there."

It seems needless to go farther on this line to show that there is a need for more gardens in many sections of the country.

Having shown that we do need more young men in commercial gardening, the next point is "How shall they begin?"

First: You must like that particular kind if work. A man does not often make a real success of any line of work that he does not enjoy.

People often ask me: "How do you manage to make your plants grow so fine?" or "What sort of a secret process do you have to keep things doing so well?" If the questioner is a woman, that I know, I quite often say: "Just love them a little and let them grow." Sometimes it is hard to make a man believe that I use the same kind of seed and fertilizer, etc., as he may have, and have no secret method of planting or treating as if by the magic wand to assure success. You simply must *know*.

It is quite unusual for a man who really loves a garden to fail of success in having a good one. On the other hand it is quite

unusual for one who does not love a garden to have much better than a scramble of second or third rate vegetables mixed with a crop of equally poor weeds.

I have one neighbor who has been trying to garden for several years, and seems to have a remarkable power or ability to do or not do something to spoil any crop they try to grow. I have told them how to build a hotbed, how to put the manure in, how much and what kind of soil to put on, how to plant, and how to care for it; not once, but over and over and yet they have never had a hotbed worthy the name. They manage to do or leave undone something to spoil it every year. They have tried to raise turkeys and something comes to take them. They are good, honest hard working, earnest, Christian people. But have not the love for growing things which carries with it success.

Do not misunderstand me at this point. We are trying to point out the ideal conditions. One may *learn* to do something that is definitely distasteful to him. Or he may learn to love a work that was first unpleasant. When we come to realize that cultivating the soil and growing things is something more than a job or business, we are coming to realize the honor bestowed on man when God placed Adam in a garden to dress and keep it. We, as Adam, have the opportunity of working with life, and so, with God.

You may buy and sell, you may help to distribute goods, or even the vegetables and fruit some others may grow. You may do a big business and gain wealth, but you have produced nothing. The soil produces the wealth. Without the products of the soil, all else would be in vain and useless, because it cannot sustain life.

God has laid down certain laws governing life and its development. It is the work of the gardener to learn and apply as many of these laws as possible.

A man should begin by loving the work. If he loves it he will strive to know the laws governing its proper development. How shall he learn these laws? Take the agricultural course at the University and major in the particular line he wishes to pursue. Yes, but very few of us have that opportunity . Then go to the best gardener you know and hire out to him for a year and learn all you can of methods and reasons why. Tell your employer what you want and ask to be allowed to do as many different

kinds of work as possible. By the end of the first year you will have gotten considerable of an idea of what that particular man considers good practice.

If you have some other means of getting a living than your garden it might be advisable to start in for yourself the second year. I should consider it a very doubtful proposition, however, in most cases. Better work a second year before you try your hand alone.

Remember, we are talking about young men; not old experienced farmers. I have said you should like the job. Let us see what it includes under the average conditions.

First: He should have a full supply of good common sense. This should apply to a lot of things. He should be able to see why any certain practice is right or wrong. He should have some mechanical genius in the use of tools—a gardener often has to make some tool needed or to make repairs, or to put up a rough building

Now, assuming that you can plow, harrow, and rake the soil preparatory to planting, then do a good job with a garden seeder and the various forms of hand and horse cultivators, saw a board, drive a nail, put on shingles or prepared roofiing, lay a cement floor and other kindred work, we are ready to see about a place to display your skill and make your fortune.

What are the desired specifications? The first is a market. Seek a place where there is a good prospect of growth. If you expect to do a shipping business there must of course be good means of transportation and not too far from your market. Remember that fresh early vegetables are shipped *north* almost entirely, while the later crops may go south.

Choose a soil that is easily worked, fairly level, and with water available. Avoid a hollow or you will get damaging frosts early and late.

As to equipment. Get only the necessary tools to start with and fill in as you find you need. It will take three to five years to get a full outfit if you take a new place.

If you have the cash, you may buy out some retiring gardener, or some one with the California fever and so get a place all in running order, with an established business.

Start with standard varieties. Confine your experiments to single package quantities, so that the loss of the desired crop will

not be a serious one. Buy seeds only of reliable parties. Let the price of the seed be the last consideration. Choose what you consider the best for your purpose and pay what is necessary. Do not use cheap substitutes.

In buying seeders, cultivators, etc., avoid the combination tools. I have yet to see the combined seeder and cultivator that was not the loser by the combination. In buying tools, get what is necessary to do work well and economically. Tools are cheaper than men.

Avoid planting more crops than you can care for properly.

What are the chances of financial success? *Good.* Remember that there is always plenty of room on top. Make your neighbors look up to you for advice and example and there is little danger of business failure. Gardening is no get-rich-quick proposition, any more than is general farming. Yet, one only has to look about a little to see that gardeners as well as farmers get along in a business way and have something to care for themselves in old age, and a living the best the land affords during life.

There is a great deal more that might be said along these lines, but a full program will not permit. I think enough has been said to show that gardening is not a thing of the past, or a job for a few stupids who don't know enough for anything else. On the other hand, it is a work for the keen, intelligent, educated, man who has the ability and vision to go into it right.

TRUCK FARMING ON TEN ACRES

J. W. ROE

I am asked to make some suggestions as to what a young man should grow, starting on a tract of ten acres which is to be devoted to vegetables and fruit. I imagine our secretary means for me to talk about making a home and a living from a tract of ten acres.

This is being done by thousands throughout the country. Wisconsin offers as great inducements to the truck gardeners and small fruit grower as any of the states. I am satisfied that Wisconsin offers a safer bet for the small truckers than does Florida, Texas, California or any of the much advertised and alluring green pastures of the south and west.

Here, should the main crops fail, a catch crop of some kind will go far toward keeping the wolf from the door. A market is near by and will take anything from a dozen of eggs to a bunch of green onions.

The young man who is going to take up Horticulture with the object of making a living for himself and family must have a lot of work in him, must use his brains, and, above all, must have a natural liking for growing things. Wisconsin has much to offer to the horticulturist in the way of variety. Its changing seasons and abundant rainfalls have covered its surface with a verdure pleasing to the eye. "A land that will clothe itself will clothe man." So the young man need not be afraid to trust to Wisconsin soil. If he is going to make a success of such a venture he should be a lover of nature. However, not all lovers of nature make successful truck growers. There are those who see the mountains, the sky, the mirrored lakes and streams, the forests and woodlots, but whose perspective is so broad they fail to see the little things close by. There are those who see the individuality of plant life and study to learn their habits and to make use of such plants as man may require. They study ways and means to perfect a plant or a fruit so that it will become a source of gain to humanity. This is practical horticulture.

The beginner should have some practical knowledge of horticulture unless he has money to hire some one to guide him over the rough places. In either case I would advise going in gradually, letting his operations be guided, in extent, somewhat by his knowledge of the business.

There are so many conditions entering into this proposition that to lay down a line of action without taking under consideration any especial case might lead to disastrous consequences if followed blindly. So if I can be of any practical use in the short time allotted me I must deal out some general observations and let the young man, starting in on this home buiding, figure out his own salvation. The location of the land would decide to some extent what crops best to be cultivated. For instance, if it is near a large city, general truck gardening in connection with hot beds, winter storage, and possibly greenhouses would probably pay better than other lines.

Where the distance from town is greater, specialized crops are handled to better advantage as marketing can be done at one time. Much depends on the character of the soil to decide what crops can be grown to advantage. If the soil lies high and is of heavy clay, onions or celery would be unlikely crops to raise, nor would melons do well on such soil. It would be better to go in for berries and some tree fruit than to attempt vegetable gardening. However, at least one-half of the ten acre tract should be kept in field crops to furnish feed for the domestic animals; namely, two cows, a team of horses, some chickens and a brood sow. You may ask, Why all the live stock? The land will need all the fertilizer that can be produced at home.

Intensive cropping takes the fertility from the soil rapidly. This, of course, has to be returned. Then the supply of milk, cream and butter, furnished by the cows, together with the meat raised on the skim milk, furnish the family with a considerable part of their food. Possibly gasoline power could be substituted for the team of horses and cows might be added in their place. Pigs and chickens eat up the waste and are quite a necessary adjunct.

Another reason for keeping part of the land in growing field crops, such as clover, alfalfa, peas, etc., is that these crops bring nitrogen into the soil and also humus. At the same time they are resting the land with rotation of crops. Rotation of this kind is

necessary for such crops as strawberries, tomatoes, potatoes, corn, etc.

In regard to specializing on certain crops I have found through observation, that those who are doing this are, as a rule, getting ahead. It seems that more expert efforts are likely to be exercised on a specialized crop than can be handed to a haphazard garden. It is much like a department store compared with a straight one-lined place of business. The man running a department store must be a wizard to hold up the many lines to the standard of a one-lined store. Generally men are not wizards.

The question of selecting lines on which to specialize depends on the soil, climate, market and the available labor supply. Owing to the perversity of our growing season, no man can figure on a sure thing. However, there are at least two kinds of summers to bank on—the hot and dry and the cool and wet seasons. Figuring on either a hot, dry or cool season, some of our best growers try to play a sure game and bet both ways. In other words, they specialize on two kinds of crops, one requiring cool weather and the other requiring a hot summer. In doing this one crop ought to be a winner, while the other may not lose out altogether.

To illustrate the crops I mean that require a cool season I will name some of them—cauliflower, celery, cabbage, peas, root crops and grains, cucumbers and potatoes. On the other hand, tomatoes, onions, melons, corn, beans, peppers and egg plant thrive in hot weather. Too little moisture sometimes shortens the crop, but it seldom happens in Wisconsin that total failure comes through drought. But we are likely to have periods of excessive wet, when, if it were not for drainage, a total loss may ensue. Consequently the problem of drainage enters into the question of how much to plant. I believe it is unsafe to put much into intensive cultivation unless the soil is tiled.

In regard to the cultivation of fruit I would confine the growing of fruit to small fruit. For all kinds of soils strawberries and red raspberries are usually the safest crops. Currants and gooseberries come in all right unless local home gardens have created an over-production. Black caps and blackberries are partial to light soils and are more or less unreliable. As to fruit trees, I believe a ten-acre farm is too small to attempt much in that line and would advise planting for home use only.

Some of our truck gardeners are specializing in onions and cabbage, others in tomatoes and cucumbers, or muskmelons and cauliflower. Usually an acre of strawberries is added. They seldom confine themselves to certain crops; but generally it is better to have some specialty.

To illustrate as to the proportion of land allotted to the different crops that a truck gardener, sending a wagon to the city frequently, might consider, I will give the following outline:

Asparagus bed, permanently located, one-half acre.

Early leaf lettuce, spinach, head lettuce, early beets, carrots and set onions, one-half acre.

This land to be used again for celery, head lettuce, spinach and winter radishes.

Dwarf green peas and early wax beans, planted in drills, one acre. This land to be planted to early bantam sweet corn and pie pumpkins as soon as the peas and beans show their second leaves. The peas and beans will get out of the way of the corn and will help the corn if anything by drawing nitrogen to the soil.

Black seed onions, one-half acre.

Beets, carrots and parsnips, one-half acre.

Cow beets for stock and chickens, one-fourth acre.

Peppers, cauliflower and egg plant, one-fourth acre.

Muskmelons and cucumbers, one-half acre.

Tomatoes, cabbage, early and late, berries, each one-half acre.

The tomato, melon and cucumber and late cabbage land to be seeded broadcast to early round red radishes and also to cabbage seed for plants. The radishes divided in three sowings, a week apart. Early cabbage ground to be followed with spinach and leaf lettuce. Round radishes to be seeded any time a space is available up to the middle of September.

One-half acre of strawberries to be set out each spring and old patch plowed under after picking. This ground to be seeded to late table beets, turnips and spinach.

Vegetables and flowering plants and hardy perennial plants are often included in the gardener's list of marketable crops.

The hotbeds are to be used both in the spring and fall for forcing lettuce, radishes, etc.

The stover from peas, beans and sweet corn will furnish stock feed, consequently some of the grass land will not be needed so much for hay, but can be put under cultivation, and more fruit

and potatoes may be raised; also a few rows of Hubbard squash. The soil should be tile-drained and be of a loose texture so that it may be worked at any time.

A Florida real estate man was bragging how they start picking strawberries down there at Christmas time, and in three months gather five hundred dollars worth of berries from an acre. A quick answer from a Wisconsin man came, "Why, we can get that much off an acre of berries in three weeks and have two months to go fishing on you fellows if we want to."

We will welcome into the good fellowship of the Horticulture Society anyone who wishes to join our ranks. It does not make any difference where you go or what you grow, there are the long hours, the close figuring and an element of chance to contend with. "Our life is a compromise sometimes fair, sometimes overcast; tempestuous and serene. As in a rose, flowers and prickles. A temperate summer sometimes, a hard winter, a drouth, and then again pleasant showers. So is our life intermixed with joy, hopes and fears."

TOMATOES FOR MARKET; VARIETIES AND CULTURE

J. F. HAUSER.

Seeds for the main crop should be sown about the first or 15th of March, in hotbeds. Some people sow them broadcast; I prefer to sow them in rows. Make your rows three or four inches apart, that gives you a chance to go through them with a hand weeder and get rid of the weeds and I also think that the cultivation, especially after watering, prevents the damping off of the plants. When they get the first leaves they should be shifted to either another hotbed, or to a cooler place, a cold frame. If you have a greenhouse you could shift them to a flat or to pots, but anyway, transplant, or shift them before you put them out in the field. I think that is very essential with most plants, and especially so in tomatoes. It certainly pays and pays big. If you shift them twice you will not hurt them any. You get a stronger stalk to your plant, you get a much better root system,

they will grow much more rapidly when you put them out in the field, they are not so likely to be the victims of driving storms, in fact, you get an altogether different sort of bearing plants if you treat a tomato in this way, by shifting them in the frames or in the greenhouse. If you have a choice of soil, plant them on warm, sandy loam, a warm south slope, but if you have not these conditions, plant them anyway. I do not think there is a garden in Wisconsin that will not produce tomatoes. According to variety, plant them about three or four feet both ways. I prefer to have the rows far apart, so as to cultivate the tomato quite late. I find that the later settings of tomatoes will be very near as good as the first ones, if you give them quite late cultivation.

Now as to varieties, I am not going to recommend any varieties. The number of varieties of tomatoes is so great, and we differ so much on tomatoes, more than we do on the growing of apples, possibly, that I am not going to recommend any particular variety. But I do recommend that where you have a variety that has done well in your locality, stick to that variety, and select your own seeds.

I do not recommend that we should grow all our vegetable seeds. I do not think it is necessary to grow all the vegetable seeds, but there are two things of which we should grow our own seed and that is sweet corn and tomatoes. Those are two of the things I know we should grow.

Now, in selecting your specimens for seed, by all means consider the plant as well as the fruit. I think that the selection of seed in tomatoes is followed along about the same line and the same methods are used as in selecting potatoes. Rather than to select an individual tomato, select the seed from a strong, vigorous plant that grows all nice, uniform medium sized fruit. You might select the seed of a nice, big tomato and if that plant should happen to have quite a lot of small, rough stuff growing with it, the seed is going to be as that plant was and not as that individual tomato. I think we all make a mistake in selecting tomatoes by not considering and selecting the plant as well.

Now, there is another thing I know I will get in bad with some of the members here, that I am not in favor of, and that is this fad of growing tomatoes on sticks. I do not believe in

that. It may work out all right where you have very little space in a city garden, where you have got to train them up instead of spreading on the ground, but if you have room where a tomato can spread out, let it spread out as Nature intended him to grow. I have never eaten a tomato yet that was picked on a naked, pruned-off stalk that was of the quality of the tomato that grows right down on the ground, in among the foliage. A tomato is a vegetable. Some people claim it is a fruit. If it was a fruit I suppose it would be improved by such training, but as it is a vegetable, it is like a potato that is sunburned, and I am surprised there are so many people still preaching and teaching growing tomatoes on a stick.

DR. EVERETT: How about pruning the plant?

MR. HAUSER: Why, I never prune a tomato plant much. Once in a while late in the fall, when the foliage is very dense, and it is getting where we expect frost soon, I cut the tops off a little, but otherwise I leave them grow as God intended they should grow.

THE PRESIDENT: If you have about three feet square for two or three tomato plants, on a city lot, would you train them or spread them?

MR. HAUSER: I think you would get just as many tomatoes if you had four square feet growing in the natural way, as growing a lot of grapevines.

PRUNING AND SPRAYING BUSH FRUITS

T. H. KIETHLY, Indiana.

The systematic pruning of the bush fruit, especially of currants and gooseberries is very often neglected, yet it is just as important that they be pruned regularly and to some fixed system as it is that the grape, for instance, be so treated.

One should have some definite system of pruning each species of bush fruit and the choice of system must depend upon certain conditions, such as the fruiting habit of the plants, the manner of training, the location of the plantation, the variety one is growing, etc. No system, however practical it may be,

can be applied in an ironclad way to all varieties of a class nor to all bushes of a certain variety but must be intelligently varied to meet the case in hand. I shall tell briefly of some of the systems we have found practical in our work.

The pruning of currants and gooseberries can all be done at one time in late winter or early spring. They both produce most of their fruit on the laterals on canes older than one year and on fruit spurs on these canes, hence the same system of pruning applies to them both. We first remove all canes over four years of age. Then head in all lateral shoots that have made a vigorous growth. We take off two to four inches from a growth of ten to twelve inches. We rarely head in any laterals on the four year canes. We then remove all but three or four of the one year canes or whips and head them back to about 2 feet in height. This makes for a short bushy cane that will not drop over when laden with fruit. Lastly we go around the bush and trim off any growths that trail down. When the bush is pruned it has three or four canes one year old, three or four two years old, three or four three years old and three or four four years old but none over four years of age. Occasionally this system has to be varied to meet the varying conditions of seasons, etc., but always we have new wood coming on and old wood being taken out.

The raspberries all produce their fruit on one year canes that bear only once and die that autumn. Each spring one or more leafy shoots arise from the crown of each black raspberry bush. These we tip back or pinch out the growing tip from two to two and a half feet high. If allowed to grow tall and then cut back to this height a weak lateral growth results but when nipped at the right stage several strong laterals will be thrown out and will greatly increase the fruiting surface. One often has to go over the black caps three or four times to get these shoots at the proper height. Before growth starts in the spring we prune the lateral growths of the young canes to from eight to fourteen inches in length and then with a pruning hook remove all the dead canes that bore the past season's crop of fruit and enough of the weaker young canes so that no bud has more than four or five canes in it. When we transplant black raspberries we trim off all the old wood as near to the bud as possible so as not to spread disease.

The blackberry should be pruned about as I have outlined for the black raspberry except where supports are used for the canes the shoots need not be nipped in the summer.

The shoots of the ordinary red raspberry should not be nipped in the summer, but if one is dealing with the drooping purple canes, as Shaffer and Columbian, the nipping should be done the same as for black caps. The young canes of the red raspberry should be headed in in the spring before growth starts at from three to four feet. All old dead canes and weak young ones should be removed at the same time.

Now as to the spraying, all bush fruits should receive a good thorough coating of winter strength lime sulphur applied late in the spring just as the leaf buds are bursting open. Even if some of the leaves are commencing to unfold we have never noticed any spray injury. The later it can be applied without injury the more good it does. We have found that this winter spray controls the anthracnose of the black raspberry better than any other thing we have tried. It also holds the San Jose scale in check on the currants and saves as a general clean up for many fungous troubles. When the leaves on the currant and gooseberries approach a quarter of a dollar in size we spray with arsenate of lead for the currant worms, and repeat in about ten days. This gets them before they get a start and they rarely bother us. If you wait till you see them to spray for them you are apt to find them about as hard to stop as a forest fire. Before the war caused copper sulphate to soar in price we always combined Bordeaux with arsenate of lead for these summer sprayings of the currants and gooseberries and never had any serious loss from leaf blight or from gooseberry mildew. Two years ago we decided because of the high price of copper sulphate to use summer strength lime sulphur, one gal. to 40, with the arsenate instead of the Bordeaux. So far the past two years we used no Bordeaux. This we have found to be a false economy and as direct result we had to grub out as fine a patch of Red Cross currants as one would care to see. They had been ruined by leaf blight. In our opinion had we stuck to Bordeaux we would still have those bushes. In some localities the currant louse or aphis gives trouble. The best spray for this is nicotine sulphate and can be applied as a combined spray or separately. These lice work

on the under surface of the leaves and as the spray must hit them in order to kill, one must use an angle nozzle. Fortunately we have never had a bad infestation of these aphids although we have had enough to see what damage they could do if they appeared in numbers.

It looks now as though the market would be very keen for all kinds of berries for the next few years and I believe we will all be well repaid for extra effort in spraying and pruning these crops.

DISCUSSION.

MR. MOYLE: You spoke of an attempt to grow gooseberries; what variety did you grow?

MR. KEITHLEY: We had a patch of 600 Downings until this fall when we took them out and arranged the ground for vegetable crops. We never had as profitable a crop of Downings as this year. We also have a patch now of an English Gooseberry, I do not know the name of it. By the way, it was an English gooseberry brought over from Germany, I do not know but what we ought to discard it, but it is a good gooseberry and we kept it. It is like a good many citizens of German blood, they are proving good citizens and we are going to keep them. This gooseberry is as large as the Downing and it does not blight.

MR. MOYLE: I have grown the Downing and the Houghton and Champion and I cannot see why anybody wants to grow the Downing if they can grow the Champion, because the Downing as we have it is decidedly flat growing, and is terribly spikey and is difficult to pick. The Champion is large, it grows upright, easy to gather and all nurserymen are putting it in their lists. I do not see why they still insist on growing the Downing.

MR. KEITHLEY: There is a great variation in the Downing. For instance, in our patch of Downing gooseberries I can go in and pick out a bush that I could swear has not grown a profitable crop for years and take the next bush, it has grown regularly a good crop every year. I think if somebody would propagate these good bearing gooseberries, we would get a better berry.

MR. CHRISTIANSON: I should like to ask the difference between the Carey and the Houghton.

MR. MOYLE: The Carey is a cross between a cultivated variety and the common wild gooseberry. The gooseberries on the Carey hang three in a cluster, that is characteristic of the wild gooseberry. My father grew the Houghton before I was born. The nurserymen are booming the Carey for all it is worth, but they still have the Houghton. There must be some reason for it.

MR. KIETHLEY: When I was younger than I am now, within a quarter of a mile of our house, I think there were 40 acres of black raspberries that were all Olders. I watched them gradually decrease to nothing and the main fact forcing people out of black raspberries was anthracnose. I can show you at home where rows about 150 feet long of Olders were put out ten years ago that are in good growing condition and show no anthracnose, comparatively speaking. The fact that other people tried that variety right around there, the unsprayed have died off and others that have been thoroughly sprayed continued to grow, it seems to me is proof. A short time ago I heard from the Michigan station, where they have made systematic experiments along that line. You will find that they have tested out the control of anthracnose on raspberries on a large scale. They have found that in addition to this winter spray with lime sulphur, that it was very beneficial to give a couple of summer sprays of lime sulphur. I do not recall the exact details, but if you write to the Michigan station, you will get some accurate information on the subject.

MR. TOOLE: I should like to ask Dr. Fracker what is going to be the outcome in the contest between the white pine and the currant gooseberry.

DR. FRACKER: The presence of the pine will not endanger the gooseberries in any way, the presence of the pine does not affect the value of the crop and the question has to be viewed in the light of the particular locality in which the disease exists. That depends on the commercial value of the pine as compared with the currant and gooseberry. For example, in the Niagara peninsula in Ontario, west of Buffalo, there is no attempt being made to take out the currant and gooseberries in order to save the pines, because the currants and gooseberries are much more

valuable than the pines, while in certain sections of Wisconsin the reverse is true. The pines, being a commercial crop, we may call it there, is of great value and the currants and gooseberries being no factor at all from the commercial standpoint, in that region. In the region about Baraboo, in which Mr. Toole I presume is especially interested, I do not think he need fear that the currants and gooseberries will be disturbed in order to protect the pines that are standing in that part of the state.

MR. CHRISTIANSON: I should like to ask Mr. Kiethley on what kind of soil he grew his raspberries.

MR. KEITHLEY: Our soil is clay loam. I might add that there may be one other feature of controlling anthracnose, and that is that we generally mulch those rows each year; mulching may have had as much effect as spraying, mulching with manure.

STRAWBERRY ROUND TABLE

THE PRESIDENT: I should like to discuss the strawberry situation as at present it exists. We have not in the state more than 25 per cent of the acreage we had five years ago. Where are the strawberries coming from and where are they going and what is the reason? What will be our best varieties and methods of cultivation? If you were to plant an acre of strawberries for commercial use, on what kind of soil and what varieties would you plant, Mr. Christiansen?

MR. CHRISTIANSEN: If I had my choice I would take sandy loam, but I have not, so I have to plant on a clay loam and for varieties I would take the Senator Dunlap if I had to use one. We grow the Bubach, of course that has a large plant and a good stalk, but if I had to select one variety, I would plant Senator Dunlap and possibly some Warfield. The reasons for cutting down acres, or the reason for the poor prospect of strawberries for next year I think is largely due to the unfavorable winter that we had last year, that killed so many plants. The

plants were not killed off, but were so nearly dead that when they were set out they nearly died. That accounts somewhat for the small acreage of new settings last year.

THE PRESIDENT: What are your conditions as to soil, Mr. Smith?

MR. SMITH: Our soil is clay and the reason I stopped growing strawberries is because of the robins. I think more of the robins than I do of the commercial strawberries, and so I gave up. They come there simply by the thousands and you might as well have the hennery turned loose in the strawberry beds as the robins. With one exception they have eaten a great deal more than my profits every year and so I set out a little bed right back of the house where I hope I may be able to get enough for the family and no more than the robins would want. I may sell a few.

THE PRESIDENT: What varieties?

MR. SMITH: Dunlap and Sample we consider the best varieties. If I could have but one, I would have the Dunlap, because I cannot grow the Sample alone. It does very well in connection with the Dunlap, very well indeed, it has for a number of years. I have had quite a number of other varieties, but cut down to those two.

THE PRESIDENT: At Richland Center, Mr. Blackman, what are the conditions there?

MR. BLACKMAN: I do not know of any large acreage, I have about an acre myself. My soil is a clay loam. As to varieties, I grow Bubach, Dr. Burrill, which is almost identical with the Dunlap, Johnson, Kokomo and Gibson. I rather like three or four varieties, as some years I think if growing just one or two varieties, that one of them might fail. The Johnson is a late berry and is a very good one and fills the bill for a late berry.

MR. PRESIDENT: I used to grow several varieties and if I were to go just by the fruit, I would plant one variety, the Dunlap. I believe, as a lawyer said, put all your money in one bank and watch that bank. I put in that one variety and watch that variety.

MR. BLACKMAN: I think the Bubach and the Kokomo have made more money than the Dunlap ever did.

THE PRESIDENT: I wonder if Mr. Christiansen has found the same in our market as I did, not as ready for the Bubach as

three or four years ago. They are going to demand more of the darker berry.

MR. CHRISTIANSEN: They want the darker berry, but the Burbach is still sought as a table berry. It requires less sugar and I think as a fresh berry it is more in demand, but for a canning berry the Senator Dunlap is better.

QUESTION: I should like to ask about Minnesota No. 3; has any one tried that?

A MEMBER: I bought 25 plants last year and they made such a nice growth that I thought I got something that was really wonderful. The 25 plants fruited this past season and they did not in any way compare with the Dunlap. The fruit was nice, but nothing like as many or as large a berry, only now and then one equaling the Dunlap in size. Of the Dr. Burrill I had that also and I did not find it equal to the Dunlap this year, although I think it is a nice looking berry.

MR. MOYLE: I have tried the Minnesota No. 3 two years. The first year I could not tell much about it. This year we fruited several hundred plants and it is a more rank and vigorous grower than the Kokomo. That is where you see the Dunlap blood, it has more vitality, spreads more, makes more plants, but I confess it did not set as many berries as it ought to, maybe due to the fact that I left mine in the matted row. It is going to be a good plant maker anyway, so we nurserymen will probably boom it.

MR. TURNBULL: If you were to set out a small garden patch, would you advise setting out the Dunlap alone?

MR. MOYLE: I notice where they plant it with other varieties, the Dunlap does a great deal better. Everybody swears by the Dunlap, but just the same the Dunlap if alone will be shy when it comes to bearing, when the conditions are not right. The Dunlap is a soft berry. If the conditions are not right they are as soft as any. If you want a firm berry, you want to take the Gandy for a late berry.

THE PRESIDENT: I wonder how many men there are here that plant with a machine? I believe that is one of the reasons that there has been so little commercial planting. When we are short of help we do not give more acreage to strawberries than we can take care of by hand. If we get a machine into a neighborhood—they are not high priced, cost maybe $50—a cab-

bage planting machine will set strawberry plants just as well as cabbage and tomatoes, better than you can do it by hand and in less than one-fourth the time and it is a pleasure instead of hard work.

MR. MOYLE: That is a remarkably broad statement. We have had cabbage planting machines down in our neck of the woods and we have all done away with them. You cannot get your team to go slow enough to get the roots in straight.

THE PRESIDENT: I first saw this work done at Ft. Atkinson six acres planted by machine. I was wondering how it would work and I have never set strawberries any other way and I never shall. You have got to be alive and on the job putting in the plants, but you only want them 18 to 20 inches apart and there are two to set those plants.

MR. BLACKMAN: I have had some experience with planting strawberries with a planter. There are two things you have got to have, one, you have got to have a team that will walk slow; another thing, you have got to have the ground well prepared. Roll your ground, pack it thoroughly, go through with your strawberry planter, go very slowly and it will be successful. That is the only way to plant strawberries. You want your ground packed down hard.

MR. BEDELL: I should like to ask the successful strawberry growers how many years they pick from the same patch?

THE PRESIDENT: We fruit one year in most cases and since we have been doing that, we have no leaf roller, for one thing and it is much easier to get them picked, and I think we get more money, enough to pay the difference of planting each year, although if the bed is in really good condition we leave them another year.

QUESTION: I should like to know whether most of you here think the Progressive strawberry is worthy of a place in the home garden, compared with the standard varieties such as the Dunlap or Warfield.

MR. WILLIAMS: They are to anybody that will give them the care. You cannot grow them and give them the same care as the other varieties. They need cultivation.

THE PRESIDENT: How many growers practice spraying?

A MEMBER: We sprayed this year for those little hoppers that kill our early potatoes. They were right near the potatoes

and the hoppers went over into the strawberries. I sprayed the strawberries with lime sulphur. It worked all right, we thought.

THE PRESIDENT: I have given them at least one soaking of Bordeaux mixture and that proved a great benefit.

MR. KEITHLEY: We have sprayed with Bordeaux until we thought we could not account of the high cost, and then used lime sulphur and we thought that was satisfactory. We also found by putting arsenate of lead in the spray early, that we had a great deal less trouble with the leaf roller. We generally spray when we get time.

RASPBERRIES.

MR. NELSON: I have raised raspberries for over twenty years. To start with, I like to have the land clear of weeds. We raise quite a lot of sweet corn and we plough the sod, then plant sweet corn and then the next year, with the land good and clear and plenty of humus in the soil, it would be ready for raspberries.

The first year I mark the ground both ways for corn or potatoes, whichever I am going to have, mark it three feet and row it both ways and I plant my berries about the same time as the sweet corn. I have planted corn as early as the 20th of April. That is about the time we should plant our raspberries, just before they leaf out. We get the whole field ready and I plant my corn first and leave every other row for my raspberries. When I have my sweet corn all planted, I have my berry plants all dug, heeled in and I would have a boy drop my plants right in the marks between the corn and when the corn comes up, my berries will be ready to cultivate both ways. I would cultivate both ways all summer. Then the year after I would have them rowed both ways so as not to have any hoeing. The year after I would row them one way; I would have them all cultivated one way. Along in the fall of the second year I mulch them with barnyard manure, and in this way it does not take any hoeing. I always mulch to have my ground good and clean and I never have any weeds in that way and I have a good start for the raspberries.

Now, does any one want to know how I plant them? I have a ditching spade, a regular 4-inch spade. I find it rather long, so I cut off about three inches. I have the boy drop the plants. Years ago I used to plant potatoes, when I was a boy, and I used a spade. When I got to raspberries I decided to plant the rasp-

berries that way and I found I never had any trouble with raspberries dying. I simply get them down deep enough, so when I come along with a cultivator the roots are in so deep that there is no danger of pulling them out.

THE PRESIDENT: What varieties?

MR. NELSON: I generally raise the Cuthberts and the Marlboro. We pick our berries every day. This year we had over a month raspberry picking. We commenced the first of July and we were picking berries as late as the 5th of August.

MARKET GARDENING

FRANK GIBBS, St. Paul, Minnesota.

Market gardening has never been an aristocratic profession. Nevertheless more food can be produced in less time on a market garden than in any other branch of agriculture.

The market gardener is facing now more problems than he ever faced before; chief of all is the fertilizer problem. Horses have been replaced by trucks and autos to such an extent that very little stable manure is to be had.

Commercial fertilizers, at the prices asked for them, with the price of vegetables where they are, cannot be thought of, and we don't know much of anything about commercial fertilizers either. Market gardens are not large enough to keep stock enough to maintain the fertility of the soil.

How long will garden land produce vegetables without fertilizer before the fertility is gone? Not long. And when gone it takes several years to build it up again.

Farmers who keep stock will not think of devoting part of their acres to truck crops as the price of grain, stock and dairy products are much more profitable than vegetables at last summer's prices, or even at present prices.

The labor problem is still with us. The returning soldiers are entitled to the best jobs there are; and the best jobs are not on a market garden. The chances for the coming summer are that we can discharge an incompetent man and hire another incompetent man; that is, our labor will come from the ranks of men who

have been working in shops putting in eight hours' time and being pastmasters in the art of doing two hours' work in that time.

Last summer, all vegetables that were luxuries sold readily and at good prices; with staple vegetables it was different. Who can figure a profit when you pay a man $50.00 per month (boy in proportion) and sell Hubbard squash for $8.00 per ton delivered, Holland cabbage $8.00 and $10.00 per ton, onions 50 to 75 cents per 100 pounds, table beets, carrots and parsnips 30 to 40 cents per bushel? A man would have to produce a ton of squash or cabbage in three to four days, and board the hired man for nothing, to come out even. He would have to produce a bushel of onions, beets, carrots or parsnips every two hours to come out even.

The result of last year's experience is that the acreage in all truck crops will be greatly reduced. Who can blame the gardener?

The slogan urging people to "Eat more Vegetables" has not worked out to the advantage of the market gardener because I am informed less vegetables are being sold through the stores, or served at restaurants and hotels than in normal times before the war. An example of how enthusiastic the market gardeners are over their business, the St. Paul Gardeners' Association has about 300 members and at their annual meeting last month there were only 14 present.

Market gardening was, and is yet, a legitimate business and I have always been proud of being a market gardener. In some ways I wish that I had hired someone to kick me out of the business five or six years ago.

Three years ago we did as many other gardeners have done,—quit raising lettuce in the hot houses and raised flowering plants instead. This has always been a pleasant and profitable business. Last year when the "war clouds" were dark and uncertainty prevailed everywhere, everything in the flower line sold out at fair prices and the prospects for the coming season looked better than ever.

We now come to the greatest problem of all. What is the market gardener going to do? He has not a model stock farm, neither does he understand how to raise or care for stock. He has not a grain farm, but he has got a truck farm, fully equipped to produce vegetables cheaper than anyone else can produce

them. This being the case we had better stick to the business so that when conditions return to normal and vegetables sell at a good price we shall be in a position to reap a substantial reward for our labor and experience.

Then how shall we continue? If we all raise the luxuries, such as head lettuce, cauliflower, eggplant, endive, the market would soon be overstocked and there would be no market for them. If we all raise crops that require very little labor the same result would follow. The use of more machinery might help some but would not be a certainty. A man might be an expert hand weeder and be an entire failure with a Bruner or Vrooman weeder and he might be a very good hand with a wheel hoe, but let him try a garden tractor and he might tear up more stuff than his neck is worth, while another man who could not run a wheel hoe might do an excellent job with a garden tractor.

It seems to me the best method is to stick to the crops we are now growing and make what stable manure we can get go farther by cutting out all double cropping. Raise an early crop on part of our ground and plant a crop of field peas, buckwheat or any green crop to plow under, also plow under a green crop on another part in time to grow a late crop. I know you will say that is not adding any fertility but only returning what the land produced, but it is helping the mechanical condition so it will produce good crops with less manure, also helping clean out all noxious weeds so much labor is saved in that direction. By doing this we can still keep our fertility; then if we cannot produce enough to supply the consumers, more consumers will have to raise their own if they want fresh vegetables.

GROWING AND MARKETING PLANTS

H. C. CHRISTENSEN.

The growing of vegetable plants in greenhouses, hotbeds and cold frames for market may be made quite an additional source of income to the gardener, especially as most of the work connected with it may be done at a time when outdoor work does not claim one's attention.

The war gardens of the past two years have greatly increased the sale of plants and the demand has been almost unlimited, and as the interest in gardening has been stimulated by war work the demand will probably continue to be good for some time to come.

I believe it will pay one to have a small greenhouse to start plants in, as it eliminates much of the cold, disagreeable work connected with early hotbeds and as it is getting harder to secure materials for making hotbeds the cost of heating is not any greater.

A good supply of soil should be secured in the fall. If one has a greenhouse it is filled then, if hotbeds it is put in piles and covered with manure to prevent freezing. We like a clay loam that is prepared by plowing under a heavy sod in the fall, working it thoroughly through the spring and summer to reduce the sod and keep it free from weeds. To this is added one-third of well rotted manure and some sand if the soil is very heavy.

A good supply of flats will be needed if the plants are to be sold to the grocers or retailers. We use two sizes 16½"x22", 12"x16½" and 3" deep as these sizes fit conveniently in either a 3 ft. or a 3ft. 4 in. sash frame. A few pots and dirt bands will be needed as there is some demand for potted plants.

The plants that are mostly in demand are: celery, tomatoes, pepper, egg plant, cabbage, cauliflower, kohl-rabi and head lettuce. To these may be added a few flowering plants as asters, salvia and pansies.

Our earliest tomatoes are sown in the greenhouse about the first of March. When the plants have 4 or 5 leaves which will

be in 5 or 6 weeks they are set into hotbeds about 2½ inches apart and when about 4 inches high are set in the larger sized flats, six dozen to a flat. These sold last year for 15 cents per dozen. For home trade we pull them directly from the beds and charge 20 cents per dozen. Some of the plants are set in the flats directly from the seed flats but it is harder to secure uniform plants by this method.

Four inch pots are used in potting and plants from these sell for 60 cents per dozen. We grow the Buckstaff, John Buer and Dwarf Stone. While the last named is not a heavy yielder, the stocky plant it makes causes a demand for it which we try to discourage. To keep up a succession of plants, seed is sown every 3 weeks until the middle of April.

Egg plants, pepper and salvias are slow growing plants so we sow the seeds of these the latter part of February. When the plants have grown 4 or 5 leaves they are set in hotbeds about the same distance apart as the tomatoes and when 4 inches high they are set in the smaller sized flats, 2 dozen egg plants, 3 dozen salvias and 3 dozen peppers to a flat. The egg plants bring 25 cents, the salvias 30 cents and the peppers 15 cents per dozen.

The first cabbage, cauliflower and kohlrabi seed is sown about ventilation as weather will permit, so the plants will be stocky March 1st. They are grown as cool as possible with as much and hardy. In preparing a bed for cabbage, we first put about 3 inches of the well enriched soil on the bed and about an inch of soil on top of this that has no manure in it, sowing the seed in drills in this. It helps to prevent dampening off to which cabbage and especially cauliflower are particularly liable. When the plants are about the right size for setting we transplant into smaller sized flats, eight dozen to a flat. The cabbage and kohlrabi bring 10 cents and the cauliflower 20 cents per dozen. The home trade is supplied directly from the frames at 8 cents per dozen or 60 cents per hundred. To keep up a succession, seed is sown every three weeks up to the first of June. Caulifllower brings 15 cents per dozen.

For early cabbage we grow Jersey, Wakefield, Copenhagen, Market and Glory of Enkhousen and for later, Succession and All-seasons. For cauliflower Early Snowball and Dry Weather and White Vienna are the only kohlrabi we grow.

Celery, celriac and parsley are sown in flats in the green-

house, about the middle of February. The soil in the flats is smoothed off and firmed with a board and the seed sown and then a quarter of an inch of clean sand sifted over the seed to prevent dampening off. When the seedlings have 3 or 6 leaves they are set into the smaller flats 8 dozen to a flat, and bring 10 cents per dozen.

Asters are treated about the same as celery only the seed is not sown until the middle of March. Pansies are sown in July the year previous and wintered over in cold frames. When in bloom they are raised with a trowel and set into the larger flats 4 dozen to a flat. They bring 30 cents per dozen.

Of late years there has grown to be quite a demand for head lettuce plants. The seed is sown the middle of March and as soon as the seedlings have 4 or 5 leaves, they are set into the smaller flats 4 dozen to a flat and bring 10 cents per dozen. May King is grown mostly.

The greater part of our plants are sold to the grocer though we also have a good trade at home as small gardens are numerous in our vicinity. Occasionally when we have a large supply we advertise in the daily papers.

ORGANIZING A CITY FOR GARDEN WORK

PROF. JAMES G. MOORE, Univ. of Wis.

The call for increased food supplies in the early spring of 1917 found the largest number of non-producing potential producers, the city dwellers, entirely unorganized and to a large extent, uninterested in their part in food production. Necessity demanded that they be quickly educated to the importance of their efforts and the methods of accomplishing satisfactory results from them. Various agencies, public and private, at once attempted this task. As usual where there is lack of organization, there was much duplication of effort and not infrequently, conflict. I am not criticizing this condition, for it was doubtless the best that could be had under the then existing conditions. It certainly resulted in one unmistakable lesson, namely, that for best and

maximum results, *there must be* organization of the forces promoting gardening.

While it will not likely be possible, perhaps not desirable, under the new conditions, for gardening to hold all the ground it has gained during the past two years, it should be the job of organized horticulture to see that not all is lost, for the city garden must play a more important part in the future in supplying food than it did prior to the war.

DUPLICATION AND CONFLICT.

The duplication and conflict in city garden work in many instances in 1917 revealed the fact that *the direction of city gardening must be centralized.* That each agency which feels its duty lies in helping in the garden movement should not be permitted to map out its own course, irrespective of other agencies doing the same kind of work, but must become a part of a larger force whose chief function is correlation of effort. The first step, therefore, in organizing a city for garden work, is to *create a central body* which determines policy and delegates work. If several agencies have been interested in the work previously, it will usually be found desirable to have some more representative body assume the responsibility of the consolidation. The Chamber of Commerce seems to be the logical body to effect this organization. If no such organization exists then the Rotary or Kiwanis Club might well assume the responsibility. The chief requisite of the consolidating agency is that it be one under which all the independent agencies are willing to work.

The most important work of the consolidating agency is to *organize a central committee* which will include representatives of *all societies* actively engaged or interested in garden promotion. Nor should the personnel of the committee be limited to such representatives, but any individual who is sufficiently interested in the work to take an active and constructive part in garden promotion should be eligible to membership.

This central garden committee will be primarily a discussion group. It will be too large to effectively accomplish any of the detailed work, but it will serve the useful purpose of sifting the grist of ideas brought to its hopper, separating the wheat from the chaff. It will decide upon questions of policy, leaving the details of their execution to a smaller group especially charged with that duty.

The main feature of the central committee is the chairman. The essential qualities of the chairman are that he be a live wire, have executive ability, and be able to keep up the interest of the committee members. *It is not essential that he know anything about gardening,* but he must fully realize that he is charged with an important duty. He must be able to enthuse others sufficiently to get them to work and then keep them at it. He will find his powers taxed to the limit to keep the work confined to a sufficiently restricted field to actually accomplish results and not have the energy of the workers dissipated by attempting too many things. Each member of the committee is likely to think that his pet proposition is the most important and the chairman must not allow pet propositions to interfere with effective work.

SUB-COMMITTEES

The real work falls to the sub-committees. It is impossible to say how many sub-committees will be necessary—as it depends upon the size of the city and the nature of the work undertaken. In our organization in Madison, we found that the work fell under two general heads—*adult* and *children's* or *school gardens.* A sub-committee was therefore appointed to have general supervision of the work to be done in these two classes of gardens. It was also found desirable to have a special committee to handle the work among the industrial plants, this committee being made up of representatives of the larger concerns.

Not only is it important to have sub-committees for special phases of gardening, but also for various lines of work to be undertaken, for example, securing and assignment of lots, seed, plowing, etc. It is at once evident that there must be the closest co-operation between the sub-committees of the first group and those of the second. For example, the chairman of the industrial committee will inform the seed committee as to the desires of his group, while the seed committee will arrange for the purchase of the goods desired. The success of this sub-committee work will depend almost entirely upon the kind of chairman and their cooperation.

SUPERINTENDENCE

If the garden work is to include school or children gardening, an important part of the organization will be the *garden super-*

vision. A supervisor is necessary if group or community school gardening is to be done, and is desirable even if the children's work is to be confined to a home garden. If the garden supervisor be the right type of man, he will be of great value to the general chairman in directing the work. Our experience in Madison is that it is highly desirable to have some one on the job at the central office, most of the time, to iron out the wrinkles which are sure to appear in dealing with so many people. This is particularly true where lot assignment is one of the services undertaken by the organization. The garden supervisor seemed in our case to be the proper person to do this work.

The garden supervisor has direct oversight of garden instructors in the children's group gardens. He also visits at as frequent intervals as possible the children's home gardens, giving instructions and advice. In this service, he not only reaches the children, but frequently the parents as well. Providing this supervisor is unmistakably a responsibility which should be assumed by the *Board of Education.* It is high time that those interested in promoting gardening, insist that it become a part of the regular school work. *There seems to be no good reason why the Board of Education should not as legitimately provide for supervised gardening as for supervised play.* And many of us believe with much greater benefit to the child. This will only come, however, when those interested in gardening exert some pressure on the school officials, most of which usually needs to be applied to the city superintendent.

GARDEN ADVISORS

The question of superintendence of adult gardening represents grave difficulties. In fact, real superintendence is out of the question and yet many inexperienced gardeners fail because of inability to secure proper instruction at the right time. Some method of providing this assistance but at the same time avoiding any appearance of trying to interfere is highly desirable. The volunteer garden advisor or visitor system seems to fill reasonably well this need. It also serves the purpose of supplying a field of service in which a large number of persons interested in promoting gardening, who seem to be left out because of no vacant places on the various committees, may render valuable service. This is by no means an insignificant part of the work,

for it profiteth us little if we persuade a person to garden and he subsequently fails because we fail to supply proper assistance.

The city may be districted by blocks, wards, or parts of wards, as the number of garden advisors available permits. Each advisor will be assigned definite territory. He will visit the gardeners in his territory, especially the beginners, as frequently as possible and give such suggestions as may be needed. The best advisor will be the one who knows quite a little about gardening and a lot about getting the confidence and cooperation of people. In any event, the advisor must recognize the fact that like the proverbial horse, you can lead a gardener to water but you cannot make him drink, even though he be a beginner.

There are some things which should not be done in organizing a city for gardening. *There should not be over organization.* It is possible to build up such a complicated machine that all the energy is used in keeping the machine going. Committees intended primarily to give some one a job are a dead weight and should be avoided. Have only enough to accomplish effectively the work it is desired to do.

Don't be misled into the mistake of undertaking work which ends primarily in saving people money. Saving money for the gardener is a laudable service, especially when it affects those unable to pay the usual charges, but unless it encourages persons to garden who otherwise would not, the energy put into it is lost so far as promoting gardening is concerned. Busy men cannot afford to give their time and waste their energy for the mere purpose of saving John Smith 50 cents on plowing his garden or a quarter on his garden seeds, but if the plan will save enough 25 or 50 cents to get a number of John Smiths who did not plan to garden to do so, then it is worth while as a committee project.

The type of service which will help most, however, is in assisting the prospective gardener to secure those services and necessities of gardening which he has difficulty in securing for himself. If saving can be effected in rendering this service, it becomes just that much more attractive.

No one plan of organization will fit all cases, as varying conditions will make modifications necessary. The following plan used in 1918 in Madison was found effective for our conditions, although not all phases of work were fully carried out.

Central Garden Committee

Represented
Association of Commerce
City Schools
Horticultural Society
College of Agriculture
Industrial Concerns
Local Organizations
Interested Individuals

General Executive Comm.

Chairman, Central Comm.
Chairman Children's Gar.
Chairman Indus. Gardens
Chairman Adult Gardens
Garden Supervisor

1. Children's Group Gardens

Committee in Charge
Pres., Madison Garden Assn.
Representative of City Schools
Garden Supervisor

2. Children's Home Gardens

Committee in Charge
Pres., City Garden Assn.
Representative of Schools
Garden Supervisor
Representative from each of larger industrial concerns

3. Industrial Gardens

Chairman
Represetnative from each of larger industrial concerns

4. Adult Non-Industrial Gardens

Chairman Central Committee
Two other members
Sub. Comm.
Lot Assignment
Sub. Comm.
Plowing
Sub. Comm.
Garden Supervisors
Sub. Comm.
Seeds and Plants

COMMON INSECT PESTS OF THE GARDEN AND HOW TO CONTROL THEM

L. G. GENTNER, College of Agriculture

Those who planted gardens this past season are aware of the fact that to have a successful garden one must do more than just plant the seed. One should know how to prepare a good seed bed, when to plant the seed, how to cultivate the garden and keep it free from weeds, how to conserve the moisture supply, and last but not least what measures to use against insect pests that commonly infest the garden.

GENERAL PREVENTIVE MEASURES

An important step in guarding against an infestation in next season's garden is to remove and destroy all old stalks and refuse, immediately after the crop has been harvested as those furnish food with which the partly grown insects may continue their development and also give shelter for the winter. One should keep the garden free from weeds at all times as these also furnish food and shelter.

One of the essentials of a pest-free garden is to fight the "bugs" from the start and not to wait until there are large numbers. Under favorable weather conditions insects may develop very rapidly and before one is aware of the fact, the garden crops may be seriously injured.

Where insects are only few in number and easily seen they may be picked off by hand and destroyed, but where numerous, it is necessary to use other measures such as spraying. One should know something about the feeding habits of insects before choosing a spray. Any kind of spray cannot control all kinds of insects.

CHEWING INSECTS

Some insects like the Colorado potato beetle, having chewing mouth parts, bite off pieces of the plant and swallow them. These

insects may be controlled by spraying the plants with some arsenical poison such as lead arsenate at the rate of one ounce (15 level teaspoons) of the powder to each gallon of water. The spray should preferably be applied by means of a hand sprayer or knapsack sprayer in the form of a fine mist and the plants thoroughly coated. Lead arsenate may also be dusted on the plants early in the morning when they are wet with dew, diluted with 5 to 10 parts by weight of air slaked lime. For this purpose a cheese cloth bag or can with small holes punched in the bottom may be used.

Cabbage worms may be controlled by using only ½ ounce of the lead arsenate per gallon of water, but it is necessary to add an inch cube of laundry soap to each gallon of spray to make it stick and spread on the smooth cabbage leaves. Contrary to the popular belief there is no danger of poisoning to the consumer from spraying the plants with a poison as the cabbage grows from the inside out and the outer leaves are removed in preparing for cooking

SUCKING INSECTS

Some insects like plant lice have tiny beaks with which they pierce the plant and suck the juices from the inside. These cannot be controlled by poisons, but must be destroyed by a contact spray which kills them when it touches them. A 40% nicotine sulphate (Black Leaf 40) is the standard treatment. It should be used at the rate of 1 teaspoonful per gallon of water to which an inch cube of soap has been added. The soft bodied plant lice are generally found in masses on tender shoots and on the under sides of leaves often curling these badly. It is therefore best to apply the spray through a nozzle with a bent neck so that the under sides of the leaves are reached and the spray is forced into the curls. The spray must actually come in contact with the insects to be effective. Fish oil soap may also be used at the rate of ½ pound to 4 gallons of water.

INSECTS REQUIRING OTHER CONTROL

Cutworms feed at night on the foliage of older plants and cut off young plants at the surface of the soil. During the day they hide in the ground near the plants. A small number of

plants may be protected by cutting the tops and bottoms out of tin cans and placing them over the plants, pushing them well into the soil. The standard treatment for this pest is to apply poison bran mash to the soil in late afternoon or early evening. It may be either broadcasted or placed in little heaps about the bases of the plants. *Care should be taken to keep poultry and live stock away from it.*

To make up poison bran mash mix 2 ounces of Paris green or white arsenic, or 4 ounces of lead arsenate with 3 pounds of bran. Add 2 ounces of low grade molasses and ½ orange or lemon finely ground (or ½ teaspoonful lemon extract) to a small quantity of water. Then mix all together, adding enough water to make a crumbly mash.

Grasshoppers may be controlled by the use of poison bran mash made up as for cutworms, but scattered in the early morning instead of in the evening. Tomatoes or melons may be substituted for oranges or lemons. If the grasshoppers keep coming in from adjoining fields and grasslands, scatter the mash along the edge of the garden toward the fields and renew from time to time.

Flea-beetles are tiny jumping beetles either blackish or striped. They are not readily controlled by poisons, but may be repelled by spraying the plants with Bordeaux mixture which is made up as follows: 4 ounces bluestone, 4 ounces quicklime, 12 quarts of water. Dissolve the bluestone in a wooden or earthenware vessel, using hot water, and then add water to make 6 quarts. Slake the lime by adding water a little at a time. When slaked make up to 6 quarts. Pour the two solutions together through a strainer while stirring. The spray is then ready to be applied. Sometimes a combination of Bordeaux mixture and arsenicals is used against the flea-beetles.

Cucumber beetles. These yellow and black striped or spotted beetles are rather difficult to poison. Lead arsenate may be used as directed under chewing insects, or the plants may be kept thoroughly dusted with lime. A small number of plants may be protected by cages made by cutting a barrel hoop in two and nailing the two halves at right angles to each other, then covering with cheesecloth.

Root Maggots on cabbage and cauliflower plants may be controlled by placing tarred felt disks around the stems of the young plants when they are being set out. The disks should be firmly pressed against the soil. After the maggots have once be-

gun to work on the roots there is practically no remedy except to pull up and destroy the badly wilted and stunted plants.

No satisfactory control has yet been found against root maggots infesting radish, turnips and onions. Infested plants should be pulled up and destroyed. Small beds of radishes may be grown under a cheesecloth screen to prevent the fly of the maggot from laying its eggs on them.

Squash bugs cannot readily be destroyed by sprays. The bugs will hide under pieces of board or burlap placed on the ground near the plants and may be collected from under these and destroyed early in the morning. The reddish brown eggs are laid in clusters on the undersides of the leaves and may be gathered and destroyed.

Pea moth. The pea moth is becoming a rather serious pest of peas in the northeastern part of the state. The eggs are laid on the very young pods and the larvae hatching from these bore through the pods and feed on the kernels inside, covering them with webbing and excrement. Little has been done by way of control. Thoroughly cultivating the soil in fall or early spring will undoubtedly kill many of the resting stages which are found in the ground during the winter. Early blooming varieties seem to escape serious injury.

Garden snails. These slimy, crawling creatures are not insects, but nevertheless often cause serious injury to garden crops. They feed at night and leave a shiny, slimy trail behind them wherever they go. Poisons do not readily kill them. They will collect under pieces of wood or burlap and may be gathered early in the morning and destroyed. All rubbish and refuse should be cleaned up. The best treatment is to scatter lime in the places frequented by the slugs, over the ground about the plants and on the plants themselves. When the slugs come in contact with the lime they throw off slime until they finally become exhausted and die.

GARDENS IN SMALL CITIES

W. R. ABBOTT.

Last winter a garden committee was formed at Fort Atkinson to work with the Council of Defense in an effort to increase the production of vegetables and make the city as nearly self-supporting in this respect as possible. After several public meetings at which the speakers outlined the work and answered questions, a house to house canvass was made to find who had garden tracts to rent and who wanted one to work. I don't know exactly how many gardens we found for the workers but we did place a great many. There was hardly a vacant lot that was not used. We had trouble in getting them plowed. It seemed that nearly every teamster wanted to make from $10 to $15 a day and we couldn't find a way to get them plowed for less.

We made a pretty thorough distribution of the pamphlets sent us by the state committee and those sent out by the Federal government and urged the people to read them. This seems the important point in small towns,—to get the people to learn the up-to-date methods of gardening. Nearly every home in a small town has a fair sized garden. As gardening is only a side line it is not given much thought or study. As one professional man said to me when I asked him to go to one of the meetings, "Why I know how to plant a garden. I have had a garden for 25 years." If he planted his 1918 garden as he did 25 years ago, a little studying would make his 1919 garden much ahead of his 1918 garden. In Fort Atkinson, we can not increase the number of gardens much, but we want to improve the methods of planting and cultivating. Most of the gardens are not plowed deep enough. Some of the teamsters just turn over the top of the soil and then collect $1.50 to $2.50 for the plowing.

Another point is planning the garden so that there will be a variety of vegetables and not more of any one kind than can be used, not planting a whole packet of seed where ¼ or ½ is enough.

Another point the committee noticed. Many hoed their gardens to kill weeds but did not cultivate. Nearly everyone had a large enough tract to plant potatoes and the popular plan seemed to be to plant them about an inch or so deep and as soon as they were up three or four inches to commence to hill them up, drawing all the earth that would stay up around the plants. One retired farmer was noticed planting his this way and the committee asked permission to plant a row the way the county agent recommended. The row planted by the committee was a little slower in coming up, but soon caught up and in a few weeks could be distinguished some distance away by its thrifty appearance, when the hot and dry weather came. When the owner was asked what he thought of the two ways of planting and cultivating, he laid the better yield of our row to better seed. He said he had always planted that way and got a good crop if the seed and season was favorable. We tried to show him that with proper planting and cultivating and spraying he could get a fair crop when the season was not favorable.

If this work is kept up and an exhibition held in the fall showing what some can do who try improved methods, we can do a great deal of good. People who had a garden last year and enjoyed fresh vegetables are going to keep eating more of these, whether they grow or buy them. There will be more demand next year for better vegetables both from the home and market garden.

MILWAUKEE WAR GARDENS

C. D. ADAMS.

Since the days of Solomon Juneau there have been gardens in Milwaukee, but in recent years there had been a falling off in interest, until about the time of the beginning of the war in 1914. Enterprising citizens started a movement about that time which grew by leaps and bounds until practically every backyard and most tillable vacant lots produced food the past season. Two onions were made to grow where none grew before.

Something of our organization and methods of work was given

you at the Summer Session, by one of our very efficient garden visitors, Mr. Barr. That this organization was efficient we believe is proven by the results attained.

The first conclusive proof that our work had not been in vain was given when we held sixteen sectional exhibits at the same time in as many sections of the city and surrounding territory.

The exhibits were divided into two classes consisting of the adult and the junior garden produce—both fresh and canned vegetables. In most places an entire hall of a school was filled with the exhibit—the poorly grown and poorly exhibited beside those that would be a credit in a State Fair exhibit. The judges lost no opportunity to impress upon the teachers as well as the pupils the difference between a poorly selected and prepared exhibit and a well prepared one, thus giving it an added educational value.

All worthy exhibits were given a ribbon and those receiving a blue ribbon were entitled to take their produce to the Grand Central Exhibit at the Plankinton Arcade two days later. In this beautiful hall, right on the main thoroughfare of the city was gathered the best from almost 400 gardens, and your representative, Secretary Cranefield assisted in selecting the most worthy. To these winnere were given engraved certificates of merit as well as cash prizes ranging from one to fifteen dollars. Here again we insisted that every worthy exhibitor had something to keep as a reminder of his part in the work of feeding the world. We have here samples of these mementoes as well as photographs to prove that it was the largest show of its kind ever held in the state.

Previous Garden Commissions had realized that their work was not fully appreciated because there had been no way to say at the end of the season "We had in Milwaukee so many acres in gardens that produced so many dollars worth of food." So from the start the new Commission kept this in mind and determined to remedy it if possible. At the end of the season a well-defined plan to obtain a garden census had been formed, and the machinery made ready to carry it out. In this manner sufficient data was obtained to make a very reliable estimate of the results obtained.

When these figures were compiled, we admit that the value of the produce appeared so big that we almost doubted it ourselves until we reviewed some of the known results in certain districts.

One of the best places we had to use as a check for getting actual facts was the State Normal School tract. This one tract is fourteen acres in extent, laid out in lots 50 ft. by 50 ft. The soil was not of the best by any means and practically no fertilizer was applied. Accurate records were kept of some of these. One of the best gardeners' accounts showed that from his plot he took $85 worth of vegetables at the prevailing retail price. Yet we estimated the value of this entire plot at $25 per garden.

Let us remind you that there were here hundreds of gardens side by side and the rivalry between the gardeners was very keen. There was little difference in the tillage given—there was not a weedy garden there. The difference lay in the ability of the gardener to plan for best results. This being the case, some of you will wonder that we put the estimated value of the gardens so low. The reason for this low valuation was the reduced production on account of the continued drought during the growing season. The Government weather record shows that only .58 of an inch of rain fell during June, and the combined rainfall for June, July, August, and September, was only 4.15 inches, which is 7.73 inches below the normal for Milwaukee, for these months.

Your worthy secretary paid us an official visit during the summer. I feel sure he will bear me out in the statement that our estimate of this tract is conservative. Using data collected from every section of the city we estimate the total area in gardens to be 498 acres within the city limits, valued at $175,626. As you know, the area of Milwaukee is rather small compared with suburban community surrounding it, and when we consider that the best gardens were found in this district, we feel safe in saying that the war gardens of Milwaukee and its suburbs produced food valued at hundreds of thousands of dollars.

Aside from the food produced, we find it hard to estimate the educational value to the grown-ups as well as to the juniors. Some have learned that the price paid the trucker is not clear profit to him. One woman was heard to remark that if it required all that work to grow a few vegetables she would buy hers.

The people who have planted potatoes in stiff clay soil have learned that a patriotic spirit is not all that is necessary to win the war by producing food. Our Commission profited by the mistakes of the previous year when people indiscriminately planted potatoes without regard to the adaptability of the soil.

One of our problems was to keep enthusiastic women from planting good seed in stiff clay that could not be made to bring forth even two-fold in one short year. For these we provided good vacant lots in the suburbs.

We found that in every district there were public-spirited people who were not only willing but capable of being good garden visitors, even though they may not have been expert gardeners. These people have devoted time and energy helping others supply their own table with better vegetables than could be found on the hucksters' wagons.

Another encouraging thought to the true horticulturist is that this work has greatly enlarged the circle of these who see more in a growing plant than merely the food it will produce. The man, woman, or child who actually rejoices in the accomplishment of growing a good cabbage or big pumpkin will, when normal conditions obtain again, continue to plant a garden, but it will be embellished by a border of flowers and the unsightly square corners of the front yard will be made to blossom as the rose.

This reconstuction period affords a great opportunity for every member of this society to so direct the minds of his neighbors that progress will be made along the lines of beauty as well as utility and something of lasting and unmeasurable benefit will come from our "war gardens."

THE WOMEN'S AUXILIARY

MRS. N. A. RASMUSSEN.

Were I asked to write a biography of a pioneer horticulturist, the history of some organization of long standing on results obtained after several years of labor, I might have at least a corner stone with which to begin. However, as our Women's Auxiliary is a mere infant celebrating at this time its first birthday anniversary, I shall deal first with the "etc." and give as best I can the reasons for its existence.

About 9 years ago, for the first time, I accepted an invitation to attend the Winter meeting of the Wisconsin Horticultural

Society. I arrived in Madison in the evening of the first day and was immediately escorted to the meeting which was held in the Free Library. An elderly gentleman from Baraboo occupied the chair and a Sturgeon Bay orchardist was demonstrating tree pruning and planting. Looking about I noticed the room was pretty well filled—filled with men, but at the farther side of the room was a group of five or six women. I made my escape as soon as possible after the meeting adjourned but ventured out the next morning hopeful that there would be a larger delegation of women. This time however there were only two. Inquiring of a gentleman from Chippewa Falls, whom I met, if his wife were there he informed me he had never been blessed with a wife. Two other gentlemen of whom I made the same inquiry made similar replies whereupon I began to wonder if the Wisconsin Horticultural Society were sort of a bachelor's club and, if so, why was I there?

Time has proven the very opposite, however, for at each meeting a few new faces appear, women who in every sense of the word are true horticulturists, wives of some of the members or perhaps women so enthusiastic in horticulture that they are really responsible for their husbands being present. This has been shown by the faithful few who have reluctantly consented to appear on the program. Why do these women drop out after attending one or two meetings? Principally perhaps because there is not enough of interest to women on our program, the magnet is missing; then there being so few women in attendance one does not care to go and find herself one of two or three among 50 to 100 men, perhaps reading a paper on "Home Economics" or on the "Art of Jelly Making." The thought of eliminating the get together meeting at the hotel in the evening or the dispensing of the Summer meetings would surely keep the women from the Horticultural Society forever. Birds of a feather flock together, women love the companionship of their own sex and enjoy the social side of life but at the same time we are either bread winners or home makers and though horticulture may not appeal to every one of us from a commercial standpoint, the privilege is ours to use it as a means of elevating our homes and educating our children. Household duties should not absorb all the time and strength of the wife and mother but wherever possible we should secure the rest and

enjoyment that is obtained from a change of thought and scene. We should be able to look forward to our annual meetings as being a means of education in the study which the average woman holds above all else "The art of home making."

On whom rests the responsibility of the make-up of our programs? Why have we not had more topics of interest to women? Quite naturally you will say "on our Secretary, he makes out the program." To be sure he does but the demands of the present and the wants of our members designate the topics for discussion and the Secretary merely arranges them. Several years ago our programs dealt mainly with apple orchards, soil, cultivation, planting and pruning of trees, propagation, varieties, facilities for marketing, etc., with an occasional discussion on the growing of strawberries. Then came the cherry and plum orchards, the growing of small fruits such as the blackberry, raspberry and currant, and cranberries, then the farm garden with all its vegetables this culture and worth, the flowers of course always having a place on the program. Insect pests, plant diseases, spraying, materials and outfits also came in for considerable discussion. Later the home grounds, arrangements of trees and shrubs claimed no small amount of attention. Just at present home economics, farm home conveniences, methods of canning and preserving fruits and vegetables demand a place on every horticultural program and in consideration of this fact the women of the Society have decided that education along these lines might better be transmitted through an organization of women, women who have had successful experience in this work, and in consequence we organized the Women's Auxiliary at our last winter meeting and made known our wants to the officials of our Society. Here our plans met with hearty approval, were readily endorsed and we were offered every means of assistance possible to further our efforts.

Why had we not organized years ago that our labors might now be bearing fruits, our burdens be made lighter by the experience of others? Perhaps the thought had never occurred to us. Be that as it may, we must admit that the fault is ours, women of the Horticultural Society,—do not blame our Secretary. But, better late than never, let us begin now with full determination to make lasting impressions through our own undertakings.

Thus far we have done little except to organize, elect officers, draft and adopt a constitution with by-laws and pledge ourselves to try to be present at every meeting. We have 17 charter members but hope to equal or even exceed in numbers the male attendance at the meetings.

Our object is to promote Horticulture in the state of Wisconsin, to instill into the hearts and minds of women and children a love for the beauties of nature, to insert horticulture wherever possible into the general make-up of our farm homes and to educate ourselves to make home life more pleasurable every day we live. To keep the boys and girls on the farm is one of our problems of today. It is well-known that no one has more influence over us, creates more lasting impressions on us during our childhood than mother.

Then should not the sensible mother avail herself of every opportunity extended to learn those things which will help her to inspire a love for the pure and the beautiful in her child, those things which will help her to overcome the obstacles sure to present themselves, those things which help to make the daily tasks lighter and more pleasant? Children having been thus taught will appreciate their home environment and be happy and contented in the dearest spot on earth.

We aim to be a material help to the Society in many ways. We do not want to be a separate organization apart from the rest. We simply wish to devote a part of the time at each meeting, perhaps half a day, to topics especially interesting and educational for women and can arrange to hold this session when the subjects on the regular program are of value particularly to the men. Our topics and discussions shall deal strictly with Horticulture and Home. No school for training husbands will be conducted as it is a well-known fact that all true horticulturists, due to mothers' early teachings, are model husbands.

We hope to be able to arouse interest and enthusiasm in all the women connected with the Society as well as many of our friends at home who no doubt will be glad to become one of our number, which will mean two new members for the State Society. We might also relieve the Secretary by providing a part of the program and entertainment at the annual convention which will help to swell the attendance.

The growth and success of our local society is due largely to the work, influence and zeal of the women and since we justly

share the credit for enlarging our membership from 15 to 104 let us unite our every effort and offer to lend a helping hand in making the Wisconsin State Horticultural Society the largest and strongest Horticultural Society in the United States.

WOMEN IN AGRICULTURE

MRS. W. A. TOOLE.

It is conceded by sociologists one of the most impressive and portentious developments of our twentieth century is the woman problem. Call it Feminism, the "New Woman," movement or what you will, this social evolution of woman is gaining ground. It is past the stage of ridicule. It is a serious matter of grave importance to every thinking man and woman.

What is the race going to do with the woman? And what is woman going to do with the race?

About a generation ago man began to admit that woman is not the source of all evil, as the ancient philosophers would have us believe, nor yet the angel of the idealists. It was then discovered that she was a human being, with wants, desires and limitations similar to those that have occupied the attention of the sterner sex throughout time, and insured the slow but sure progress of civilization.

Until the natural growth of civilization brought about a new order of existence the average woman was conceded to be but a necessary evil, and outside of wifehood and motherhood she was never taken very seriously, but as a plaything for man's comfort or pleasure. She was reared, educated and trained to minister to him, but with the gradual enlightenment brought about by a mutual understanding, it is admitted, except in rare instances, her life line runs parallel with man's. And nowhere is this more a reality than on the farm where the lives of the two are so peculiarly dependent one on the other.

The farmer and his affairs, particularly his shortcomings, has ever been a favorite subject for would-be reformers. He is a popular target for the class of writers who go gunning in the rural districts for "types", and for many years the tiller of the

soil was referred to as "one who breaks clods and sprinkles himself with hayseed."

With the gradual advance of farming interests however an acknowledged place has been given him in the world's progress and now this class of critics content themselves with a discussion of how many times he changes his shirt in a week or takes advantage of the bath tub and tooth brush; while his wife's capability of upholding the standard of right living in the farm home is frankly questioned.

Today there is a tendency among certain classes to go to the other extreme and picture the farm home as ideal, leaving nothing to be desired. This is especially so since the world war has emphasized the dependence of all classes on the source of our food and the common necessities.

The average farmer, certainly, is rapidly coming to the foreground in the eyes of the world, and is being more talked about than almost any other man. Particularly do people who want his good will, his vote, and his products recognize his importance and call him the backbone of the nation, the foundation stone of all our industry, and other similar high sounding names.

But no good word of him can be said that cannot equally be said of his wife, and no advantage he receives that is not shared by her.

With the advent of better means of travel and communication with the outside world, such as the automobile, telephone and daily mail delivery, the women on the farm no longer suffer isolation. Their modern homes are built on a firm financial foundation equipped with conveniences which go far in solving the ever present problem of efficient help. There are, of course, a certain percentage who still cling to old methods and fail to interpret things by new standards. Careful and conservative they do not avail themselves of all they might under the new conditions.

With all that is, and may be said to the contrary, I believe the average farm woman who has shown a genuine interest in the practical labor saving devices and has been alert to make use of them in the true economy of household efficiency, has been met more than half way by the man of the house, has been encouraged and abetted in her efforts.

When more of the "hard worked" women in the farm homes as well as elsewhere, awaken to the fact that working with the

mind as well as with the hands is necessary, that time saved through eliminating unnecessary effort is not time wasted, much of the cry of drudgery will be silenced, the senseless sympathy, and misplaced efforts of would be reformers along this line will be changed by the necessity of striving to keep up with the pace set by the erstwhile "drudge."

The old hue and cry concerning the prevalence of insanity among the women of the farm has become simply a subject for jest for those who realize its absurdity, as also the idea that all the bad air in the country has been shut up in the farm homes.

You may have observed how the propaganda for social reforms sweeps the country in succeeding waves of public interest that follow each other in as regular succession as the styles from Paris (or should I say New York?)

There is the periodical wail of the downtrodden women on the farm, in whose drab existence they see only hopeless drudgery. The failures tell their story in all the miserable details, they glory in gloom, and picture the lot of the majority as misfortune, woe, submission to the wrongs imposed by the strong upon the weak. They wish to assure themselves that all may know the so-called lures and enchantments of country life are miserable frauds and figments of the imagination.

We have no use for successes or non-successes engaged in home-making, or any other enterprise, who lay claim to perfection or infallibility; nor have we ever heard of any failures who lay claim to imperfection. Ninety per cent of those who tell the world their tale of woe in all its petty detail charge up all the imperfections to the other fellow.

Where failures are the result of wrong doing of others however, we have need to consider ways and means of adjustment, through broadening our outlook by a sympathetic understanding of all the conditions to be met with in living in the country. In no way has this understanding and betterment of conditions been more quickly assured than by a cooperation of both the men and women in social enterprises, where they are brought together, to discuss their mutual and individual problems on the farm and in the home. Such cooperation will improve, dignify and brighten farm life in all its branches. Especially do they prove to the wife and daughter the difference between existing and living, and soften many of the hard lines that come into the day's work.

Through social intercourse such as cooperative clubs and societies the great problems of conservation, public health and rural education are brought before the people as well as the more intimate discussions concerning the many problems of daily life in the fields and in the home.

The rural educational standards are being raised, the curriculum of the schools revised, eliminating non-essential of academic subjects, strengthening the course in agriculture and adding courses in practical manual training and domestic arts. Teachers are required to pass more rigorous examinations and to prove themselves more competent to have the guidance of children whose minds are in the formative period.

Through parent-teacher associations the school and the home are brought into closer communication, resulting in a more sympathetic cooperation toward a common end. Medical inspection, the school nurse, playgrounds and school gardens are some of the opportunities made possible by such cooperation.

One problem which the people of the farm have still before them is that of satisfactory help, both in the house and out. The peculiar conditions met with in rural districts requiring the housing of the help or taking them into the home makes this more difficult of solution but a closer attention to cost accounting will go far in securing more satisfactory results. This will necessitate, however, working on a schedule of hours and paying accordingly, a plan not easily adjusted to mutual satisfaction. The business of the farm home is scattered, the laborer does not wash or cook all day, but of necessity spends considerable time in going fom one job to another. There is therefore inevitably a considerable amount of lost time that somebody must pay for, even though it is unproductive.

"Oh! But," says the business man, "the housewife should organize her business so there would be no lost time." A beautiful theory, but let the business man understand that the home is a kind of factory in which but few workmen are employed, but those few must deal everyday with many problems, with machinery of various designs and purposes, with the season, local conditions and last, but by no means least, with human nature for here on the farm the employed and the employer must inevitably come into closer communication than elsewhere. I know of many instances where the women of the farm have taken onto themselves outside duties, doing chores

and working in the fields in order to avoid the hiring of help, but I do not feel this a satisfactory solution. In fact, almost invarably it results in broken nerves and health, neglected household tasks, and a general lowering of the standard of living.

The great war with its far-reaching effects has brought a change perhaps unequaled elsewhere than in the realm of woman kind, and nowhere is this more apparent than in agricultural districts.

The notion that the woman-power of a nation is not to be directly utilized in war work has been blasted into the limbo of discarded things by the guns of Europe.

In responding to the call for men the women were left at home, unaccustomed duties were thrown upon them, and they have met them with as much courage as did the men in the trenches. While the farm lost only a moderate percentage of its manpower into the army, it has also lost a share of its labor by the demands of industries and the lure of the cities, and yet is called upon to increase its productiveness.

The six or seven millions of farmers' wives have responded to the call, many have gone into the fields in this emergency, and more, less picturesque than the farmerettes, have taken upon themselves the burdens of conservation in all its details. In the kitchen before daylight and long after dark, they cook, conserving to the last degree, sew and mend and to the limit of their strength are the world's strictest economists.

During the year 1917 the women under the instruction of the trained experts sent out by the Department of Agriculture canned over thirty-five million containers of fruit and vegetables, and the girls over fourteen million containers. This does not account for the larger per cent which was done privately and gives us but an approximate idea of the amount canned and dried during 1918 which assuredly was far in advance of the year before.

Through the Red Cross activities and other war measure agencies the women have been brought into more sympathetic relations, have earned the value of uniting their efforts in a common cause and have a fuller realization of their responsibility for the welfare of human life, not only for those of their own family but for the larger family of the state.

Through organized cooperation for a universal cause the women of the country and the city have learned much that will

be necessary in meeting the greater responsibilities that are surely coming, when they are placed on an equal footing with the men of the Nation, and have more than a silent share in the shaping of civilization.

Comparison of rural conditions with those of the city are constantly being made, much to the disparagement of one or the other as the case may be. This idea of class superiority between city and country is absurd.

"Everything in Nature contains all the powers of Nature," Emerson says, and continues "Everything is made of one hidden stuff. Every occupation, trade, art, transaction is the compend of the world, and correlative of every other."

Then why argue that a life spent in either the country or the city must necessarily be superior to the other? Each has its opportunities and disadvantages, each its successes and failures.

There is a distinction between classes of individuals that which, aside from environment, mark the line of demarcation the world over. That indeed which occasions the classes, the ideal.

"To have an ideal or to have none, to have this ideal or that—this is what digs gulfs between men, even those who live in the same family circle, under the same roof, or in the same room." But the ideal has to do with the individual more than the class. Our associations may affect our ideals to some extent but if we are not associated in interests we certainly cannot expect or desire to become closely associated in a social way, except in rare instances.

With the beginning of a new vision of farm life, the rise of the science of agriculture, the goal won is a good home, simple healthy pleasures, increased self-respect, education and comforts for all the family, the wherewithal to help build up the community and the Nation.

The Nation is just you, and you and you—all of us, and unless each person does his or her level best the Government cannot do its best in settling the world problems before us.

As for the year of peace and promise which is at its dawn, we cheerfully predict a response to meet every requirement, in which the woman of the farm will do her full share as she has done in the past.

ROSES, AND THEIR CULTURE OUTDOORS

FRED W. SPARKS.

Beecher, the great American preacher, said, The sweetest thing that God made and forgot to put a soul in, is the rose; the Queen of flowers.

This title might appear to be somewhat of a misnomer, when applied to the blooms so often seen in gardens of the mid-west.

I have no intention of asserting that we here can grow roses to equal those grown in the British Isles, or those of the Pacific coast, yet if we observe the many details so essential to success, roses of good quality will be our reward.

Dean Hole, the great English rosarian, says in his "Book About Roses," "He who would have beautiful roses in his garden must have them in his heart. He must love them well and always. To win, he must woo as Jacob wooed Laban's daughter, though drought and frost consume."

The first and chief essentials are suitable soil and location.

SOIL.

Roses thrive to perfection in a somewhat heavy soil; that known as a clayey loam being the best.

Soils that are light and sandy in character, may be built up by the addition of friable yellow clay, turf sod, that has been stacked at least six months, and good cow manure.

All soils should be freely sprinkled with coarse bonemeal before digging; this tends to the production of a good firm growth.

SITUATION.

This, if possible, should be on a gentle slope; should be well drained, and exposed to full sun and air.

Shelter from the north and east wind is desirable, though it should be far enough away to cast no shade upon the plants, and to prevent roots of trees from robbing the rose garden of its fertility.

HOW AND WHEN TO PLANT.

The two months most suitable for planting dormant stock, are October and April. Potted plants may be set out as late as June, but even these are benefited by early planting.

The distance between each plant may be governed by the size of the bed; 20 to 24 inches apart is the best distance.

What is known as "worked stock," i. e., that which has been budded or grafted on Brier or Manetti roots; should be planted deep enough so that 2 or 3 inches of soil cover the point of union between scion and stock.

While touching upon this question of worked stock, it brings up the oft discussed question, as to which is best, stock that has been so treated, or that growing upon its own roots.

It has been proved that many varieties do as well or even better on their own roots; but taking all varieties into consideration, there is no doubt that the budded or grafted stock will be the more satisfactory. The deep planting previously recommended of this stock also encourages the production of roots from above the point of union, thus making success doubly sure.

Careful watch must be kept during the summer months for sucker growths. These spring from the stock on which the plants have been "worked," and if allowed to remain they would soon smother the plant. They are readily detected by having seven leaflets instead of the usual five; whilst the stems are covered with reddish hairlike spines. Cut, or break them off cleanly at the point where they originate, otherwise their removal would be only temporary.

PRUNING.

This is governed by the type one is pruning. The "hybrid perpetual" class are best when pruned back rather severely; some exhibitors prune them within a few inches of the ground, but this is unnecessary for garden purposes, and 12 to 15 inches will be found to produce flowers of good quantity, and quality.

In the case of "hybrid teas" the methods differ; though some will be found so vigorous that the pruning recommended for "perpetuals" will suffice; others will require little pruning with the exception of cutting off the tips, removing side branches and all weak, straggly growths.

The best time for pruning is the month of April when the sap first commences to flow, and the buds are beginning to swell. Always prune just above a bud pointing outward; this keeps the center of the plant open to admit light and air, and preserves a good shape.

WATERING.

Though the rose does not like "wet feet" they will require frequent soakings of water during the hot, dry weather, previously sprinkling the beds very lightly with bonemeal, and at such times a forcible spraying with water from the hose will help to keep the plants clean and free from red spider and thrips.

MULCHING.

In July a good mulching of cow manure will help conserve the moisture in the soil; and build up a good growth for the following season. Frequent waterings of liquid manure are also very beneficial.

CONTROL OF INSECT PESTS, AND DISEASES.

For the destruction of Aphis, or green and black fly as it is usually termed; nicotine solutions will be found the most effective. There are many different brands on the market, the price differing according to the percentage of nicotine they contain. They are put up in cans of varying size, with full instructions for mixing.

For the rose slug, which is really the larva of a small moth, and is readily detected by the skeletonized appearance of the leaves; constant spraying with arsenate of lead has been found very effective. Some people object to the white deposit this leaves upon the foliage, and have found hellebore powder dissolved in boiling water, at the rate of a tablespoonful to 5 gallons an equally good remedy.

Lime sulphur solution will be found best to combat the leaf spot, and dry powdered sulphur dusted on, the best remedy for mildew.

GENERAL CULTIVATION.

The beds should be dug over in the spring, after pruning has been done; giving them a good dressing of bonemeal. Keep them

thoroughly cultivated, for the double purpose of preventing growth of weeds, and conserving soil moisture. After they have been mulched cultivation will not be quite so necessary for a time, but weeds must be pulled out, for these beget insect troubles.

Disbudding must be attended to, removing the side buds, and allowing the central one to remain. A variety such as Gruss an Teplitz, is in my opinion better left undisbudded.

WINTER TREATMENT.

Owing to the rigorous winters we experience here, great care must be taken in the covering of all roses. Soil heaped up around the base of each plant, and left till hard frosts set in after which it should be covered with leaves, hay, or any dry litter, is the most satisfactory method; but is not always practicable.

Another way is to bend the tops of the plants over and securely peg them to the ground, waiting as previously advised for the ground to freeze, when they should be covered with at least a foot of dry leaves; marsh hay being placed on top to prevent them from being blown away. This covering may be removed in March. It is better not to remove all at once as hot suns and cold winds are apt to damage the wood so long covered.

I feel that this paper would be incomplete if I did not make mention of the climbing, or rambler roses. The treatment of these is necessarily different. After blooming, the old wood should be cut entirely away, and a good dressing of cow manure applied to the roots, which will cause the production of strong, vigorous shoots, which sometimes will attain the length of 12 feet, by the end of the season. During their growing season they must be kept constantly tied, and if these new shoots are produced too profusely they must be thinned out, for it is the well ripened wood that will produce the best results. In the winter they must be taken down from their supports, and well covered as previously advised for other varieties.

Some people will say, "Oh, I like roses well enough, but I have no time to attend to them!" To these I would recommend a few of the Rosa Rugosa hybrid, Conrad F. Meyer. It is perfectly hardy, requires little pruning unless it be to remove dead wood, and seems quite at home in any soil or situation.

VARIETIES.

Hybrid perpetuals—Frau Karl Druschki, J. B. Clark, Ulrich Brunner and Mrs. R. G. Sharman Crawford.

Hybrid teas—Maman Cochet, Gruss an Teplitz, Lady Ashtown and Ecarlate.

Climbing or rambler types—Crimson Rambler, Dorothy Perkins, American Pillar and Tausendschon.

DOMESTICATING OUR NATIVE WILD FLOWERS

WILLIAM TOOLE, SR., Baraboo, Wis.

Why should we plant our native wild flowers in our gardens when they may be had for the gathering from our roadsides, our woodlands and marshes? We may wish to do so for reasons of sentiment, and also because of their intrinsic beauty.

These beauties of our wild lands are free to the finder but yearly they become more scarce. The green groves have passed away from many a hillside; field crops now grow where we used to gather the wild phlox and the painted cup, and farther apart are the wild ladyslipper or moccasin flower. Less frequently than formerly can we gather armsful of our Turk's cap lily.

I do not now know just where to go in Sauk county to find the side saddle flower of the Pitcher plant, also several of the orchid family as Pogonia, Calipogon and the showy orchis. The trailing arbutus plant is becoming so rare here one should keep secret the knowledge of the few plants that are left.

Pleasant recollections of trips to woods and fields for nature study or for enjoyment of the surroundings, bring to us longing for the beauties we have discovered in out of the way places. We associate in our minds certain species with special surroundings or conditions, and we at first thought that wild plants would succeed only under such circumstances to which it seemed as though they were wonted. With closer observation we note that many wild plants succeed in their native way under

widely varying conditions. For instance, here in Sauk county we expect to find the prairie phlox in open brush lands where the soil is lighter than what we would call sandy loam. In my collection of this phlox the choicest varieties which I have of the species were gathered in a marsh south of Madison. We find the wood phlox here only in the rich soil of the timberlands yet in Indiana, last spring I found the two species in some instances growing together although generally in separate localities.

Our spider lily, Tradescantia Virginiana usually colonizes in light soils yet I have found it also thriving near marshy ground in a black peaty soil.

The showy lady slipper is described in the botany as growing in marshy ground. I have often found it but never in wet or marshy situations. While it is well to study the preferences of various plants to some extent, the prime need of most of them is a chance to grow without being crowded out with grasses and other plants. When given good garden cultivation a number of kinds of our wild plants, will thrive better than we find them doing in their native habitat. Even plants seemingly so retiring as the hepatica and the harebell if given a chance in cultivation will attain to a size of plant exceeding any we find in a wild state. Some kinds are not deeply rooted and may need some artificial watering in a prolonged dry spell, but nearly all of them are satisfied with good cultivation.

I have tried to give to some plants what seemed like natural conditions in a wooded slope where the soil is good, and leaf mold abounds, but both species of phlox, Jacob's ladder, hepatica, and others do better in the open with cultivation. The wild Turk's cap lily enjoys a place of its own and prefers cultivation in good soil although it is mostly found in moist wild meadows.

Of course these native plants of various kinds should not be forgotten when not in flower, otherwise weeds will crowd them out. Some kinds show their beauty and make their growth in spring and early summer, dying down to the ground early—their places should be marked. This class includes blood-root, Dutchman's breeches, green dragon arum, adder's tongue, spring beauty.

There are but few annuals and not many biennials among our native wild flowers that are worth considering as attractive.

A convenient time to collect and transplant most of these native flowering plants is when they are in flower, as they can then be most easily identified. I have had good success in moving a number of kinds at that stage of growth. Some kinds bear moving best during the short resting spell which follows their season of blooming. This is so with the moccasin flowers or cyprepideums, the lillies, and I think the lupines or sun-dial. I have not had good succeess with the lupine and would like to try them from seed. The Badger flower Anemone pulsatila is impatient of removal in early spring. I shall try it sometime after the seeds are ripened.

When moving these wild plants, care should be taken to secure plenty of roots which should not at any time become dry. Soil taken with the plants helps to save the roots, but when I know that I can make the roots safe I sometimes shake away the soil for convenience in packing to carry them home. With a stout trowel to dig with, and plenty of paper and baskets for packing one can make them safe for carrying home,—just as safely as plants can be sent a long distance by express. Some kinds can be conveniently raised from seed as I have done with our native phlox, the cardinal flower, black-eyed Susan, the compass plant and others. With seedlings there is a chance for variation and through selection one can plan for bringing out new varieties. Such opportunities are manifest in the phloxes, Jacob's ladder, the native asters, black-eyed Susan, wild lilies, pleurisy root and others. I have derived much satisfaction from this work with some of the kinds.

In planting I would advise grouping together low growing, early flowering kinds. In this class I would list hepatica, spring beauty or claytonia, lungwort or mertensia, Dutchman's breeches or dicentra, Rue anemone or anemonella, isopyrum, wood anemone, Jacob's ladder, the pasque flower called by some the Badger flower, dog tooth violet—both white and yellow, northern bedstraw, blood root, marsh marigold, both of our native phloxes, wild columbine, yellow pucoon, harebell, some of the early meadow rues or thalictrums, wake robin or trilium, violets in variety, trailing arbutus if you can make it grow, and others which are worthy of a place with these. Those who choose to grow but few kinds would probably make a choice from this list. Individual preference might lead to choice of other kinds.

Perennial plants and shrubs go well together, those who have room and choose to do so can make pleasing combinations of our native plants with shrubs.

Sometimes there is a desire for plants which will give flowers under the shade of trees. While no plants will make their best showing in such a situation, some of our natives adapt themselves to such a use. For such a purpose I recommend the white Eupatorium or white snakeroot, Joe Pye weed, and some of the native asters such as novae angliae and our native phlox.

This paper is not written to persuade anyone to cultivate our native flowers but to encourage those who desire to do so and hesitate because of lack of experience. If the work is commenced in a small way, interest and experience are soon acquired. To be able to recognize and name our native flora with the feeling that they are familiar acquaintances adds much to the joys of outdoor life. I would urge anyone to not assume an appearance of pride in not being able to remember botanical names. To forget names should be tolerated in old people but is not helpful to the young. When I came to Wisconsin sixty years ago next spring I soon noticed that there was a wide range of flora differing from those with which I had become familiar in Rhode Island. Of course I wished to know the names and learned that the same common name might be applied to a number of different species. There were pinks without end, bunch pinks, squaw pinks, prairie pinks, Indian pinks and some that have got away from my recollection. Blue bell and Mayflower were applied indiscriminately, and there were snake root and snakeweed without rest.

Wood's Class Book of Botany introduced me to a large class of acquaintances and a world of satisfaction. The hard names are not troublesome but the habit the botanists have of changing old established names is disconcerting. Most people have accepted a number of botanical names as a matter of course. Why not acquire knowledge of enough names to make the list of value in identifying such as should be old acquaintances. I here offer a list of kinds of flowering plants which I think are worthy of cultivation. Perhaps someone's favorite has been omitted.

I thought of making this a descriptive list but there are so many worthy kinds a book instead of a short paper would be

needed. The scientific names will assist in searching for descriptions in any standard book of botany and the exercise would be a good introduction to friends whom all should know.

Shrubs and acquatics are omitted.

List of native ornamental plants recommended for cultivation.

Botanical	Common Names
Tradescantia virginica.	Spiderwort, Spider Lily.
Uvularia perfoliata.	Bellwort.
Lilium Philadelphicum.	Woods Lily.
Lilium superbum.	Turk's Cap Lily.
Polygonatum biflorum.	Small Solomon's Seal.
Polygonatum commutatum.	Great Solomon's Seal.
Trilium grandiflorum.	White Wake Robin.
Iris versicolor.	Blue Flag.
Dioscorea vilosa.	Wild Yam.
Cypripedeum hirsutum.	Showy Lady Slipper.
Cypripedium acaule.	Stemless Lady Slipper.
Cypripedium parviflorum also variety pubesceus	Yellow Lady Slipper.
Cypridelum candidum.	White Lady Slipper.
	A common name for cypripedium Moccasin Flower.
Orchis spectabile.	Showy Orchis.
Habenaria, several species.	Fringed Orchid.
Epactris repens.	Rattlesnake Plantain.
Aplectrum hyemale.	Putty Root—Adam and Eve.
Asarum Canadense.	Wild Ginger.
Claytonia virginica.	Spring Beauty.
Ranunculus, several species.	Buttercups.
Thalictrum, several species.	Meadow Rue.
Anemonella thalictroides.	Rue Anemone.
Isopyrum biternatum.	No common name known.
Hepatica acutiloba.	Liver Leaf.
Anemone patens.	Pasque Flower, Badger Flower.
Anemone quinquefolia.	Wood Anemone.
Anemone canadensis (Pennsylvanica)	
Clematis virginiana.	Wild Virgin's Bower.
Clematis verticulata.	Purple Wild Clematis.
Arisaema dracontium.	Green Dragon, Dragon Root.
Arisaema triphylum.	Jack-in-the-Pulpit.
Pyrola Americana.	Shinleaf.
Pyrola asarifolia.	Shinleaf.
Caltha palustris.	Marsh Marigold.
Aquilegia canadensis.	Columbine.
Actaea rubra.	Red Baneberry.
Acetaea alba.	White Baneberry.
Polypodium peltatum.	May Apple, Mandrake.
Caulophyllum thalictroides.	Blue Cohosh, Pappoose Root.
Sanguinaria canadensis.	Blood Root.
Adlumia fringosa.	Mountain Fringe, Climbing Fumitory.
Dicentra cucularia.	Dutchman's Breeches.
Dicentra canadensis.	Squirrel Corn.
Baptsia villosa.	False Indigo.
Baptsia leucantha.	False Indigo.

Botanical	Common Names
Lupinus perennis.	Lupine or Sun Dial.
Amorpha canescens.	Lead Plant.
Tephrosia virginica.	Hoary Pea.
Apios tuberosa.	Wild Bean.
Oxalis violacea	Wood Sorrel, Ladies Sorrel.
Euphorbia corollata.	Flowering Spurge.
Impatiens pallida.	Jewel Weed, Wild Balsam.
Impatiens biflora.	Jewel Weed, Wild Balsam.
Hypericum, several species.	St. John's Wort.
Viola, several species.	Violets.
Opuntia Rafinesque.	Prickly Pear Cactus.
Opuntia fragilis.	Prickly Pear Cactus.
Epilobium angustifolium.	Willow Herb.
Oenothera biennis.	Evening Primrose.
Aralia racemosa.	Spikenard.
Epigaea repens.	Trailing Arbutus, May Flower.
Dodocatheon media.	Shooting Star.
Gentiana crinata.	Fringed Gentian.
Gentiana Andrewsii.	Closed Gentian.
Geranium maculatum.	Cranesbill.
Asclepias tuberosa.	Butterfly Weed, Pleurisy Root.
Aselepias incarnata.	Swamp Milkweed.
Phlox pilosa.	Prairie Phlox.
Phlox divaricata.	Woods Phlox, Blue Phlox.
Polemonium replans.	Valerian.
Hydrophyllum virginianum.	Water Leaf.
Mertensia virginica.	Lungwort.
Lithospermum hirtum.	Hairy Puccoon.
Lithospermum canescens.	Hoary Puccoon.
Lithospermum longeflorum.	Fringed Puccoon.
Physostegia virginiana.	False Dragonhead.
Monarda fistulosa.	Horsemint, Wild Bergamot.
Helenium autumnale.	Sneezewort.
Penstemon hirsutum.	Beards Tongue.
Mimulus ringens.	Monkey Flower.
Veronica virginica.	Culvers Root, Speedwell.
Gerardia grandiflora	and other species.
Castillega coccinea.	Painted Cup, Bloody Warrior.
Galium borealis.	Northern Bedstraw.
Mitchella repens.	Partridge Berry.
Campanula americana.	Tall Bluebell.
Campanula rotundifolia.	Harebell, Bluebell.
Lobelia cardinalis.	Cardinal Flower.
Lobelia siphilitica.	Great Lobelia.
Eupatorium purpureum.	Joe Pye Weed.
Eupatorium urticafolium.	White Snake Root.
Liatris scariosa.	Blazing Star.
Liatris spicata.	Kansas Gay Feather.
Solidago, several species.	Golden Rod.
Aster Novae Angeliae.	New England Aster.
Aster Novae Belgii	and several other species.
Anaphilis margaritanica.	Pearly Everlasting.
Silphium laciniatum.	Compass Plant, Rosin Weed.
Silphium perfoliatum.	Cup Plant.
Silphium terebinthinaceum.	Prairie Dock.
Rudbeckia laciniata.	Cone Flower.
Rudbeckia hirta.	Black Eyed Susan, Nigger Head.
Achillea millefolium.	Milfoil, Yarrow.
Heliopsis scabra.	Ox Eye.

BEES AND HORTICULTURE

N. E. FRANCE, Platteville.

There is in plants or flowers what answers to sex in the animal world. In some cases both sexes exist in the same flower, but in general, separate plants of same kind depend upon bees and insects to transfer the pollen of one flower to another in order to reproduce fruit or seed. The U. S. Dept. of Agriculture, also almost every State experimental station, university, and county school has proven by extended work with like results. The apple, pear, apricot, peach, plum, bush fruits like currant, gooseberry, raspberry, blackberry, also many garden and farm crops depend on insects, especially bees, to transfer the pollen from flower to flower. These experiments have been mostly by counting a certain number of buds about to open, and covering them during bloom either with paper bags, fine netting or inside greenhouses, and a like number of buds on same branch, or near by plant, uncovered, and watching number of times any insect visited the uncovered blossoms, and after bloom season was over to uncover the protected blossoms and note results. Allow just a few reports:

Apple 40 blossom buds, covered, not one fruit set and 15 matured apples from uncovered.

Oregon experiment of 87 varieties of apple, using 4800 paper bags, no fruit set.

Crab apple 200 buds covered not one fruit.

Pear 140 covered, no fruit set.

Cherry 300 buds covered, 9 set and fell off and 119 from uncovered.

Red clover 10 heads, no seed and 191 seed from uncovered.

White clover 10 heads covered, no seed and 541 seed from uncovered.

A red clover field was selected, and mosquito netting 6 ft. square, covering 100 heads at bloom season, same amount uncovered by side of it. First crop covered heads had no seed and un-

covered 10 seed. Second crop showed 2 seed under covered and 612 seed in uncovered, and another similar group of bloom near bumble nest had 2300 seed. The red clover blossom is too deep for the honey bee and has to be fertilized with the late hatched bumble bees. Australia could not produce red clover seed until bumble bees were imported. Kansas has proven its great fields of alfalfa must have bees near the same to produce abundance of seed. The field near a commercial apiary produced 66 per cent more seed than same size field not near any bees. The only place in Wisconsin where alfalfa seed matures is on farms adjoining the most extensive Wisconsin beekeeper. In New York where best grade of buckwheat is produced, has 670 colonies of bees in sight of those crops.

Not all of Wisconsin is commercial orchard nor is horticulture everywhere profitable, but I have noticed such sections that are most profitable in fruits are those where commercial beekeeping is found. There are several fruit growers in Wisconsin that keep a few colonies of bees in the orchard simply to insure better set of fruit. Often large orchardists have asked me where they could secure some good beekeeper to move his bees to their orchards.

The bloom season in Wisconsin is so short and liable to bad weather during open bloom, that a single day with bees near by, will give good fruit crop, and another orchard a mile away will be a failure. About 1865 fruit growing in California began to develop, in San Diego county, although there was an abundance of bloom and fine weather, the set of fruit was small. In 1870 some bees were introduced, insuring a fruit crop and the honey product was 3,700 lbs. in 1871; 17,000 lbs. in 1873; 61,000 lbs. in 1896; 15 carloads, in 1897; 85 carloads honey, with corresponding increase in fruit.

In the raisin district trouble arose between beekeepers and raisin producers, so the latter petitioned to have the bees removed from that county, claiming the bees damaged their fruit. The larger beekeepers removed their bees, the raisin producers had an almost total failure of crop, and the following year, the grape growers not only petitioned for the return of bees, but they kept bees in their vineyards, as it was proven the bees insure set of fruit and do not and cannot puncture sound grapes or peaches. Over-ripe and going-to-waste fruits may be and are visited by bees to save sweet juices going to waste. All com-

mercial horticulturists have proven insect enemies to fruit can largely be killed with poison sprays if applied at right time, which is just before and after open bloom. But a few, (not knowing better) insist on poison spraying open bloom, which kills the bees, as well as much of open bloom. In some states the fruit men spray open bloom with cold water in order to kill part of bloom, which is a way of thinning the fruit, so what matures will be larger. They know better than poison spray open bloom and kill the honey bees.

No person shall spray fruit trees while in full bloom with any poisonous spray which is injurious to bees in their egg, larval or adult stages.

If Wisconsin horticulture is to improve its products, it is as much the owners' duty to look after bees nearby, as it is to build up the soil or spray at right time.

The apple orchards of Wisconsin that won highest prize for quality at two World's Fairs (Chicago, Ill., Buffalo, N. Y.) had several hives of bees in the orchard.

The fruit bloom opens so early in the season, that there is not near enough other insects to fertilize the bloom, and it often happens to be bad weather, during open bloom time so the bees have limited time to visit so many flowers, unless hives are near the orchard.

Keep bees to insure more and better fruit.

DRUG PLANTS

PROF. E. KREMERS, Univ. of Wis.

> "* * * plants, herbs, and shrubs * * * of which this was choice, because of prime use in medicine; and that more choice, for yielding a rare flavor to pottage; and a third choicest of all, because possessed of no merit but its extreme scarcity."

The relative merits of the representatives of the vegetable kingdom growing in the monastic garden, as explained to Quentin Durward by the brother philosopher of Liege, when expressed in commercial values, are much the same today as in the past. The rare orchid is paid for at a price many times its weight in

gold and is placed under glass and in the care of an expert gardener. The kitchen vegetable, though the product of ordinary garden skill, must be wholesome, fresh and even attractive to the eye. Many a medicinal plant is seldom cultivated. It commonly grows wild on cheap mountain lands unfit for farming. Its collection, and its curing to a drug, are frequently left to ignorant people, with little or no sense of responsibility, who carry their parcel of roots and herbs to the market when in need of powder or spirits, the necessary elements of their shiftless lives.

The study of the fur trade constitutes a chapter of some importance in the history of the Old Northwest Territory. It is a chapter full of human interest and romance. To the summer tourist, who, away from the dock and the shops, has indulged in a stroll through the solitudes of Mackinac Islands; and who, instead of leading a life of luxury in the Grand Hotel, has sought the quiet of the old Astor Hotel, it does not require an overdose of imagination to see, with the mind's eye, the piles of furs in the counting-room of the former station agent, likewise the striking form of the *coureur de bois* and his Indian companions squatted about. Even the games of chance, played openly during the evenings in the equally open stalls along the lake front, and the sound of the distant orchestra may bring back visions of gambling, of primitive song and dance by the camp fires on the shores under the starry heavens and under the very guns of the fort.

The hunting of wild animals and the trade in their furs is a thing of the past in these parts. Few people—and this, I fear, holds true even of the historian of the fur trade in the Northwest—are aware that the hunting of animals has had its counterpart in the hunting of plants. Though not as important to political history, it also has had its charms and its romance (The Harvester).

While the hunting of wild medicinal plants has followed the hunting of those wild animals which were valuable because of their fur, both forms of hunting have had common aspects. Hence it is but natural that, to a certain extent at least, the very same type of people who had pursued the life of animal hunter, later, when the fur-bearing animals had been exterminated, turned to plant hunting, even though it was much less exciting.

Whether the hunting of either animal or plant proved very profitable to the hunter himself appears rather doubtful. The shiftless hunter was in the habit of selling out to the fur trader at the trading post, sometimes even in advance of the hunt. So with the hunter of medicinal plants. As a rule he never established connections with the manufacturer or even jobber, but sold out his small lots to the druggist and to the general merchant at the crossing of the roads.

In Wisconsin the succession of the fur trader by the dealer in roots and herbs is exemplified very strikingly in the Kickapoo Valley, a valley that derives its name from a tributary to the Wisconsin river, which joins the latter near its outlet into the Mississippi. The very names Prairie du Chien and Kickapoo have a flavor that smacks of the French *Coureur de bois* and his Indian allies.

At what time during the nineteenth century the collection of medicinal plants on a commercial scale in the Kickapoo Valley had its beginning has not been ascertained. Probably it began in a small way, as the fur trade ceased to supply even the meager wants of the shiftless squatter of southwestern Wisconsin. In the course of time, it must have acquired considerable proportions, though exact figures will never become available. Some idea of its extent, however, may be gleaned from the following figures. From 1893 to 1909 a single druggist in this district bought from root diggers and herb collectors in Richland and Crawford counties and exported the following amounts:

875,000 lbs. Red Elm Bark.
2,500 lbs. Blood Root.
2,250 lbs. Mandrake Root.
1,500 lbs. Elecampane.
1,250 lbs. Indian Turnip.
500 lbs. Prickly Ash Bark.
250 lbs. Goldenseal.
3,000 lbs. Ginseng.
1,500 lbs. Miscellaneous Drugs.

However, civilization even in the Kickapoo Valley is progressing. More intelligent farming, especially dairying, and more recently horticulture, have replaced the shiftless ways of the hunter-farmer by more scientific management. Moreover, the natural resources in medicinal plants had gradually been exhausted as the valuable fur-bearing animals had been annihilated before.

So long as the woods in central and northern Wisconsin sup-

plied in a wild state the roots and herbs which had disappeared in the southern tier of counties, there was little incentive to cultivate what nature supplies so lavishly. But even wild ginseng and hydrastis have become relatively scarce and hence the cultivation of these, as well as of numerous other medicinal plants has become an economic necessity and, therefore, a scientific problem.

For a long time small patches of peppermint, spearmint, sage, chamomile, etc., have been raised for home use, and small amounts have been placed upon the market. The only instance, however, of a medicinal herb grown on a large scale for a long period of years is that of the cultivation of wormwood and its distillation on the Drew farm in the fertile valleys of the Columbia county. This agricultural industry has been pursued by three generations on the same spot for over fifty years. Two other farms near the old Drew homestead have, in more recent years, taken up the cultivation of wormwood in connection with the raising of cattle.

The history of this industry is very interesting indeed, and not wholly devoid of romance and has had its problems for the sociologist as well as for the plant chemist. With this industry there was coupled, to some extent, the distillation of horsemint and several other aromatic herbs, though on a much smaller scale.

For fifteen years or more, the cultivation of ginseng has been a matter of some importance. As a purely financial proposition it has certainly paid handsomely in some instances. In Central Wisconsin there existed a ginseng garden in which $3.000 had been invested. After this first investment, the proceeds of the garden paid for both labor and improvements. The average profits during the nine years of its existence were 250 per cent per annum. Why was such a profitable undertaking abandoned you will ask. For the simple reason that the partnership was converted into a stock company.

Whatever may be the therapeutic merits of ginseng, this much is true, that the money value represented by the ginseng gardens of Wisconsin is not to be scoffed at. For the sake of mutual protection, including insurance against theft, the ginseng growers of Wisconsin have organized an association. A covered ginseng garden, spread out over several acres, with its hundreds of thousands of plants, all the way from yearlings to six-year-olds, is a

sight worth seeing. Indeed, it is so much worth seeing that in 1909 the Japanese government sent over two experts—one a scientific botanist, who had received his education in the universities of Germany, the other an expert in ginseng horticulture—to this country to study our methods of cultivation. The commercial significance of ginseng in Asia is such that the Japanese government has assumed control over all the ginseng cultivation in Corea and has secured to itself the monopoly of its sale. In this connection it may be mentioned *en passant* that ginseng was one of two articles which, in the early days of Kentucky, could stand the wagon freight from Lexington over the Alleghanies to the Eastern sea ports for shipment to China.

But aside from wormwood and ginseng, no systematic effort to cultivate medicinal plants had been made in this state, until a few years ago. The first attempt of this sort in Wisconsin appears to have been made by the speaker during the spring and summer of 1908. A year later this experiment was taken over by the government, which through the Office of Drug-Plant and Poisonous-Plant Investigations of the Bureau of Plant Industry of the Department of Agriculture for some years maintained its northern station on the campus of the University of Wisconsin as a cooperative experiment. In 1913 the Legislature established a Pharmaceutical Experiment Station, the first of its kind. It is this station, the research end of the Department of Pharmacy of the State University, which maintains its Pharmaceutical Garden as one of its several phases of activity to assist the pharmacists in their efforts to supply the best medicaments attainable. Its cooperation, however, extends to the Medical profession, indeed to all, who desire to assist in supplying aid and comfort to our sick.

EVERBEARING STRAWBERRIES

J. R. WILLIAMS.

My experience in growing progressive strawberries the past two years has convinced me that they are a profitable crop for the fruit grower if they are given the right care and have plenty of moisture.

They require a soil well fertilized as they have to develop a root system, the plant and produce a crop of berries the first year they are set out. I grow all my progressives under the overhead system of irrigation and for growing them under irrigation I prefer a sandy loam soil, a soil of which the surface will dry out in a short time after a rain; as a heavy soil dries very slow in the fall when the weather is cool and it spoils the looks of the berries and makes them soft for shipping. For growing progressives without irrigation I prefer a rich soil that will hold moisture.

My berries are grown in the hill system, rows are 2½ ft. apart and plants 12 to 15 inches apart in the rows. Fruit stems are kept picked off till about July 1st and runners cut off all summer.

Plants should be set early in the spring and cultivated once or twice a week and hoed often so as to keep a soil mulch around the plant. Keeping the soil moist, and a good dust mulch are the most important things in growing a good crop of everbearing strawberries.

It is more important to grow first quality fancy berries in the everbearing varieties than in the June fruiting varieties as most of the berries are sold to a high class trade that are willlng to pay 10 or 15 cents per qt. more for fancy berries.

My plants were weak last spring after the hard winter but we managed to pick 4,000 qts. from an acre. I believe with strong plants set early in the spring one can do much better.

I don't believe the everbearing strawberries will take the place of the June bearing varieties for the farm garden as there are very few farmers that will give them the care necessary to produce a paying crop. However, I do think for the fruit grower or gardener that will give them good care and plenty of water they will play a large part in strawberry growing in the future.

FRUIT GROWING IN IOWA

PROF. S. A. BEACH, Iowa.

I wish to ask the privilege of making just a few preliminary remarks before taking up the subject which your secretary has assigned me for the program. First, I wish to commend the splendid spirit of the little publication called, "Wisconsin Horticulture." I may say briefly that no publication comes to my desk which breathes a more earnest spirit of loyalty and patriotism, as well as presenting the technical side of the interests which it represents as capably as does this little publication of your society. (Applause.) I wish to add my expression of appreciation and of pleasure that you have a society so well represented in that little publication that comes out once a month to many people who do not attend your annual meetings.

I wish next to mention the exhibit of fruit in the corridors below. It compares favorably with the exhibit which was shown last month at the Mid-West Exposition at Des Moines. Some of the fruit that you have down in the corridor below is certainly high class. It is Wisconsin grown. It is well classified, well arranged, attractive, and shows what excellent products along this line Wisconsin is capable of offering to her own people and to people of other commonwealths.

The last time I visited your society the old capitol building was still with you, although it was surrounded more or less with uncompleted parts of this splendid new edifice in which we meet today. I cannot recall definitely how long ago that was, but as I look at your exhibit of fruit I can see that since that time you have changed the emphasis in your effort along the line of your fruit exhibits. When I was here before the exhibit was predominatingly a plate collection of varieties. I presume there might have been over a hundred varieties of apples on display and probably 75 to 90 per cent were varieties which you would not grow commercially. Moreover, many of them really were not as creditable specimens of fruit as they should be to be allowed a place in the society's exhibit.

In rather striking contrast with that exhibit is the one we see

today. The emphasis has been changed. The exhibit in the corridors below is predominatingly one of commercial varieties and along commercial lines, and is high class.

FRUIT GROWING IN IOWA.

Wisconsin and Iowa are part of the same kind of country, if you consider southern and central Wisconsin; if you were to take a radius of 500 miles with Madison as a center and let the line pass eastward from here into Michigan, then swing the radius around southward, westward and northward till the line touched Minneapolis, you would take in a sweep of territory which would include the upper valley of the Ohio, a portion of Kentucky and Tennessee, almost touch the Ozarks of Missouri, and taking in a little of the eastern part of Kansas and Nebraska. It would take in all of Iowa, and extend out as far as the Missouri river in South Dakota. That is a peculiarly rich and fertile region. It takes in a large part of the corn belt. To my mind, it is one of the most valuable agricultural regions on the face of the globe. It contains a population that from now on will be predominately American. I believe that when we get fully inspired with the spirit of the boys who are returning from the world conflict, we will feel with them that we have a great privilege and a great responsibility in carrying forward the work for which many of their comrades made the supreme sacrifice. It is for us to direct our lives and to work for those things which will make this the best country on the face of the globe in which to make homes, in which to bring up children and in which to develop the spirit of liberty and democracy, and loyalty to the best interests of mankind.

Iowa, as perhaps you know, lies between the two great rivers Mississippi on the east and the Missouri on the west. It is practically one great farm. Somewhere between 90 and 95 per cent of the land can be ploughed. It has a higher percentage of arable land than any other state in the Union. In the region which I have mentioned there is no part which rises above 2,000 feet elevation. It is one great rich agricultural region, in which animal industry and the production of farm crops predominate. In Iowa's agricultural industries, horticulture comes in as a minor consideration, but it is, nevertheless, an important consideration. Last year Iowa produced more food in quantity than any other

state in the Union and more than she has produced in any two previous years. The value of her agricultural products last year will run somewhere between $1,750,000,000 and $2,000,000,000, of which the value of farm forestry and horticultural lines of products, including landscape plant materials, florists products, truck crops and vegetables crops, sweet corn, potatoes and fruit, will doubtless aggregate somewhat over $50,000,000. That in general will give you a little idea of what significance these lines of work have in your sister state to the west.

Considering Iowa's fruit interests, I may say that the predominate fruit in importance is the apple. There are practically no commercial plum orchards in the state, practically no commercial peach orchards: there are some commercial cherry orchards and there are certain districts, notably the one at Council Bluffs, where they have a grape growers' organization for the marketing of their products, with a business which has now reached as high as $60,000 to $80,000 or more per year. But the apple is after all the predominate fruit of importance in the state as it is in southern and western Wisconsin and in the whole mid-west region above outlined.

If we should attempt to classify these orchards we could easily group them into three general classes.

1. **Domestic.** There is the *domestic orchard,* which is intended simply to supply the home with fruit.

2. **Commercial.** The *commercial orchard,* which strictly speaking is one which is the major source of income for the fruit farm. In fact, it may even occupy the whole farm.

3. **Farm.** The *farm orchard,* which is something more than the domestic orchard in that it is a source of some income, but on the other hand it is less than the commercial orchard in that it does not constitute the major source of the farm income. It is naturally to be expected that the strictly commercial orchard will be managed altogether from the standpoint of what is best for the orchard. There is no cutting and trimming of plans and policies imposed by the dominant demands of some more important line of work. The case of the farm orchard is different. Doubtless it is speaking within bounds to say that the great majority of them are not managed wholly from the point of view of what is best for the orchard. In fact, to such an extent is this the case that many farm orchards are a liability instead of an

asset. It becomes a pertinent question whether the owner would not be money ahead if he should clear the land of trees and use it for some other crop. The neglected farm orchards hurt the fruit growing industry. Not only do they constitute a liability to the owner, but they are an actual detriment to the apple growing industry of the state. Taking the state as a whole, the grade of fruit sent to market from such orchards is usually unsatisfactory. It lacks uniformity in size, in color and quality. It is wormy and scabby. Whether it is sold in bulk or in barrel, it ordinarily gluts the market with a low grade and a low priced product which results in lowering the price of the choice and fancy grades until the markets are cleared of this lower grade fruit.

This is, perhaps, the most important problem in fruit growing which confronts the Extension Departments in the agricultural colleges of the midwest. It is time to meet this situation. How are they to induce the people either to grow better fruit and market it in better condition, or to take out the trees and give the land to other crops, leaving on the farm only enough trees to supply the family. Thirty trees are enough for that purpose. We believe that we are doing a good thing both for the fruit growing and the other farming in Iowa when we urge the farmers not to plant more than 30 trees for the home orchard and if they go beyond that to plant enough to make it an object to take good care of them.

SPRAYING.

The extension department of Iowa State college has put a great deal of study and effort into working out this question of interesting the farmers in better orcharding. Under our conditions, we are finding that generally the best thing to do is first to interest the owner in spraying. We hold pruning and spraying demonstrations in farm communities. Sometimes it is through first arousing interest in pruning that the owner becomes interested in spraying. But regardless of the way in which active interest in the subject is aroused, we regard spraying as the entering wedge for improved apple growing. The reason for this is that without spraying it is impossible to produce sound, clean fruit, free from insect injury and fungous attacks. With spraying it is possible to produce fruit of higher grade in which the

owner can justly take pride, and in which he always does take pride. Having good fruit to sell he begins to take interest in better care of the orchard and of the fruit, also in better packing and in marketing so that he may get the returns to which he is justly entitled by reason of the high quality of his crop.

PRUNING.

Once a man becomes interested in spraying, good pruning comes logically as the next step, for these reasons:

First, efficiency. It is easier to do a good job of spraying after the superfluous brush has been removed from the tree.

Second, economy. Taking out the water sprouts and other superfluous growth reduces the amount of leaf and twig surface and consequently less spray material is needed.

SOIL MANAGEMENT.

The next logical step in the development of the owner's interest in better fruit growing is the adoption of right methods of soil management. Systems of rotation in the use of tillage, cover crops and clover sod are often recommended; also a study of the needs of the soil as to manure or other fertilizers is made. The owner is ready to put money into these things when he sees good prospects of getting a very high per cent of income on capital so invested. He is then better prepared to take up the question of fertilizers. To those of you who are interested in orcharding in Wisconsin, I wish to remark that this is a question of importance and worthy of attention in commercial orcharding. The matter of giving occasional dressings of stable manure for the commercial orchard, or perhaps supplementing the plant food in the soil by the use of nitrate of soda or some other form of commercial fertilizer should be carefully studied.

I have in mind an instance recently given me by an Extension Professor of Horticulture in Ohio this past season, of his experience in one case down in southern Ohio where the land is pretty thin and the trees are grown on rather poor soil. He took up some demonstrations in the use of commercial fertilizer, leaving certain trees untreated, so that they could make comparison between the treated and untreated trees. From the trees that were not treated he got about 7 bushels to the tree. With those that he treated with commercial fertilizer early in the spring, using

nitrate of soda, in two different applications, one about the time the growth started, and the other two or three weeks later, he had doubled the production. That is, he got about 15 bushels to the tree. I will leave it for you to figure out the rate of interest on the money invested in the commercial fertilizer. For an outlay of 25 cents per tree for nitrate of soda, the treated trees gave returns of $25.00 per tree more than the corresponding trees which were not fertilized.

FEWER OFF YEARS.

After the owner of an orchard has gone so far as to adopt the practice of spraying thoroughly and at the right time, and of pruning so as to make spraying easy and of managing the soil from the standpoint of getting results in more and better crops, he may be regarded as a permanent accession to the ranks of good orchard men. One of the remarks frequently heard from such men is to this effect: "It used to be that we never had apples except when everybody in the country had apples and the markets were glutted; now we have apples in the off years; our neighbors come to us to buy; our fruit is sound, well grown, keeps better, can be held in storage better, and for these reasons can be sold to much better advantage."

SIZE OF THE COMMERCIAL ORCHARD.

One of the interesting developments in this work is that men with small orchards, as well as those with large orchards, become interested in growing good fruit. Let me give a few illustrations from our own experience along this line.

Mr. A. has an orchard of about four acres. There are some vacancies leaving less than three and one-half acres actually in trees. There are about a dozen varieties, which is two or three times as many as should be included in a commercial orchard. Several of them are only second-class varieties. The orchard has been in pasture and the trees are still in tough old sod except as this has been loosened by a recent application of manure. In the spring of 1915 we were able to interest Mr. A. in putting on a pruning demonstration in his orchard for the benefit of himself and his neighbors. This resulted later in his deciding to put on a spraying demonstration. The whole orchard was sprayed

with the exception of a few trees which were left as checks. The result was a crop which returned him between $300 and $400. Previous to that time the orchard had done little but supply the family with fruit except one year when there was an abundant crop in all that region and when he could get but little for his apples. The next year, 1916, the spraying and pruning was repeated and the orchard was manured. His crop returned him between $600 and $700 besides the fruit which the family used and that which was given away. He is finding this little tract of three and one-half acres the most valuable area on his farm of over 200 acres of good Iowa corn and alfalfa land. He is now contemplating planting another orchard.

Mr. B. has a three acre orchard of five varieties. He also has a large farm. He determined to spray in 1916 although he had to hire the work done. It cost him $18. It cost him $60 to pick the fruit. He reports his net receipts from three acres for 1916 as $750.

Mr. C. has only one acre of good varieties of mature trees. He gives them good care. In 1916 his gross sales from that acre were $450.

Mr. D. has an orchard of five trees. This last season he got a sprayer of the "hand syringe" or "squirt gun type" and sprayed the five trees from a step ladder. As a result he got a good crop. He has had enough fruit for his own use, and March 1, 1917, had several bushels left in the cellar, besides having sold fruit to the amount of $18.50. It is clear therefore, that the farm orchard need not be one of forty or fifty acres in extent in order to be of commercial value and worthy of care and attention.

Mr. E. has forty acres of farm orchard of good commercial varieties from which he reported in 1915 net returns of $6,000.

Mr. F. has a fine Jonathan orchard of twenty acres, trees about twenty years old. They received no care or attention except that required to pick and sell the fruit. The orchard is located on a farm of about fifteen hundred acres. He reports gross returns in 1915 from the twenty acres of $100. Mr. F. gets $5 gross returns per acre if it happens to be a bearing year. Mr. E. gets $150 net returns per acre and has fruit every year.

THE OUTLOOK.

I wish to say just a few words, if I may take the time, about the horticultural outlook. We hear a great deal about over production along horticultural lines, but if you make a careful study of the situation so far as orcharding is concerned, I am speaking now of the fruit trees of this region, you will find that the orcharding is on the decline, for various reasons. You take the commercial orchard districts of the west, which have been boomed for a decade of more, including southwestern Colorado and portions of Utah, Idaho, Montana, Oregon, Washington, and you will find almost no place where they are extending planting, and you will find a great many places where the trees are being neglected, or where they are even digging them out to devote the land to other kinds of farming. Not long ago I was talking with a gentleman who lives in the region south of the Missouri river and he stated that in the region extending south of the Missouri river in Missouri and Arkansas, 90 per cent of the orchard trees, were on the decline. We know that last winter was exceedingly hard on the peach trees in the eastern states and in very many cases the trees were not only badly injured, but were even killed in large quantities. Not only so, but the apple trees have been badly injured by the winter. In Iowa the old farm orchards are going out very rapidly. For the last five years, doubtless ten have gone out for every one that has been planted. At the same time the prices of orchard products have been increasing. In our state this last year even men who had inferior fruit found that people were driving through their orchards in automobiles and competing with each other for the privilege of buying that fruit and to such an extent that he had to restrict the amount of fruit sold to one person, so as to serve a larger number of customers.

I believe that the outlook is good for commercial orcharding today as based upon our present knowledge of horticulture, our present knowledge of varieties and their adaptation to the region, our present knowledge of good methods, of combating insects and diseases and of orchard management. I believe that today is a good time to plant. The midwest that I have spoken of forms one of the very best markets in the world. Iowa consumes all the fruit that she produces, or rather, she consumes a quantity equivalent to that; in addition she buys hundreds of

thousands of dollars' worth of fruit every year from outside the state. I imagine it is the same way in this state. The western grower has to contend with high freight rate to put his fruit in our markets at a profit. One man living in the city of Ames, Iowa, this year, where the State College is located, brought in from eastern Oregon a carload of fruit, on which he had to pay $1.10 a hundred freight. He had something over 900 boxes in the car and he paid over $580 freight; cost of selling brought the expenses up to practically $800. Notwithstanding that he got over $1,800 returns on the fruit and he cleared above selling prices and freight charges, over a thousand dollars. I asked him, "What would that fruit sell for in Oregon?" He said, "This year is a hard year there, we were hit by the frost and hail and this fruit could not be disposed of in eastern Oregon." I am simply showing that our markets in this part of the country are willing to take almost anything in the way of fruit and the man that goes in to orcharding; who grows the right kind of fruit, packs it the right way, handles it right, I believe can make good money on an orchard investment. Moreover, land values are going to increase so the men who put money into orchard investments have a chance to benefit from advance in land values. Moreover, the population of this country is continually increasing; the wealth of the country is increasing. About three years ago the country passed the one hundred million mark of population. In 1950 it is estimated we will have a population of two hundred millions. We know that this upper Mississippi Valley is bound to become not only populous, but to grow in wealth. It will become one of the very best markets in the world. I believe, Mr. President, that the outlook for commercial orcharding in this region, based on right prices, is at this time encouraging. I believe that an orchard planted today would become more and more valuable with the succeeding years if it is given the right care and management.

I thank you for the opportunity of meeting with the Wisconsin Horticultural Society again and I wish to say that we are pleased in Iowa to know that we have a body of earnest workers over here in this state who are interested in promoting the things along horticultural lines in which we ourselves are also interested.

DISCUSSION.

MR. ROE: I should like to ask at what time in the growth of a fruit tree do you apply the fertilizer?

PROF. BEACH: In applying nitrate of soda, the purpose is to stimulate the early growth of the buds in the early part of the season. Apply, just before or just after the buds are beginning to start green tips and then two or three weeks later. It is a quick acting fertilizer, the purpose being to give the fruit buds an additional amount of plant food.

MR. ROE: Would not that give too much shove to the foliage and cause the fruit drop?

PROF. BEACH: That is a question which I think should be worked out under your local conditions. I gave that example of the effect of the commercial fertilizer in the orchard in southern Ohio on various orchards simply as an illustration of the advantage of studying locally this method of soil management and of handling the soil fertility question. Personally, in most of our experiments and field demonstrations we have not been using nitrate of soda. We have been using stable manure. It gives plant food, and in addition it gives humus to the soil. This increases the capacity of the soil to hold moisture and makes conditions more favorable for developing foliage and fruit.

MR. TOOLE: Is it at all likely that promoting good foliage is likely to starve the fruit?

PROF. BEACH: It is possible to so stimulate the growth of the trees as to make them cast their young fruits, or their blossoms, instead of setting fruit. That can be done, but ordinarily it is not. Ordinarily, if you give the tree the plant food and the conditions it needs to make good growth, it can develop good fruit buds, provided it has reached mature fruit bearing age. Now, in the tree you have to a certain extent two opposite conditions. You have the vegetative growth of the tree which you see in the younger trees, but the purpose of that, if we may speak of a tree as having a purpose, it is to establish itself in the world and to make a rapid growth and it is turning its energies into making a tree. Now, after it has become more mature, the sap moves more slowly, you will find the plant food and the energy of the tree will then begin to be devoted to the development of fruit buds. Generally speaking, people make a mistake more on the

side of not giving sufficient advantage to the growth of the tree rather than of stimulating it too much.

MR. TOWNSEND: In Wisconsin it would hardly be practical to use nitrate of soda, unless it is used on sod.

PROF. BEACH: In my preliminary tests to see whether the tree would respond or not, I have used about 300 pounds to the acre, at that rate, where you have about 40 trees to the acre.

QUESTION: I would like to ask whether Prof. Beach would recommend nitrogen as fertilizer?

PROF. BEACH: I am glad you asked that question, because generally speaking, there is no one who has yet shown the ability to answer that question so well as the trees themselves. The commercial grower who is interested in this question of the use of stable manure or commercial fertilizer, should put that question to the trees themselves. I would not give all the trees in the orchard equal amounts of nitrate of soda and then try to make up my mind whether I got good results or not, but I would give a portion, say three or four trees, nitrate of soda and sulphate of potash or muriate of potash; I would give to another portion nitrate of soda and acid phosphate; again, I would combine the three. Those are the three principal, important ingredients, of the ordinary complete commercial. However, I will say, if you can get good stable manure, use it. Perhaps you can get it out of the Stock Yards of Chicago. In eastern Iowa I understand they are shipping manure from the Chicago Stock Yards, and in western Iowa from the South Omaha Stock Yards. If you can get good manure from the Stock Yards, even if you cannot get it in your own farm community, I have no doubt it would pay you abundantly, for the reason that that will increase the capacity of the soil to hold the moisture as well as add to its fertility.

MR. ROE: At what rate do you apply the manure?

PROF. BEACH: As I recall it, it was something like 8 to 10 tons to the acre.

MR. ROE: Would it not be better to use that same amount of nitrate of soda distributed in three or four different applications?

PROF. BEACH: Well my own judgment is that it would be better to apply it in the early spring, when the growth is starting, as I have indicated. If you strengthen the fruit buds at that time and get a good setting of strong fruit, if the trees need

it, I think it will be an advantage to use it at that time. However, I have used commercial fertilizer as late as June and seen excellent results.

QUESTION: Is it not true that we have been almost too much afraid of blight in applying fertilizer for vegetable growth?

PROF. BEACH: I have no doubt that is true, that we have been afraid of using nitrate of soda, afraid we would over stimulate the trees. There is danger in overstimulating trees in growth late in the season, because—I do not know how it is here, but in Iowa, before the first of March comes, the thermometer may drop to 30 or 40 degrees below zero and possibly may do that after a period of comparatively mild weather and if it does that late in the winter season after the trees have come out of their dormant season, you are likely to get injury; you are more likely to get injury if you have stimulated late growth, not simply on the twigs, but I mean injury to the wood growth of the whole tree. If it is not properly matured, you are more likely to get injury from late applications which stimulate late growth than if you use stimulating fertilizer early in the season.

MR. ROBERTS: In regard to Mr. Roe's applying this to three or four plants early, when the buds swell out, the reason for that is this, you are working principally to induce the growth of the spurs which are fruit producing spurs on the tree and we find when starting wood growth development early in the season, that these spurs which make growth from zero to one-half inch in length, make that growth within some ten to twelve days after that first break in the spring, so unless your fertilizer is on in advance of this first burst of growth, you lose on this so far as it affects this spur development. You have some leaf enlargement extending for three of four weeks, but the length of growth of your fruit spurs is completed in from ten to twelve days, often times five or six days after the buds first break out into growth in the spring.

MR. BEACH: You mean after the blossom buds are fully open?

MR. ROBERTS: No, from the time the blossom buds first begin to grow, we have in our conditions here, the leaves of the size of a squirrel's ear; next day it is ready for the pink spray, and next day it is in blossom, or at least the second day, and we have an extremely short rapid period of spur growth and we want our fertilizer on in bulk in advance at that time so far as nitrate of soda goes.

THE PLANT DISEASE SITUATION IN THE STATE

R. E. VAUGHAN.

In reviewing the plant disease situation in Wisconsin for the season of 1918 three things stand out prominently: 1. The general good health of our crops; 2. The intensive surveys that have been made for diseases of grains and potatoes; 3. The splendid cooperation in the work between the United States Department of Agriculture, the state agricultural department, and the plant pathology department and extension service of the University. With 180 million people facing starvation as a result of the great war we can be very thankful that Wisconsin is in a position to do her bit in "keeping the wolf from the door" of our Allies. Probably small amounts of our important horticultural crops will actually be shipped across the ocean, but they will play a part in releasing other food and in keeping up the morale and health of the home folks

"An apple a day
Keeps the doctor away."

Remedies for the control of plant diseases can only be intelligently applied when the nature and causes of the various diseases are known and the location where the diseases in question are of economic importance. Thanks to the researches of Professor Jones, Dr. Keitt, and others we are accumulating a fundamental knowledge of the nature and causes of such diseases as cabbage yellows and cherry leaf spot or "shot hole". Dr. Walker is aiding the onion growers in solving their problems and Messrs. McKinney and Richards are actively engaged with experiments on potato scab and Rhizoctonia.

During the summer of 1918 members of the plant pathology department traveled many hundred miles in the state observing the condition of the apples and cherries, potatoes, cabbage, and onion, and cereals of all kinds. Whenever possible, advantage was taken of the county agents and emergency food agents be-

cause of their intimate knowledge of the plant disease condition in the counties.

The Plant Disease Survey of the U. S. Department of Agriculture stationed a field agent, Professor Wright, in Wisconsin from July 1 to September 28 for the particular purpose of detecting the first evidence of any outbreak of late blight on potato. All other crop diseases were also reported upon by Mr. Wright. On August 13 a field showing a trace of late blight was found near Rice Lake, Barron county, and later several other fields were found in the vicinity. Through the able work and leadership of County Agent Cuff, Barron was well supplied with sprayers and spray material, and, when the warning was sounded all the spray machines were hauled out and put to work. The results at digging time were:

	Sprayed % rot	Unsprayed % rot
High ground	5	35
Low ground	18	50

Thorough spraying with Bordeaux mixture held the blight in check until the frosts of September killed the vines and the danger from blight was over.

The injury to potatoes caused by frosting is of much greater importance than it is usually considered. It is a matter of common knowledge that when potatoes are frozen solid they become soft upon thawing and are known to the trade as "leakers". However, when a potato is slightly chilled, a few degrees below the freezing point, there is no external visible indication of damage. It is only when such potatoes are cut open that the result of chilling is observed. They may show dark lines in the region of the vascular ring beneath the skin or a net work of discolored strands in the flesh. The discoloration is always more marked at the stem end than at the eye end of the tuber.

Cabbage diseases always claim considerable attention from the plant pathology department and I am pleased to say that the yellows disease, which a few years ago threatened to ruin the cabbage growing industry in the lake shore region of Racine and Kenosha counties, is now practically under control through the use of the specially selected strain, Wisconsin Hollander. There is approximately a thousand pounds of this seed available for 1919. Mr. W. J. Hansche, Route 4, Racine, handles this seed as he did last year.

Cabbage black leg, a fungus disease, has been found more serious this year than in any previous season when this crop has been under observation. Virulent attacks have been made on fields of Wisconsin Hollander as well as other strains and varieties. Some fields of Hollander and domestic cabbage were nearly worthless. Black leg came the nearest to producing an epidemic of any plant disease that was observed in 1918. The fungus causing black leg lives over with the seed and on old stumps and leaves so that two avenues of control should be considered: (1) sound seed, disinfected; (2) rotation of seed bed and field. Seed treatment will not be an absolute guarantee against black leg because some of the fungus threads may get down under the seed coats into the very heart of the seed beyond the reach of any disinfectant. Formaldehyde solution, 1 oz. to 2 gal. of water, for 20 minutes has been recommended for cabbage seed treatment but does not prove quite as satisfactory as corrosive sublimate 1:1000 which can easily be made up in small quantities from tablets obtainable at any drug store. There is, however, a very great promise of being able to use heat in disinfecting cabbage and other seeds according to preliminary results of experiments now in progress.

The use of the formaldehyde drip attachment on onion seeders was again successfully demonstrated in fields south of Racine. Mr. Piper, one of the large growers, arranged two 30-gallon tanks on his large 2-horse 6-row machine and treated over 40 acres. He was so thoroughly convinced of the value of this treatment that he left no check rows for comparison. However, we do know that a full crop was harvested this year from fields that in 1917 gave from half to two thirds of a crop because of smut. In a field where the smut trouble was very severe, check rows were left untreated. These gave 186 bushels to the acre while the field treated went 681 bushels, a gain of 495 bushels.

In addition to the extensive survey work that was carried on last year as a result of the cooperative relations established with the U. S. Department of Agriculture, there is now stationed at Madison in connection with the plant pathology department a branch laboratory of the Office of Cereal Investigations. Dr. A. G. Johnson of our department has been placed in charge of all the investigations on cereal diseases caused by fungi of the ascus and imperfecti groups. Furthermore, the U. S. Department of Agriculture, Office of Cotton, Truck, and Forage Crop Investiga-

tions, has detailed to our laboratory Dr. F. R. Jones, who is continuing investigations on pea blight, and Dr. J. C. Walker, who is devoting his time to finding ways and means of better controlling cabbage and onion troubles.

Cooperation, working together, is an important reason why Wisconsin is so widely and favorably known in the field of plant disease control and there is every indication that future results will equal if not surpass those that have been recorded.

MR. KEITHLEY: I would like to have Prof. Vaughn describe the appearance of the Cabbage Black on two-thirds matured plants.

PROF. VAUGHN: The chances are that the outer leaves will be slightly perforated and by the time the plant is two-thirds grown there may be development of some ash gray spots on the outer leaves which will be covered over by minute black dots. These plants will not grow as rapidly as plants that do not have the black leaf, because the trouble is primarily on the main root, and the chances are that in good seasons these plants will develop central roots above the point of greatest injury from black leaf. In poor seasons, like last year, the leaves eventually will all turn yellow and drop, but they will do that in any other plant from which you cut off the supply of water and nourishment from below. That is not simply an indication of black leaf trouble. This black leaf trouble is not confined to Wisconsin and Illinois. I was down in Iowa last year and we had it reported there and also in Michigan, Minnesota, Indiana and Ohio, it was nearest to an epidemic of anything we had last year.

PRUNING PRACTICES

R. H. ROBERTS.

The horticultural books of fifty to one hunderd years ago give directions and advice upon pruning the different fruit trees in considerable detail. In fact, they deal much more clearly with the art of pruning than is attempted by more recent authors. This is largely a result of the pruning practices having come from Europe where the culture of dwarf fruit had influenced the methods used.

As dwarf fruits were not a success in our climate and as it also became necessary to secure new varieties adapted to the new conditions, the early horticulturist in America was chiefly a nurseryman and propagator rather than a pruning artist. We have then, many of our earlier writers such as Downing, paying relatively little attention to the pruning problems, but giving more consideration to securing new seedlings and better varieties. As a result we get the advice from Downing to prune the trees but little.

As orcharding became more of an industry and there were numerous large commercial plantings, there was more of a tendency to develop and follow definite pruning practices. Consequently, the later writings such as Bailey's pruning book illustrate a new phase of pruning development in which a rather large number of pruning principles are outlined. These are based more upon careful observations of tree growth rather than being the result of definite experimentation. At any rate, some of these principles, or at least the interpretations given them were doubted by many. Consequently, they were the source of stimuli for much investigation upon the subject of pruning.

We have had then, during the last fifteen years, many Experiment Stations conducting rather extensive experiments upon pruning. These have generally been undertaken to answer such questions as the effects of different amounts of pruning, different times of pruning or an investigation of the question of the relative merits of summer and winter pruning upon fruitfulness.

This mass of work has greatly affected our present pruning practices. We may have forgotten that many of our present ideas upon pruning are rather new, as they have been lost sight of through adaptation. Some of these are:

(1) That all trees need pruning. Our recent work in Wisconsin would add the cherry to the list, although in many sections it is largely advised that this tree needs little pruning.

(2) Unpruned trees grow larger and bear earlier than pruned trees. It is necessary, however, to do some pruning because of its use in regulating the form of the tree.

(3) The so-called "open center" tree which was only rather recently accepted into general use, has already fallen from favor because of its weak tree head.

(4) The question of the time to prune, if settled at all, is about where it formerly was, that "you should prune when your knife is sharp". At least there seems to be little danger of winterkilling of growing tissue around the pruning wounds of fall pruning cuts.

(5) The results of summer pruning have been generally contradictory.

(6) The tree does not function as a unit.

(7) The results of pruning are rather local, that is, the effect of the cut is close to where the cut is made.

(8) Probably too much has been expected from pruning. It is merely one of the conditions which affect the general functioning of the tree in regulating this larger question for which all pruning of old trees is done, the formation of blossom buds and the production of fruit. These phenomena are affected by many factors and not alone by pruning.

Blossom bud formation depends upon the reserve food in the plant. This reserve food is affected by a number of factors, as the amount of leaf surface on the tree, the light in the tree, moisture conditions and soil fertility. In some of these, pruning plays an important part such as regulating the amount of top and thus changing the amount of leaf surface and largely controlling the light in the tree; in others pruning has little effect.

Apparently, then, we have probably already received the greatest benefit which can be expected from the older type of pruning experiments which have to do largely with different amounts or times of pruning. The new line of investigation is

apparently to be a study of the functioning of the tree. You need not be surprised if when we come to talk pruning, we discuss such things as the nitrogen relationship to blossom bud formation or the effect of the amount of tree growth upon the setting of fruit. The next addition to more definite pruning knowledge is apparently going to be secured by assembling the information which the chemists and plant physiologists have upon other plants and after testing this out apply it to our fruit trees. After we learn more of the functioning of an apple or any fruit tree, then we can interpret this information in terms of pruning and begin to give more detailed and accurate advice as to the type or amount of pruning, as it may affect the leaf surface, light in the tree, food storage and finally, this thing which we are working for when pruning, blossom bud formation. The future of pruning is bright, for we believe that it can be confidently expected that the investigations of the next few years will reveal things in connection with pruning upon which we can base advice that will mean a saving of dollars and cents to those who obtain their livlihood and pleasure from fruit trees in Wisconsin.

THE GRAIN RUST CAMPAIGN AND THE HORTICULTURIST

By S. B. FRACKER.

One of the big effects of the war was the realization it brought to America of the importance of food. Our problem had always been how to dispose of farm products instead of how to raise them. This condition had been rapidly changing in recent decades but so quietly had over-production given place to under-production that the new situation was scarcely realized. Even in 1914 the brewery interests, for example, were advertising the number of millions of bushels of grain they were using without benefit to the consumer.

The sudden realization of a world food shortage which came with the outbreak of war caused a marshalling of every force to prevent any possible waste. It was necessary to stop losses in production as well as waste in consumption. When it was realiz-

ed that a reduction in the wheat crop of 1916 from 1,025,000,000 bushels, the 1915 figures, to 636,000,000 bushels had taken place largely through the effect of a single preventible plant disease, the necessity of heroic measures was apparent.

Black stem rust of grain had been the cause of many serious losses to wheat, oats, barley, and rye crops now and then for decades. The most remarkable feature of these conditions was the fact that the remedy had been known for many generations. Two centuries ago farmers discovered that black rust did untold injury in fields adjoining barberry hedges. At the time of the Revolutionary war Massachusetts prohibited the planting of the common barberry but seems never to have enforced the statute. In 1865 it was definitely proven that the barberry rust was the same as that on grain.

It may seem strange under these circumstances that these bushes were imported so persistently into the United States. They originated in Asia but the berries proved popular in Europe and were brought into America by the early settlers. In Wisconsin they arrived in 1840 and sixty years ago were well established in Dane, Walworth, Winnebago, Manitowoc, Brown, Sauk, LaCrosse, Trempealeau and other counties.

The question of a campaign of eradication was becoming insistent three years ago after excellent results had followed similar action in European countries. Denmark lead the way and has not had a rust epidemic since the common barberries were destroyed. Many other countries followed suit. The United States last year, becoming the granary of the world, could not afford to lose a fourth of its entire grain crop from a preventible disease and began an eradication campaign.

The experiment station, and the state and federal departments of agriculture, joined hands. Thousands of copies of educational articles were published and reams of mimeograph letters were sent out. Park boards, state institutions and public officials set the example and owners of large estates rapidly fell in line. In Wisconsin over a hundred thousand sources of grain rust infection had been destroyed by the time the buds burst in the spring.

A canvass of all the larger places was begun and during the season every city exceeding 1000 in population was thoroughly covered. 95,221 shrubs were found, the owner's name was recorded and a second and third visit made to ensure removal of the bushes.

In twelve places in the state barberries had escaped from their usual location around houses and been carried by birds into the woods. In nine of these places all have been destroyed and progress has been made in the others. There are possibly other counties in which the barberries are numerous in the woods but such conditions are not proving as difficult to handle as was anticipated.

The horticultrual society can help during the coming season even more than during the past. The conspicuous and easily found plants have been taken out, but isolated and missed ones remain. Members can be of great assistance by notifying the department of any tall barberry bushes found especially along country roads. This campaign will be continued until not a shrub of the dangerous kind remains.

The part of the horticulturists in this work is especially altruistic. Farmers and grain-growers probably have fewer barberry bushes than any other class of people. Horticulturists trained especially in the appreciation of shrubbery, berries, and flowers, own or look after a large per cent of these plants. In destroying them they are making a sacrifice with little personal benefit. It must be sufficient to know that the sacrifice is for the common good. When the choice is presented "barberry or bread", only one answer is possible.

PRESIDENT'S ADDRESS 1919

N. A. RASMUSSEN.

We are assembled once more in annual convention this time with lighter hearts and brighter thoughts than we had a year ago for we know the war is over and the victory is ours. Those of us who have helped to win this glorious victory only by the sweat of our brow, who have not suffered the loss of dear ones should assume a greater responsibility and take a more active part in the welfare of our Society than in the past.

If we glance into the future we realize that our field of work is even larger than it was last year. The cry for more food again comes from over the water and we must stand ready to

supply the need; therefore our work on "War Gardens" or "Victory Gardens" as they are now called must be continued. This portion of our work alone requires considerable attention as we plan to reach either personally or through literature every family, city or rural, in the entire state.

The small fruit situation is more serious than most of us realize and I predict that the fruit census which is planned for next spring will show less than one-fourth the acreage we had five years ago and I have no doubt but that the 1919 supply and price will prove my assertion. As the demand for small fruit is steadily increasing a campaign for a larger acreage must be launched at once.

While the growing of tree fruit has been our principal vocation it still continues to be. Wisconsin cherries are known almost the world over for their superior quality. Any one who visited our State Fair last year will agree that we can grow as fine fruit as is grown any where. The trays of Wealthy, McIntosh, McMahon and Greening were of as rare quality as any apple ever placed on exhibition. Let us plan to make an exhibit of our fruit at one of the interstate apple shows and gain the credit due our State.

That our apple packing law is inadequate was discovered when our inspector endeavored to protect retailers, consumers and growers against misrepresentation and at my request our Secretary will attend a meeting of the officers of the National Horticultural Society to prepare a bill for a national apple grading and packing law.

In a local paper from one of our leading cities we note plans for planting fruit trees in the lawns and terraces for ornamental and shade purposes; in cemeteries we also note unpardonable errors in planting—Shall we go to the rescue?

Beautifying the home grounds, the planting of shrubs and flowers should now again receive more attention thus insuring the beauties and pleasures as well as the needs and profits.

More local societies should be organized as each of these adds strength to the State Society and through the local societies a community receives the greatest benefits from the State Society.

ANNUAL REPORT OF SECRETARY

F. CRANEFIELD

Peace with Victory! After the mightiest conflict of all ages, after the sacrifice of ten millions of precious lives and the maiming of millions more, after fifty-two months of agony for all the nations of the civilized world, fifty-two months of warfare characterized by brutality and savagery on the part of our enemies such as never before recorded even among savages, peace has at last been declared and we enter on a new world.

In this conflict the horticulturists of Wisconsin took no small part. We raised no regiments of armed men, we built no ships, we captured no cities, but we did fight!

We raised and equipped a food army of 100,000 men, women and children who fought no less selfishly, no less nobly than any others of the "home guards", "the army behind the army over there."

The Civil war added many bright stars to Wisconsin's flag. The Eagle Regiment and the Iron Brigade will not soon be forgotten and this great World War of liberation has brought to Wisconsin's banner stars no less brilliant.

Cantigny, Chateau Thierry, Cerges, Fismes, Verdun, Belleau Wood and the Argonne Forest, although names of foreign places, will none-the-less live in history and take their places in our school books along with Lookout Mountain and Gettysburg while the brave deeds of the soldiers of the 32nd Division will be forever perpetuated.

We who stayed behind may also claim some small share of credit and without further flights of fancy I shall attempt to tell you in plain words and figures something of the work done by the State Horticultural Society in 1918 toward winning the war.

Realizing the need of an early start we began the work of organizing the War Garden Work in January.

It was early recognized by the Board of Managers that one great fault in the 1917 campaign was duplication of effort by

various official or semi-official bodies and as the State Council of Defense was recognized as the head of war activities in the state our Board of Managers offered our services to the Council to act as a sub-committee having direct charge of all war garden activities in the state. (A copy of the communication forms Appendix A of this Report.)

This offer was accepted and our Society proceeded to act. The first step was to invite the co-operation of the department of horticulture of the University which was readily obtained. The next to outline a plan to be followed by County Councils, civic bodies and others in organizing the garden movement in all cities of 4000 population and over.

This plan, a copy of which forms a part of this Report as Appendix B, was elaborated wholly from a foundation furnished by Prof. J. G. Moore and is known as the Madison plan:

Now at the conclusion of the year's work it will interest you to know how fully this somewhat elaborate plan was carried out. This can be briefly answered by saying,—in full.

To begin with nothing and perfect an organization in 56 cities was no small task. The initial work was done through the county councils of defense and, to be brief, before the opening of the gardening season we were able to write out a list of Garden Committees and, most important of all, a list of Garden Heads or Chairmen in each of the following cities:

Green Bay	Sparta	Washburn
Chippewa Falls	Beloit	West Bend
Watertown	Stevens Point	Menomonie
Grand Rapids	La Crosse	Bayfield
Fond du Lac	Brodhead	Oconto
Kenosha	West Allis	Eau Claire
Marshfield	Waukesha	Ft. Atkinson
Antigo	Monroe	Sturgeon Bay
Neenah	Racine	Horicon
Superior	Cudahy	Oconomowoc
Appleton	Sheboygan	Berlin
De Pere	Burlington	Portage
Ladysmith	Milwaukee	Wausau
Kaukauna	Manitowoc	Merrill
Rice Lake	Ashland	Tomahawk
Janesville	So. Milwaukee	Kilbourn
Waupaca	Plymouth	

In the meantime the educational work was being carried forward:

Speaking dates were arranged in 46 cities and our worthy president with Prof. Geo. Potter and Mr. W. A. Toole undertook

to meet the prospective gardeners in these cities and talk to them. This work was most wonderfully successful as shown by the attendance at the meetings.

In the meantime seven circulars were prepared dealing with the elementary facts of gardening as follows:

No. 1. Getting Ready for the Garden.
No. 2. Seed Sense for Gardeners.
No. 3. Early Plants.
No. 4. Prepare—The Soil in the Seed Bed.
No. 5. Sowing the Seed in the Garden.
No. 6. Tillage is Harvest Insurance.
No. 7. Protect Your Garden.

Of these, Numbers 1, 3 and 6 were written by Prof. Moore, No. 7 by Prof. L. G. Gentner and 2, 4 and 5 by the Secretary.

These circulars were printed in editions of 70,000 copies each and sent to the garden heads for distribution. The expense of publication and distribution of the circulars was borne by the Extension Division of the College of Agriculture.

During the growing season our office was kept in touch with the garden heads through correspondence and circular letters of encouragement. Inspection of gardens in the different cities was attempted but accomplished only in part owing to the inability of the Secretary aided by the President to secure competent inspectors.

The members of the Gardener's Advisory Council rendered faithful and efficient service in many places.

A satisfactory summary of the work, expressed in terms of dollars and cents is impracticable if not impossible. Various reports have appeared from time to time estimating the value of crops grown in the home gardens of United States but from two years experience and the opportunity of seeing thousands of gardens I feel that all of these are merely crude estimates. It is not necessary, however, to reduce the results to figures to realize and know the value of the undertaking. Thousands of families in Wisconsin this year enjoyed for the first time fresh vegetables all season and are yet enjoying the fruits of their labors in stored and canned vegetables.

The indirect benefits derived from this work are beyond computation and it is unnecessary to dwell on them here. The benefits to horticulture in the state and nation and to our Society can be more readily seen. War Garden work has accomplished in

two short years what we have been laboring for as a society for fifty years.

We have talked and urged and pleaded for half a century for the home garden and met with but indifferent success. Now we should forget our disappointments and feeling of resentment against these people who would not let us help them to help themselves for did they not respond to the last man, woman and child to the call, "Food Will Win the War"?

While the garden work has absorbed a large part of the time and energies of our working force the established activities of the Society have not been neglected. Our trial orchards have been cared for as in other years and this work is progressing toward a successful conclusion as it appears to be the policy of the executive committee to complete, the trial orchard work now in progress without further enlargement.

Our State Fair exhibit has been reduced in size each year as the demand for it diminished until now we occupy only a booth.

The remaining activities of the Society have been pursued as in past years.

Acting upon the assumption that a report of this nature should consist of two parts, a looking forward as well as a look backward I respectfully offer the following:

Due to the untiring efforts of our organization commercial tree fruit growing in Wisconsin is now fairly well established.

Along certain well defined lines we can hold our own with any other apple or cherry growing region in the United States and this business with only gentle stimulus will expand.

In doing this, however, we have undoubtedly if unwittingly neglected another and not less important business, the growing of small fruits.

Slight investigation shows that the business of growing small fruits for market has declined steadily and rapidly during the past ten years. I do not mean to say this condition is due wholly to our lack of efforts in this direction. Other factors such as changed methods of farming, greater general prosperity both in cities as well as the country contributing to shortage of pickers, the reluctance of growers to engage in an undertaking involving much hand labor over a long period, have all been contributing factors.

Had we been wide awake, however, to this condition as to others which we have encountered we might have overcome these

conditions to a great extent. It is our duty now to proceed vigorously to remedy this condition.

There is also room in Wisconsin for the development of market gardening conducted on a broad and rational basis.

With these two lines of commercial horticulture developed equally with tree fruit growing we will have raised our horticultural standard to a point where we need not be ashamed of it.

TRIAL ORCHARD COMMITTEE

WM. TOOLE, SR.

Our party consisting of our Trial Orchards Superintendent F. Cranefield, and Orchard Committee L. G. Kelloog, William Toole and M. S. Kellogg met at Merrillan early Monday, August 12th. We visited the orchard at Whitehall on the County farm early in the forenoon and found the orchard well cared for and not suffering from dry weather, but the excessively wet spring time had interfered with spraying. Fruit did not show much injury from codling moth or scab. Several varieties were bearing well especially Duchess, Hibernal and Okobena. There was a surplus of Hibernal. The superintendent expressed a desire for late keeping apples as they prefer to use all they can on the poor farm. Cherries have proved a failure in this orchard so the committee recommended to fill out with Northwestern and Windsor. For some reason Wealthy has not done well in this orchard. It seems as if it would be well to plant Dudley to take the place of Wealthy as that variety seems to do better than Wealthy in some parts of the state and would fill its place for the same season. Spray material had been secured but the unfavorable weather had made the application impossible. We reached Eau Claire shortly after noon with the intention of going from there by auto to the trial orchard near Weston. Condition of country roads made it necessary to go by train to Menomonie, and from there we went to the Weston orchard by auto. This orchard had been sown to buckwheat for a cover crop. Orchard and buckwheat were in splendid order. We did not meet any one connected with the care of the orchard, but conditions told the same

story as last year: that here is a splendid orchard country one of the best in the state. The few farm orchards seen on the return trip to Menomonie indicated that trees grow and bear well. The prevailing custom is to plant too closely. The crops along the route indicated that there had been an abundance of rain there through the summer. While harvesting was all over in south central Wisconsin they were busy here with the last of the grain cutting. The return to Menomonie indicated that the best route to or from the Weston orchard is by way of Hatchville a little four corner hamlet where the corners of Pierce and St. Croix counties join with the western line of Dunn county. We returned to Eau Claire with the expectation of going by auto next morning to visit the Holcombe orchard. Heavy rains through the night compelled the decision that the trip to this orchard must be made at some future time so it was decided to pass on to the Douglas county orchards as soon as possible. The first train available landed us in Superior late Tuesday night. During the forenoon we had opportunity to inspect Eau Claire war gardens, guided by Major Henry. I will venture the opinion that Eau Claire leads the state in extent of war garden work and production in proportion to population. From Superior to Poplar is a short ride by railway and we met Mr. Peterson, the owner of the orchard grounds in good season. The orchard had been well cared for through the season and several varieties were bearing heavily notably; Duchess, Hibernal and Okabena.

Where there is a surplus of Hibernal that variety is not appreciated as it deserves. It is all right for cooking, and if grown for that alone it is worth while where other varieties fail. There had been some blighting on McMahon and there was a fair crop of that variety. To make a comparison of varieties would be only a repetition of some parts of last year's report. The time is approaching when there should be a careful summary made of the adaptation of kinds to existing conditions in this and the Maple orchard. Soon they will have offered the lessons to us which should be placed on record.

Mr. Peterson took us to the Maple orchard, fed us and landed us safely in Superior. The Maple orchard has been well cared for the past season. Buckwheat was the cover crop. Some varieties were bearing better than last year, others not so well. In one row were a number of off varieties which had been planted

for testing. Two varieties made a good showing and one seemed very desirable.

Here in the north part of the state grain cutting was just commencing, as we could not leave Superior for Manitowoc before evening we had an opportunity to inspect the Superior war gardens. The Superior people had gone extensively into war garden work, potatoes were their leading crop, potatoes and beans were the leaders in Eau Claire. In both places the people gave attention to the more particular garden vegetables in their home gardens. Garden peas in Superior gardens were in full bearing, and giving a splendid yield. Potato fields were refreshingly green and did not show any evidence of leaf hopper, beetles or blight. A night ride to Manitowoc brought us to that place in time for an early breakfast Thursday morning.

We found the Manitowoc orchard in as good shape as the season's weather had permitted. Excessive wet in the spring had made spraying and cultivation impossible. Later, in July and early August the ground had been plowed to prepare for a cover crop but the ground was so dry it had turned up in great clods which to that time could not be subdued with the harrow. Trees, were in good order and had been carefully pruned. There was a little more fruit than last year but not enough to be satisfying, MacMahon was blighting just a little. These trees are now large enough to give profitable yields if weather conditions become favorable.

We reached Milwaukee in time for a late dinner and then L. G. Kellogg brought his car from somewhere and took us to the Pewaukee orchard. Some cultivation had been given this orchard but not so much as needed. Shortage of help and unfavorable weather were the complaints of Mr. Steele who owns the orchard. While this orchard is not quite what it should be to date and is too young to show fruiting results it is good enough to warrant favorable expectations from careful management from now on. Friday morning we went by rail to Springfield, Walworth county, and were met there by Mr. A. Martini who took us to the trial orchard at Lake Geneva, on the grounds of Mrs. Hatch. Again we can report good care of this orchard. Several varieties were bearing well, notably Duchess. Mrs. Hatch reported another good crop of cherries, and it seems as if cherries might be a staple and dependable crop in this section if people care to grow them. We can give only good reports for this or-

chard. It has been an object lesson of encouragement to the people of this part of the state. The orchard is now far enough advanced in production to make it desirable to soon put on record the lessons that could be learned from it. A return trip via Milwaukee took us home again.

THE BARABOO ORCHARD

This orchard on the Ski Hi fruit farm owned by Mr. A. K. Bassett, was inspected by a portion of the committee at the time of the summer meeting in Baraboo, August 22nd.

The orchard is being well cared for and doing well. The trees are too young to give fruiting results, but are nearing the bearing age and soon will give material for interesting reports.

GAYS MILLS ORCHARD

The full committee met at Madison, Oct. 3d, and proceeded via C. M. & St. P. Ry. to Boscobel. After dinner we drove with auto across the river and over the hills beyond to the trial orchard on the bluffs overlooking the Kickapoo valley. Fruit lay on the ground under trees of some of the farm orchards on the way. Before reaching the trial orchard we passed by a number of the commercial orchards which have been planted in the vicinity of the trial orchard. These orchards have been mostly well cared for and no doubt will give good results for the investment. Mr. Hayes was attending the fair at Gays Mills as superintendent of horticultural products, so he depended on the appearance of the trees for information. Many bushels of N. W. Greenings stored in one of the buildings ready for packing made a grand showing. The apples were very large and unusually free of blemishes.

Under the trees we found occasional evidences that the McMahon, Newell and Tallman had yielded fine specimns of fruit. This orchard is telling a good story for apple growers in that section of the state. McMahon showed but little evidence of blight. The cherry trees near this orchard and also in younger plantings in another place indicated that cherries may be successfully grown here. The vineyard makes a good showing of vines but fruit had been all gathered. We visited Mr. Hayes at the fair and found him busy helping exhibitors to close out the show. We may soon be looking for summarys of results of this orchard.

THE IOWA MEETING

W. J. MOYLE

As the Wisconsin delegate to the fifty-third annual convention of the Iowa State Horticultural Society, I beg to submit the following:—

Iowa is some State and Des Moines some city. The Mid-West Horticultural Exposition was a decided success as far as exhibits and program was concerned.

The Iowa horticulturists like the Iowa people, taken as a whole, are the most advanced and best developed type of civilization produced on this earth. Consequently they left nothing undone that would help put through a Horticultural exhibition worthy of their great State.

A great display of apples well arranged was the attractive feature, and it tickled me to see Minnesota and Iowa running neck and neck for the blue ribbon on the best display of that greatest of all apples, Wealthy. Iowa won out but it was a toss up between the two, Clear Lake in northern Iowa having the honored distinction of growing the finest Wealthies in the world the past season.

This show was truly an exposition as everything allied to Horticulture was well represented. Here under the same roof was to be seen a beautiful floral display, practical demonstrations of spraying and pruning under the supervision of Prof. R. S. Herrick of Ames, Ia. A man who is decidedly practical and enthused with his work.

Nurserymen's goods were well displayed. Tree protectors, apple graders, fungicides and spraying machinery.

Prizes were awarded for the best specimens of our native nuts, which brought out a fine showing of walnuts, butternuts, hickory nuts and chestnuts and other less important varieties.

Vegetables held their own and were an attractive feature of the show. The war garden displays particularly, were very interesting. But when it comes to potatoes, Wisconsin had to step on the toes of our Iowa brethern. We couldn't avoid it no matter

how polite we tried to be; so to make a long story short we cleaned them up on spuds, getting the lion's share of the ribbons.

Nebraska put up a good show of edible tubers but they lacked the well known finish and varnish of our spuds produced by coming in contact with the stumps and sands of northern Wisconsin.

Secretary Green presented us with one of the finest horticultural programs we ever listened to. Many important topics were under discussion and the most advanced investigators were present to freely impart their knowledge.

Our only regret was that on account of the "Flu," the attendance at the sessions was small and the meeting place as is often the case was inadequate. The quality of these papers and talks deserved a better hearing than they got.

One of the most interesting features of the exhibition was the display of hybrid seedling apples produced by Mr. C. G. Patten of Charles City, Iowa. Mr. Patten and his work is well known among our numbers and it was with pleasure we tested out some of his hardy hybrids and pronounced them of the finest quality. Mr. Patten well deserves all the honor and credit that has been given him by the horticulturalists of the Northwest.

Practical demonstration in domestic science in the art of canning fruits and vegetables were of daily occurrence, conducted by the war conservation commission of Iowa.

And last but not least, while strolling down the streets I dropped in and inspected one of the largest and most up-to-date Municipal Markets to be found in the country. The Superintendent and his assistant were very friendly and gave the writer many points on where improvements could be made if the large and commodious building, now provided by the city of Des Moines was to be rebuilt. Here we found a great Public Market; buyers and sellers coming and going all the time where everything under the sun was bought and sold.

Wisconsin State Horticultural Society

Summer Meeting, Baraboo

HOW TO CAN APPLES, TOMATOES AND CORN

By MISS MABEL J. MCBAIN

Every householder who aids in the preservation of food through the canning of the surplus, who intelligently handles the consumption of food, or who helps in the production, is aiding in no small way in the Nation's welfare. Food preservation has come to be a national challenge, and it is very gratifying indeed to see the response that the American housewife is making to the policy which our food administration has been setting forth.

However, if foods are to be preserved successfully, we must have a little scientific knowledge as to the principles which underlie the spoiling of the food. Our grandmothers found by experience that when they cooked fruits and vegetables and sealed them in airtight jars, they kept very well. She made frequent trips to the cellar and sorted over her fruit during the winter, and if she found that only half a dozen or a dozen jars had begun to work, or had spoiled, she considered her year's work of canning very successful. In the light of our present knowledge and with all the sources of information available, we as canners today should feel ashamed to acknowledge the loss of even one can of fruit.

The chief reason for the spoiling of food is due to the presence in or on food of tiny living organisms: Although we are not able

to see these bacteria yeasts and molds without the aid of the microscope, we know they are present because of the products of their growth. For instance, the production of gas in our jars of fruit, or the mold on bread, or the odor of decaying meat. Since, we know that bacteria are present and the conditions under which they grow to best advantage, we can check their growth by supplying adverse conditions. Bacteria grow best at a temperature of about 90 degrees, mould thrives at from 65 to 90 degrees. If then, we can take away this temperature by putting our foods in the ice box, or putting them in cold storage, or even freezing, we are checking the growth and prolonging the life of the food for a certain length of time. If we can kill them entirely and then prevent the further entrance of bacteria, we can keep the food indefinitely and upon this fact we base our principles of canning.

Some bacteria produce and grow by means of forming little hard shells around themselves, and in this stage they are said to be spores. These spores, encased as they are in little hard shells, are very resistant to even high temperature, and if we have spores in our jars of fruit which we are sterilizing, we will find that unless we sterilize for a longer length of time, we will not kill these spores. The intermittent or fractional sterilization method is based on this fact. The cans in which fruits or vegetables are packed are put in a sterilizing outfit and allowed to steam for an hour. Set aside at room temperature, these little spores develop into active bacteria again. In the second period of sterilization these active bacteria that developed, are all killed. The third sterilization kills any other spores which may have developed during the period intervening, and insures the sterilization of the product.

We have one other method of sterilization which is called the single period. In this method we sterilize for a longer period of time, about three hours, or 180 minutes. Although this is not quite as sure a method as the intermittent, it has so many other advantages that we have come to use it to the exclusion of the latter. This cold pack single period method insures good flavor and good texture of the product, is very simple requiring one handling of the jar, thus saving time, labor and fuel. In the canning of all our vegetables this year, because of the fact that it is so necessary to conserve fuel, we have adopted this cold pack method of sterilization.

In order to can successfully it is necessary to have good equipment. The jars used need not be of any particular type, but should be thoroughly inspected and tested. Rubbers may be tested by folding and pinching with the finger, then turning the other way and pinching again. A good rubber should not crack, even if pinched two or three times in the same place. The color of the rubber makes no difference in the quality. Red rubbers are thought by some to be preferable; the red is merely a dye. We should always have new rubbers in starting our canning.

Then we must have some sort of sterilizing outfit. There are three types in general use. The one which is the most practical for home use is the home-made hot water bath. For this a wash-boiler, large enamel preserving kettle, or even a new garbage can may be used. It is advisable for the housewife also to have a rack by which the jars can be easily handled. One of the greatest hardships in canning is the handling of the hot, heavy jars. There are a good many forms of racks which can be purchased very reasonably now, which lift the cans from the bottoms and prevents the breakage of the jars. They also allow the water to circulate freely around the bottom of the water bath which is a necessary thing for thorough sterilization. It speaks very well for the canning which has been done in this city to say that there are only two types of racks left. All suitable for use in wash-boilers have been sold. The prices range from 10 to 90 cents. Packs may be improvised very easily by taking two strips of wood and nailing some laths across. Be sure that the rack is deep enough, so that there will be a free circulation of water underneath.

Then we have steam cookers; a good type of which is the Toledo steam cooker. Its advantage is that you are able to use it in cooking at all times during the year. You can cook whole dinners in a steam cooker, using one burner thus saving a great deal of fuel. There are two types of steam pressure canners. One which is suitable for farm use and community work where a great deal of canning is to be done, costs about $18. It is very heavy, weighing about 60 or 70 pounds, therefore not quite so practical for the house wife. Then we have one in aluminum which costs more, but which can be used daily for cooking coarse vegetables, and tough meats. The Northwestern Steel and Iron Works at Eau Claire, Wisconsin, make such a type.

An alarm clock is a great convenience in canning. You can

put your food into the water bath and set your alarm clock to ring at the end of the period of sterilization, then go about your work without thinking particularly of the time.

Then we need a kettle for blanching purposes, a teakettle full of hot water to pour over the food, and our tested jars and rubbers. The cold pack method is the one which we are all accepting and using. In canning vegetables, one important thing is, that the vegetable should be canned as soon after picking as possible. Some vegetables develop in a very short length of time a fermented condition that is known as flat sour. For this reason they should be canned within three or four hours after picking. In order to accomplish this you should not undertake to can to many jars at a time. Do them in small quantities, unless you have some one to help you. After the vegetable has been cleaned and prepared for canning, very much in the same way that it would be for table use, put it through a process that is known as blanching. Blanching does four things. It takes away strong odors and flavors; removes certain excess acids, which we do not care to have in the canned product, improves the texture of the vegetable and reduces some vegetables in bulk. Greens in particular need to be reduced in bulk, because they shrink so much in cooking. If we did not blanch them first, we would then have a great deal of waste jar space.

Blanching is done by putting vegetables into sacks of cheese cloth or other cloth for the purpose of easy handling, and plunging them i nto boiling water for about 15 minutes, depending upon the kind of vegetable which is being canned. Greens are preferably blanched with live steam, to avoid throwing away any valuable mineral matter which dissolves out in the boiling.

After the vegetables have been blanched, we are ready to cold dip them. This stops the cooking and makes the handling and packing easier. Vegetables should not be allowed to remain in the cold dip for more than a minute. If they remain too long, they become water soaked. Then we are ready to pack. Have the tested jars hot, thoroughly cleaned and wrapped with a hot cloth, or standing in a pan of hot water. This is done to prevent the breaking of the jar when you put it in the hot water. Pack the vegetables in as carefully as possible, although you should not push them down into place too vigorously. In the case of string beans we desire to have them packed closely but not to have

pressed together so that the water will not circulate throughout the jar.

The jar should be filled to within ¼ or ½ inch of the top, seasoned by the addition of a teaspoonful of salt to the quart, and covered with boiling water to overflowing. Adjust the wet rubber and the cap. If you are using a Mason jar, screw down to within one round; this allows the escape of steam and prevents the breaking of the jar. Put immediately into a processing or sterilizing outfit.

Since corn is one of the vegetables which is about ready to be canned perhaps it would be well to go through the steps in detail. It has been one of the hardest vegetables to can, probably due to the fact that we have not given it sufficient time for sterilization. The choice of corn is also of the greatest importance. It should be chosen when it would be best suited for table use. There are two stages; one is known as the milk stage, and the other is known as the dough stage. When at the milk stage, a milky liquid will press out if tested; when at the dough stage, a cheesy dough will come out. Corn for canning is best between those two stages. It should be canned as soon after picking as possible, and in small amounts at a time, unless you can work very quickly. The corn should be blanched in boiling water for a period of five minutes to set the milk, then cut from the cob with a thin-bladed, sharp knife, working from the tip to the bottom. At this point we need to work very quickly. It is better to have two people, one to do the cutting and the other to do the packing. If that is not possible, a person should cut enough for one jar, then put that into the processing outfit. The extra cooking will not make as much difference as the development of the flat sour condition will and this develops very quickly in corn. Pack the jar leaving one-half inch at the top. Corn is a vegetable which expands in cooking, rather than shrinks. Season with salt. Sometimes a little sugar is added, but a very small amount. Cover with boiling water, flavor, adjust the rubber and cap, as described before, and put immediately into the hot water bath. If you are using your home device water bath, have the water come over the top of your jar at least one inch. Then you are sure, when your product has been sterilized that you will have a full jar for there will not be any evaporation of water which will leave the jar a little empty at the top. However, if there were an air space at the top, that would not mean that your jar

of vegetables would spoil, because sterile air is just as good as sterile water.

There are a number of good combinations which can be made with corn. Corn and tomatoes canned together are very nice, using one part of corn to two parts of tomatoes. The corn is prepared by the method suggested above. The tomatoes are blanched for a minute and a half, cold dipped, skinned, cored, mixed with the corn, packed and put in the processing outfit. Another combination is that of corn, tomatoes and string beans in the proportion of one part of corn and one of string beans to three of tomatoes. The string beans are blanched and prepared in the same way as you would for canning them alone. Tables of definite directions should be followed, which may be obtained through our government bulletins, our division of Extension of the University of Wisconsin, our public libraries, and almost any of the current magazines, the Good Housekeeping and Ladies' Home Journal in particular. Field corn has recently been used for canning. It produces a quality of corn called corn club breakfast food. The corn is blanched for about ten minutes, and put through a food chopper, then cooked with a little butter and sugar until it becomes thick; and has a sort of cheesy appearance. It is then packed in a jar, allowing room for expansion, and sterilized in a water bath for a period of 180 minutes, or three hours. This can be sliced, toasted or fried for breakfast food. It makes a very delicious dish, and it is a good way of conserving field corn.

We are also ready to can tomatoes. Our tomatoes are not so hard to can, because of the fact that the acidity prevents the growth of bacteria to a great extent. We may can tomatoes easily and successfully by the open kettle or the hot pack method. In this method we cook our tomatoes down in the open kettle and then put them into jars, made sterile by boiling, for twenty minutes. We must be careful in sterilizing our jars to recognize the difference between sterilization and cleanliness. I have in mind one particular young housewife who sterilized her jars for fruit and tomatoes very carefully, but after the long-period of sterilization she noticed upon the inside of the jar a little deposit of lime from the water; she took her clean dish cloth and wiped it out carefully. She did not realize that the presence of one single bacterium would be sufficient to destroy her whole jar of fruit or vegetables. The open kettle method is perhaps the most prac-

tical way of canning tomatoes, because they cook down, and we do not waste any jar space. However, sometimes we desire to have tomatoes whole, which can be used in the winter time on specific occasions. In that case we can use the cold pack method to better advantage. For cold packing tomatoes, blanch a minute and a half, and cold dip as soon as possible. When the skins begin to break, take out of the cold dip and with a sharp knife skin and remove the stem. Pack into a hot clean jar and season with salt. It will be best to leave out the sugar, since we are conserving sugar these days. Fill up the jar with the hot strained tomato juice which has been made from culls and other portions of the tomato which have been cut off. Cap and sterilize for twenty minutes in the cold water bath. The acid helps in retarding the growth of bacteria. A good tomato puree may be made using two quarts of thick tomato pulp, one medium sized onion, two tablespoonfuls of red pepper chopped, some salt, one-half teaspoonful and one tablespoonful of sugar. This tomato puree may be made of small or broken tomatoes. Press the pulp through a sieve, discarding all the seed, add onion, chopped pepper and the other ingredients and cook until the consistency of catsup. It will be necessary to stir frequenty in order to prevent from scorching. Pour into jars, adjust the rubbers and tops and sterilize for 20 minutes in hot water bath. This puree may be thinned and used just as for soup, adding hot water or milk.

Then we have other ways of making our tomatoes into delicious products, ready for immediate consumption. For instance, the tomato chutney. Use ripe tomatoes of medium size, chop six onions, three red peppers, one dozen dried windfall or cull apples, one pound of seedling raisins, two quarts vinegar, three cupsfull of sugar, corn syrup or honey. Combine ingredients and cook until thick and clear; pour into hot, sterile jars and seal.

The subject of apples I believe is to be taken up later on so I am going to speak only of the canning of apples, listing the numerous uses which can be made of canned apples. They may be used as a breakfast fruit with cream and sugar; they may be baked or used as a salad; baked or fried with pork; used in apple pies, or in apple dumplings. The syrup may be used for pudding sauces or drinks. Windfall or cull apples should be graded before using. Those that are reasonably sound and you have reason to believe are firm at the core, should be put in the first

grade, those which are worm-eaten or partially decayed in a second grade. The first grade may be canned whole, and may be used for the breakfast dish or dumplings, or baked later on. In the preparation of the canning these apples should be washed carefully and blanched for about two minutes; cold dipped and packed into half gallon or gallon jars. Pour over them a syrup of thin consistency, because if we are using syrups at all these days, we are not using them in any greater thickness than thin consistency. Adjust rubber and cap, seal and sterilize in water bath about 25 minutes for large sized jars. For the smaller jar you would not have to sterilize quite as long a time. These apples keep very well through the winter, though they probably would not keep for a longer period of time than that. The apple may be baked later, and if it is baked it softens the skin, which in the case of some apples might be a little tough. Some varieties we find however to be very tender with only the period of sterilization cooking. Apples which cannot be canned whole may be quartered or sliced for use as a salad, or for pie filling. The color of the apple is retained, that is the apple is prevented from tarnishing by dropping it immediately after paring in salted water and then packing very quickly.

The method of sterilization for apples which you are going to can for pies would be the same as those which we can whole, except you would only sterilize them for a period of 12 to 16 minutes. The sterilization period begins when the water is rolling throughout the whole kettle. Apples for pie filling should be sterilized for 12 minutes in hot water bath. Pies made from these can be baked in seven minutes. That is quite a saving of time in the preparation of a dessert on a busy morning. The juice which can not be used in the pie should be saved and may be made a part of a drink, used as a foundation for a pudding sauce. These apples were canned without sugar, corn syrup being used in its place. Valuable fruit juices may be pressed out of cull apples with a press, or, if that is not convenient, may be extracted in the same way that you would extract juice for jelly making. These fruit juices are then boiled for about five minutes. If you desire to use them for jelly making later on, boil them until you get what we know as the pecten test. The pecten is that portion of the fruit which gives it its jellying power. Put the juice into a bottle and stop lightly with a stopper; put into a water bath so that the water reaches within an inch of the top,

and sterilize for 15 to 20 minutes. Then push your stopper down tight. If you are sure that it is going to be a good seal, you can tell by testing. If you are not sure, dip the whole top of the bottle into melted paraffine.

DISCUSSION

MR. TOOLE: I know people who spend a lot of time trying to make jelly that did not jell. I should like to know if there are any bulletins or any literature that we can get, like we can with regard to the cold pack.

MISS MCBAIN: The best jelly making bulletin is the one that is issued by the University of Illinois. Miss Goldthwaite is the author. She has made extensive experiments in jelly making and writes them up in her bulletin in an interesting way. I think you can get that by writing to the extension department at Urbana, Illinois.

QUESTION: Will you please tell me what other vegetable besides corn are subject to the quick starting of flat souring?

MISS MCBAIN: Peas are perhaps more susceptible than corn. Peas and corn are probably the two most difficult types to do. Both should be handled in small amounts to prevent their souring, and sterilized for the same length of time—180 minutes.

THE PRESIDENT: The asparagus is one of the best vegetables in our garden and it is neglected the most. It is almost impossible to get it and is very expensive when you can buy it.

MISS MCBAIN: There are some points that must be observed in the canning of asparagus. In blanching asparagus we generally tie it together in bunches about large enough for the can that we are going to use and then sterilize it for a longer period of time at the stems than at the tips. Blanch about ten minutes and then turn it so that the tips can blanch a shorter period. Loosen the string, pack and can in much the same way as other vegetables, following directions such as you would find in any of the bulletins.

QUESTION: Can string beans be cold canned?

MISS MCBAIN: I know that it has been done before the cold pack method was devised, but we are so much surer in using the cold pack method and in the long sterilizing.

Formerly it really was a question of the condition of the beans that we put in to a greater extent. In cold packing we are sure and it is not very much more work, so we all have adopted this method for that reason.

QUESTION: I do not see why you would blanch corn when it packs so beautifully without. There is no shrinkage to it.

MISS MCBAIN: The principal reason is to set the milk. Blanching is chiefly for the purpose of improving the texture and flavor. If you have good texture and flavor, you may do it according to your ideas.

CIDER MAKING

C. R. TUTTLE, Baraboo

Cider is made for two purposes—for vinegar and drinking and cooking.

Sweet cider intended for drinking purposes, should be heated to the boiling point for a few minutes and then placed in air-tight containers while hot and without sweetening.

Boiled cider is made by reducing cider to a consistency of five gallons to one, but may be modified to suit the use and taste of the customer.

In making sweet cider or boiled cider, the cider should be cooked as soon as pressed. Do not attempt to cook cider that has been allowed to stand for even a short time. Freshness and cleanliness are absolutely essential in making a perfect cider.

Cider Vinegar—The important and essential process in the manufacture of vinegar is fermentation. To make vinegar from cider, it must undergo two distinct fermentations. First, the one forming alcohol from sugar, being called alcohol ferment. The second—the one forming acetic acid from alcohol, being called the acetic or vinegar ferment.

In the fermentation of cider, heat plays a very important part, both in the first and second fermentations. Uniformity of temperature is essential. Care must be exercised, therefore, to avoid sudden and extensive changes.

When the cider comes from the press, it should be run into fermenting tanks where it changes into alcohol. As soon as the

alcohol ferments start to work to produce alcohol, the acetic bacteria attack the alcohol and convert it into acetic cider.

At home fill the barrel or cask and place it in the sun on the south side of the building. Be sure to put in the cellar before freezing weather. A warm cellar or furnace room is best.

It will pay anyone having a large orchard to have a small vinegar generator, or take their apples to a cider mill where there are vinegar generators for the quick process or manufacture of vinegar.

Acetone, manufactured from powder, also for treating the acetic acid is used for making of cloths used on airplanes and other uses.

HOW TO MAKE APPLE BUTTER

C. R. TUTTLE, Baraboo

Of all the products of the apple, Apple Butter pleases the most people, especially the children. A small boy was overheard to say, "I like apple butter better than butter." When asked why, he replied, "because you let me put it on thicker."

This delicacy is much in use in the older apple growing sections of the country, and becomes almost a necessity wherever known. Apple Butter is easily made and as inexpensive as any other apple product.

In the mill I use good, sound apples, after washing them in clean water, they are run through the apple grinder, then placed in the cooker with six or eight gallons of fresh cider for four bushels of apples.

This is cooked by steam about forty minutes, or until cooked to a thin sauce, then passed through the colander, which removes all stems, skins and cores. The sauce is then returned to the cooker and one quart of heavy boiled cider, one pound of sugar and one-half ounce of cinnamon, or other spices is added to each gallon of sauce, which is then cooked to a consistency to suit.

About one-half sweet and sour apples or all varieties of apples mixed, make the best apple butter. Spices should be added after the cooking is done.

DRYING FRUITS

By MR. J. H. PROST

Drying is one of the ways of preserving food. We have not been eating enough vegetables in this country and we are just beginning to realize that we have not. We are beginning to realize that we can live on vegetable food in preference to meat, nitrate foods, and live healthier, be more active, feel more agreeable, and we are going to learn this lesson. We eat at least three-fourths more meat than is necessary, especially the people in larger cities. I would not say that that is true in every case in the rural communities, but in the larger cities we are beginning to overcome the necessity of living on meats, and we are beginning to develop a desire for vegetable food, and in Chicago this year, where I was director of the War Garden activities for the State Council of Defense, I met hundreds of families that last year grew all the vegetables that they needed for their home consumption for the entire year and will this year grow more than will be necessary to feed themselves. This vegetable food then is preserved in different ways for winter use. Storing is one of the very best methods of conserving our vegetables. If we have the space available, by all means give attention to storing your vegetables, learn how best to store them, and store as much as you possibly can. Another very inexpensive method, of course, is salting and pickling. Salting we do, or ought to do, a lot of, because when you salt your vegetables, such as kraut, beans, lettuce, etc., and pickle them, you can put them up in cheap, inexpensive containers, containers that you have available at home usually in large quantities. Pretty soon we will have a lot of barrels and kegs available for that purpose. In Michigan they are filling the beer barrels with sauerkraut, a mighty good transformation, and it gives them a container that costs practically nothing.

Drying is another method of preserving food.

You will be surprised to know that last year over $50,000,000 worth of dried fruit was sent across the water. This year it will probably be ten times that amount, because we are doing more

drying. The government has some commercial drying factories which are under its direct supervision, in addition to having several commercial establishments that are drying various vegetables in a commercial way. Rhubarb and pumpkins are two vegetables that are being dried in large quantities which will be used during the winter time by the restaurants in making pies. Just that one activity has made several companies independent. Your chairman just spoke of okra. Of course we ought to grow more okra, and we ought to dry it. It is one of the simplest vegetables to dry. Not only that, but I know women that are drying onion tops, celery tops, beet tops and carrot tops for no other purpose than making vegetable soup for the winter. We all need all that we can possibly save, there is no question about the food necessity. There is no question about food being the second or third essential thing in winning the war, and if that is true, we cannot give the food question too much time and attention.

So far as the gardening work is concerned, there certainly could not have been a greater response in any community than there was in our community last year in regard to war gardens. South Chicago, a place where nothing but smoke belches from factory chimneys, where mostly Slavs and Poles live, there are more than 1200 acres under cultivation, there are fully 5,000 families growing gardens on vacant land that was plowed and provided by the South Chicago Y. M. C. A.

Now, whether we wish to dry all varieties of vegetables is a question. You know drying food was one of the most primitive ways of preserving food for winter use, and it came into disuse because the average woman in the larger communities learned to stick up her nose at dried prunes and dried apples and some of the other dried foods, because the drying had been poorly done; the produce had been infested by maggots, it looked dusty and unclean, it had not been kept in airtight and clean containers, and the canned goods had been put up in just the finest, most showy cans, the display was always attractive, those people who started the commercial canning industry knew that their canned produce was more attractive, and that it would sell more readily than dried produce and they of course used their influence against dried food, but let me tell you that dried food contains as much, if not more, of the original nourishment of the vegetable, than canned food. It may change a trifle in taste, but if

properly selected and properly cared for and properly rehydrated for use, it will give you a taste that is almost equal to the canned produce. I understand that our boys that are across love nothing better than to chew dried apples, dried peaches, dried plums, and if you wish to do something for them now and then, send in a parafined package, such as I will show you, dried apples or dried plums and peaches, and see what sort of letter you will get in return. It is better than the candy or some of the other things that they are forced to buy in some of those out of the way places where they are now training.

The essential thing is to get the moisture out of the product. Now, there are different ways of doing that. Sundrying is probably the very best way, but sundrying takes a long period of time. Another thing, there is great danger of infestation from various insects depositing the egg in the produce. You can protect it by covering both above and below with a muslin cloth, and usually the sundrying is done where there are screens. You can also dry vegetables, those that are least watery, root crops, and especially apples, you can dry them in the garret where there is ventilation. There it is not always safe, because there is danger from contamination from mice, rats and insects, but if proper precaution is taken, and the place on which the produce rests sets on supports, you can protect your produce against mice, and by covering it, against insects.

The next most inexpensive way—I am trying to enumerate these methods of drying as to their expensiveness—out-of-doors sundrying is the least expensive, of course. Next is in the oven of the cook stove or range, leaving the door open slightly. You can dry your produce on plates or you can make a little screened tray. When the heat is turned off you can shut the door, and in the morning you can leave the door open and continue the drying. Then we have a number of little oven driers that are made of galvanized tin or iron, little squares with trays upon them, one of them, a very good drier, costs about $7, but I hardly think the average home needs to have one of these driers. There is a great deal of talk about the community drier. In my estimation the community drier is out of the question excepting in certain localities, because what we really want is to have the largest amount of food grown, developed and preserved in the smallest consuming unit. In other words, if every home can feed them-

selves, that it the ideal condition at this time. It will necessitate the least amount of overhead expense. In the community drier the material has to be carried back and forth, some one has to be there in attendance. If you are trying to dry over a gas stove, you ought to use something over your burners to regulate the heat, so that the heat will not go up directly to your tray, because there is great danger of scorching or burning your produce. But if you will lay a soap stone or two or three bricks over the flame, they will consume the heat and it will be radiated and that heat will then go up uniformly to your tray and you can keep your tray much closer to the fire. Then you can raise that tray up and hang a second and third tray under it. The average root vegetable will dry if hung over the stove in that way in 8 or 9 hours. It is better for you to take a little longer time and give it gradual, temperate heat, rather than put on an intense heat and endanger your produce. The temperature should run from 110 to about 150 deg. F. in this drying process, beginning with a lower temperature, running up higher, and then perhaps reducing again when the produce seems to be drying out thoroughly.

How to tell when the produce is dry is the question that is always asked, and it is rather difficult to answer. I say, never dry your produce until it is crisp, rather stop when it is leathery, when it will bend rather than break or snap, and I think in the majority of cases the produce is dried too long or too much, rather than not enough. Yet I have seen a lot of dried vegetables lately that still should have been put over a very moderate heat for a period of about an hour or more and well seasoned in that way and then returned to whatever the container was that it was put in Apples can be blanched by dropping in salt water. The heat should be uniform and even throughout the period of drying.

We blanch the root crops, also cabbage, cauliflower, Irish and sweet potatoes and peas and beans. I think that carrots, turnips and kohlrabi are all better if blanched, and I think all those staple vegetables should be blanched, boiled for about eight minutes, when cooled, dip them about one minute.

We can dry eggs, cottage cheese, milk and we can dry meats. In drying tomatoes you can take all the pulp out and dry the pulp, and that can be retained for soups. In drying strawberries and grapes you can extract the juice and dry it, and you will

get a powder that, when you put water into it and it dissolves, you get in the wintertime a very excellent juice that you can use for seasoning or dressing. Cantaloupe is delicious when dried. Just cut the meat from the rind and slice it into cubes, lay in a tray and give it a gradual drying. In the wintertime lay it in water and you will have cantaloupe that you can have for breakfast that will taste almost as good as cantaloupe in the summer. The same is true with strawberries and raspberries, but they must be dried carefully so as to not to burn to a crisp, so that the product will be in the best condition to absorb the moisture when re-hydrated.

In regard to the containers in which this produce is to be kept, we find that the cheapest thing is to put into bags large enough for one drying of one variety of vegetable. Meats, eggs, or cheese, of course, should be put into glass jars. Paper bags should be prepared by dissolving two ounces of paraffine wax in 8 ounces of gasoline and covering the bag with the solution. The paraffine will soak into the pores of the bag and make it more or less airtight and resistant to moisture. Put the dried product into these bags, fold securely at the top and store in gunny sacks.

QUESTION: How about drying asparagus?

MR. PROST: There was something said about asparagus in the morning. If you want to enjoy asparagus in the winter time, dry it. It is one of the most delicious things when it is re-hydrated. You can cut off all the tops and dry them, then cut back to the tender part of the stem and dry that. If you dry your produce ideally, you will get back in bulk almost 94 per cent, on re-hydrating, of what you had in the beginning. In other words, if your apples fill a certain jar when they were sliced up and then you dry them and then you soak them in water again, you would fill nearly the same jar full of re-hydrated apples.

MILWAUKEE GARDENS AND GARDENING

C. L. ADAMS

Milwaukee county has 500,000 inhabitants, Milwaukee City 450,000. The problem this year was to get most of its people busy in raising food for the winter and we were more or less successful. We organized and started out to work. We roughly divided our garden work into three classes. First the Junior Workers, who are school children; second, back yard gardeners, that does not require any definition; and vacant lot gardeners. All three of those more or less run together; the school children are back yard or vacant lot gardeners, but for our purpose we roughly have those three classes.

The Junior Gardeners are secured by going to all schools, public and parochial and getting them to sign cards enlisting for war gardens, and that was the least of our troubles, to get enlistments, as we expected. We got over 10,000 to sign these enlistment cards. We did not have as large a decrease as we expected, but we kept those Junior Gardeners busy by means of gardener visitors. We advertised for help and we used 867 garden visitors during the summer. These garden visitors agreed to visit the gardens of at least ten pupils at least three times during the summer and we have garden visitors' cards which are signed by them, giving their name and address and agreeing to make the three visits. We gave every one of the enlisted gardeners a button, red, white and blue, also a button for the garden visitors to identify them. Then we will have pins or buttons to be given the pupils on completing their work. We have been both fortunate and unfortunate. We expected a good many gardens to go to weeds; we have practically none that went to weeds, but we have been unfortunate in our weather in Milwaukee this year, and had no rain.

MILWAUKEE'S WAR GARDENS

JOSEPH BARR

The Poet has said that some men are great, some are born great, and some have greatness thrust upon them. I belong to the latter class. It is a great honor indeed to be asked to come here today, and speak to you about the Garden Visitors of Milwaukee and their work. War Gardens without visitors would be as useless as jugs without handles, for War Gardens are born of necessity. So the Gardeners must be officially recognized, and a regiment of 920 men and women from every walk in life, have volunteered their services to supervise, aid, instruct, and urge on the 11,000 children who have planted Gardens, and whose enthusiasm was first aroused by their teachers, in the public and parochial schools of the city. I am a Garden Visitor myself. Did you ever meet a Scot who was not a Gardener?

Now the War Garden movement serves a twofold purpose. When you and I were in school, the teacher did the hard work, we listened, but today we teachers know better, for we have learned that it is better to "learn by doing." And this great wave of Patrotism sweeping over this great land of ours is one of action on the part of every individual, and we are more interested because we have a real part in it. And it is the same with the children and their War Gardens, they are learning what true Democracy means, but they are not aware of it yet, and they are becoming desirable American citizens, working out their own salvation. In Milwaukee, the Agricultural Commission sold and gave away 11,000 packets of seed, 9,000 tomato plants were distributed free of charge, 14 bushels of potatoes given to worthy folks, and 20,000 leaflets and Bulletins distributed. A course of lectures to prepare the visitors for their work was given, and Mr. Adams, our County Agent, had general supervision and planning of the movement, he deserves great credit for his work. All the children's gardens were card catalogued and a duplicate card given to the visitor. It is too early yet to estimate what has actually been accomplished but no doubt the results will be

amazing. The children's gardens are of all shapes and sizes, from 30 foot lots down to a square foot. I managed to interest 25 boys who had no garden space, and they all have one potato plant growing and thriving. Do not smile please, "great oaks from little acorns grow," they are learning something worth while. The lot of the city boy is not smooth, his pleasures, the ball park and the movies. One of the funny papers had a picture of a garden full of weeds, with the sign, "War Garden, help preserve it." The funny man had changed the wording and it read "War Garden, help find it." This could not be said of our gardens however. From the literature distributed and the talks given by teachers and others, the little folk were well prepared, and generally speaking the gardens are well kept. In some of the back yards, sunless, and with bricks and stones instead of good rich soil it is a hard matter even to grow weeds, yet in spite of this handicap it is surprising what has been done. A lady visitor reports to me that in a back yard on Reed street on a little plot of ground surrounded by high buildings, there is the finest stand of sweet corn she has ever seen. Children love to be praised, and to have a special visit. The arrival of a visitor is considered a compliment by the family. In the poorer homes, it has been an event that will long be remembered. Tony and Rosie had real ladies and gentlemen visiting them. And this movement must not be allowed to die out. That nation will always be the greatest who encourages its youth in industry and noble living. Its efforts pay big dividends, not in silver and gold, but in firm flesh, red blood, and happy hearts, attuned to the services of the Creator. A great man has said: "He is great who makes two blades of grass grow, where one grew before," so we are encouraged. And there is another phase of the question that I wish you to consider. Inspecting the gardens, I went to one home, poor and miserable it certainly was. Joe was the boy's name; he was ten years old and he had a garden 6 by 12 feet, planted to cucumbers entirely, the plants one inch apart, and the rows six inches apart. Blest as I am with ready speech for the moment I was speechless, but I noticed that the rows were perfectly straight and not a weed in sight. He was a bright little fellow, and I asked him to spell cucumber, which he did correctly. I asked him a great many questions about the soil and its preparation, and his answers were correct every time. And so advising him to thin out his plants, and giving him all

the encouragement possible, I left him and in that hour there came to me a vision of what this War Garden Movement can become in the life of the nation. In keeping his little garden clear of weeds, Joe was all unconsciously keeping the weeds out of his soul, and working out his own salvation. And if our Patriotism is more than mere lip service, this should be a stimulus to us, to continue in the work of helping the least of these, so that on the day of our accounting we may be rewarded with the "Well done, servant."

We are well satisfied with the progress made this year, and each succeeding year, should show improvement, and the rising generation taught true conservation, a thing their parents seem to have neglected. And after the war is over and we are eating white bread again, this movement will have reached such proportions that the work will have to be shared by your society. And so, ladies and gentlement, resolve right now that you will do everything in your power to boost your society and to hold up the hands of your officers even until the going down of the sun. You have every reason to be bold, the state of Wisconsin is behind you. Let your speech and actions be prompt and emphatic. Don't be like the man who for many years, in giving his testimony, always referred to the last word of his dying brother and their influnce upon him, until one day a preacher asked him what his dying mother said, the old man stammered and said, "It is such a long time ago, I have forgotten." Nothing definite about that, but let it be as definite and emphatic as the speech of the Scottish boy, "This mother was left a widow woman."

And your Society and we War Garden Visitors have a common aim. We love our Country and our Flag; we desire to make the world a better place to live in, and to that end we bend our energy. And what better way can we begin than by helping the children? They are just entering into the battle of life; their hearts are strong and their hopes are high. Their sun has just tiptoed over the mountain top, and they peer ahead with eager, tender eyes. And if at times the Eternal Hope burns low in our hearts, we must look for inspiration, and it can be found in work such as I have described to you.

MADISON GARDENS

By Mr. D. H. RIED

In the city of Madison we believe in doing things. We believe that these children need a little more care than being visited three times during the summer, and as we have a smaller city than Milwaukee, we found it possible to do it, and the school board have backed up the idea that this should be done by a liberal contribution and hiring a person to see that the children have instruction.

The first thing they have done in Madison with regard to the school garden was to have a school officer come around and find out how many children wanted to engage in war garden work. Any of the children who knew anything about gardening and could get land at home were given the privilege of having home gardens, with the instruction given about the same as has been done for Milwaukee. But we have a large number of children who do not have home facilities for gardens, and a great many who would like special training in gardening, so there have been organized group school gardens. There are nine of these in and about the city of Madison, each having from 20 to 50 school children in a group. How do we give instruction in these school gardens? The high-school teachers of the city and some of the horticultural classes of the University united to give instruction to the school children. The plan of instruction was something like this: When we found out what size each group garden was to be, a plan was made of the garden and then a blue print made of each individual garden as the leader desired that garden to be, as all the gardens in one group were identical. Monday afternoon of each week Prof. James G. Moore, head of the Horticultural Department and myself met these teachers and gave them instructions of just how and what we expected them to do, and then we met these children and gave them instructions in gardening.

The school board hired me this year to spend my entire time going about meeting those children. I met them twice, and some

groups three times a week after the planting was done. We managed to have good times and kept the gardens clean.

The different industrial plants of the city have organized their people into gardening groups, ranging from 100 gardens to about 12 in a group. We are finishing up our work with an exhibition the 3rd, and 4th, of September, at which time we have $152 in cash, two large silver loving cups contributed by the Horticultural Society of Madison and a gold watch by a local jeweler and some gold medals to be given by one of the banks. We have organized and planned a full exhibit of the gardens, both home and school.

These teachers that I told you about were paid about 30 cents an hour. It was not much, but it showed that we appreciated their work and helped to keep them interested. Our work is carried out in a systematic manner; we insist that our teachers make out a definite report to the central office. I have taken those reports and sent them to the United States Government. We have nearly 400 of the home school gardens, similar to those described in Milwaukee. We have besides this an uncounted number of war gardens of the adult people; we know that the number given out or planned by the Association of Commerce was something like 1500. People were asked to donate vacant lots and we took the names of people who applied for gardens and made an assignment of a lot as near to them as possible. Then the person had five days in which to accept the garden. The Association of Commerce had two or three girls for about two weeks answering telephones and showing people where these lots were, and even then some people plowed the wrong lots.

We found some of the gardeners could not get people to plow, so we attempted to plow the vacant lots of Madison that were under contract. We hired a man at $7 a day, and we found we could get them plowed cheaper than a good many people could, especially in the latter part of the season, we found we were getting a lot plowed for $2 that they were charging other people $3: some of the lots we plowed for $1.20 that would otherwise cost $2.

CONCERNING THE DEPARTMENT OF PLANT PATHOLOGY

By PROF. R. E. VAUGHN

I have but a few minutes and will not start any detailed discussion of any particular plant disease. Our staff in the Plant Pathology department at Madison has contributed, as has the staff of every other department, as have the workers in your gardens, your nurseries and farms, to the winning of the war. I have just made a list here of our workers that have gone, and as I look down the line, every one of these men was particularly interested in a horticultural problem. Dr. Kiett, whom most of you know and have heard from the Horticultural Society platform on his work with the cherry leaf spot disease, is now in France as a division officer in a coast defense service, engineers corps, American Expeditionary Force. Prof. Jones and I had a letter from him yesterday. He says it is very interesting and he feels very happy that he is in the work and expects to stay there as long as he is allowed to live and the war goes on. We were sorry to lose him, we were glad to lose him—glad that we had a man that had the capability to go.

We have not got as much to say this year about apple-scab and some other diseases as we might have if Dr. Kiett had stayed with us. One of the other young men whom Dr. Kiett helped train to carry on his work in cherry diseases was L. K. Jones. Mr. Jones, to my last knowledge, was in a cantonment in Seattle, I believe. Mr. Marshall, who was especially interested in potato diseases and soil reaction to diseases of root crops, not only soil chemical reaction, but soil temperature reaction, is now a lieutenant of infantry at Camp Grant. Mr. W. B. Teasdale, who was especially interested in all studies of disease resistance as manifested in cabbage and flax, is now in the reserve officers' training medical unit in Camp Lee, Virginia. Mr. Doolittle, who was especially interested in cucumber diseases and who found out in his researches last year that this widespread cucumber mosiac disease also occurred on the wild cucumber

which we get in our swamps and cucumbers which some of us had on our side porches as a screen, has the same disease as the cultivated, and it came on the wild ones before it appeared on the cultivated ones—also has gone. In addition to these five men who are already in the service, we have two more men enlisted and are awaiting calls. Those are Mr. Roark, who has been making a special study of our cane fruit diseases. I was very sorry he could not come up here to this convention to join this discussion. He has made a large number of observations on these diseases and we hope to hold him long enough to work them up in a circular for publication. He may fly away tomorrow, we do not know, because he is going into naval aviation. Mr. Clayton another of our students, who was especially interested in tomato diseases, tomato wilt, is awaiting a call in the naval service. This, I think, will possibly answer the question why I do not want to take the time to go into any detailed discussion of any particular disease.

LIBERTY GARDENING IN MINNESOTA

By R. S. MACKINTOSH, University Farm, St. Paul, Minn.

In coming to you from a sister state I do not wish to appear boastful when I tell of the garden activities carried on in Minnesota. We are all proud of the American people because of the way they went at the job of producing the food the world needed so badly. The garden has been an important factor and one that may be overlooked unless we zealously keep advocating the use of more vegetables by the people of America. The slogan EAT MORE VEGETABLES should continue to be spoken and written so that we shall not forget that the use of more vegetables is a necessary factor in keeping up the health of all. The garden helped to get many people into the open air where they could get exercise and contentment while producing food. These activities helped to keep the minds of people centered on the big job of winning the war. The war is won and the American people helped greatly. We are ready now to turn from war to peace. The boys and girls of America must not be forgotten because they

willingly did their part to help feed the hungry. When the real story of the war is written I sincerely hope that mention will be made of the part the boys and girls did in gardening, canning and other food production activities.

All credit, however, cannot be given the men and women or boys and girls because weather conditions were so universally propitious that larger and better crops were produced. The daylight saving law provided an extra hour in the evening for extra work.

The garden movement has taught many people that our land is capable of producing more food than they thought possible, because of the many kinds of crops grown other than those usually grown. The vegetables are usually ready for the kitchen without milling or special preparation other than cooking. It has taught that we can change crops and methods a little and make the same amount of land feed more people.

I trust that more people have learned that the plant is a big factory, and the biggest and most important factory in all the world, in that it gathers from the soil and air the material that, with the energy captured from the sun, is able to put together these unorganized elements to make carrots, beets, lettuce, squash, strawberries, and the other numberless plant products useful to our well being.

Nutrition experts tell us that we use only about 12 per cent of fruits and vegetables while we should use twenty-five to thiry per cent. Another argument for the slogan EAT MORE VEGETABLES. Let us get out of the ruts of the past onto the surfaced roads of the future.

No one organization was responsible for the general supervision of all the garden activities carried on in the state. In fact, it seemed that every one hundred per cent American did his best to lead, to follow and to do. Among the foremost agencies promoting gardening may be mentioned:

Boys' and Girls' clubs, Station and Nation cooperating.
Farm Bureaus and County Agents.
Emergency Home Demonstration Agents.
Schools.
State Horticultural Society.
City organizations of various kinds.
Volunteer men and women leaders.
Industrial concerns.

The largest amount of supervised garden work has been carried on through the clubs organized by the agricultural extension division of the Agricultural College. During the season there were six state, six district and sixty-six county leaders. They trained over 400 canning club teams. These teams gave many demonstrations besides canning vegetables and fruits for themselves. Over 20,000 were enrolled in the garden and canning projects.

One feature of club work in Minnesota which has brought more definite results than perhaps any other single phase of the work, has been the demonstration teams. The training of at least one demonstration team for every club has been urged by club leaders. As a result of this effort, nearly 300 canning demonstration teams were organized an trained which gave more than 1000 public demonstrations in canning fruits, vegetables and meats by the cold pack method of canning, and whose members canned 58,400 pints of products.

County Agents—At a meeting of farm bureau delegates and county agents last January it was voted to make the maintenance of home gardens one of the important war-time emergency projects. Eleven county agents report assisting in propaganda work during the early part of the season.

In the city of Bemidji, Beltrami county, 890 families out of a possible 1000 started home gardens. In the northern section of St. Louis county two weeks were spent in holding a series of meetings in the interest of gardening. The Range towns responded exceedingly well and a few hired special supervisors and secured land. seed and plants for their people. Probably Eveleth may be mentioned as one of the leading cities in doing this kind of work.

The home gardens, whether under the names of Liberty, War, Victory or Patriotic, were more numerous in 1918. Fifty-five county agents report that on the average, seventy-six per cent of the farms had gardens. In these counties there are 83,776 farms having gardens out of a possible 108.311 (Census report 1910) farms. The value of products at $50.00 per garden is 4,198-462 00.

The Iron Range region has not produced much of the food consumed. Liberty gardens have resulted in the production of large amounts of hardy crops as cabbage, rutabagas, beets and carrots. Various agencies have promoted this work. Some of the

large mining companies have provided land and seeds for their employes.

City Organizations—No regular form of organization was used in all cities. St. Paul and Duluth have somewhat similar organizations. In many towns the teacher of agriculture is the active leader while in others, volunteer committees have charge.

St. Paul—In 1917 the St. Paul Association of Public Affairs appointed a committee of prominent people to promote war gardens. The work accomplished was so successful that a more comprehensive organization was formed early in 1918. This organization cooperated in the use of Federal Emergency funds in hiring an assistant county agent. This was financed by the St. Paul Association.

The Men's Garden Club of Ramsey county was organized seven years ago. During the winter monthly meetings are held. Its membership is something over 400. Each spring an open garden meeting is held in the Auditorium. The attendance at these public meetings varies from 1,500 to 4,000. For a number of years vegetables and flower seeds were distributed free to all. These free public meetings have laid a good foundation for the intensive work carried on in 1918.

Minneapolis.—Adult Work.—During the past seven years a group of Minneapolis men have raised funds to promote garden work throughout the city. A paid superintendent has been in charge during the early part of each season. The Postmaster, Mr. Purdy, asked his carriers to make a survey. They reported 35,181 gardens. The city school board appropriated over $5,000 to supplement the amount received from Federal funds in financing the work. During the latter part of the season two shows were held in each high school and a final show in which all schools participated. About 2,900 pupils were enrolled. It should be noted that 85 pupils out of 100 who entered were given high school credit for their work. The city was divided into 12 districts and two fairs held in each district. A tent was taken from place to place to house the exhibits. The area in gardens was over 100 acres.

Winona—In Winona the secretary-manager of the commercial club secured the use of 30 acres of land belonging to the park board and allotted it to over 300 persons. Three manufacturing concerns assisted their employes in securing land for garden purposes. Junior garden work was in charge of a paid super-

visor and the results obtained were far above the average. There were 145 enrolled and they cultivated 15 acres of land. Several exhibits were staged throughout the summer. A large and attractive exhibit was shown at the Tri-County fair.

St. Cloud—The agricultural teachers have had charge of the work for a number of years and have had some excellent school and home gardens. The writer judged the gardens in 1917 and 1918. Practically every square-foot of available land was in use to "make every square-yard produce a square meal."

Austin—In Austin a paid leader was employed. Seventy per cent of the 370 enrolled finished their work. They cultivated nine acres and raised 18 tons of products valued at $1,872. Seven exhibits were held.

Garden Contests—We have been called upon to judge many garden contests and we have found the following score card very useful:

GARDEN SCORE CARD

Name .....

Address .....

Arrangement	10		
Rows	5	25	
Stand	10		
Growth	10		
Cultivation	20	40	
Weeds, etc.	10		
Varieties	10	10	
Yield	25	25	

Industrial Firms—Many large industrial concerns aided their employes in securing land, in plowing and harrowing, in obtaining seeds and plants, and in offering prizes for best gardens and garden products.

The Minneapolis Steel & Machinery Company, Minneapolis, allowed their industrial agent to supervise the garden operations. Over 400 entered the contest and the writer assisted in judging the gardens in July and August. Over $375.00 in premiums were awarded. The club made an exhibit in the amateur class at the Minnesota State Fair and was awarded the 3rd premium.

Community Cellars—In several of the Range towns cellars have been built for the storage of winter vegetables. This makes it possible for each person to have a separate compartment for his supplies where they are safe and can be taken out as needed.

In closing I wish to present the story written by Ralph Baerman, Rushford, Minn., State champion in the garden contest for the boys' and girls' clubs of the state. This young man had three gardens and his plans and garden notes were prepared in excellent shape. I know you will appreciate this story because it is so well written and the story so good:

"For several seasons I had grown a garden with some success, and this year I determined to continue my work and to secure even better results. So I started out on three plats (all together comprising one-tenth acre) differing widely in soil, slope, and surroundings. Two had been until the year before waste land, and sprouted a healthy crop of bones and rusty cans in the wake of the plow. I made out my plans according to conditions and adhered to them throughout the season to save time and confusion where there was real work to do. This desk farming is one of the most interesting features of the work.

About the first of April, tomatoes, cabbage, eggplants, and everything that needed an early start, were planted in four hotbeds of ordinary size. All surplus plants were easily sold.

In May, twelve dozen tomato plants were transplanted and were coming along splendidly until one day No. 1 was found neatly cut off. This rather pleased me as I had never seen a cut worm outside of a picture and was glad to make his acquaintance. When the seedlings fell one by one I thought I had seen enough of the pest, however. Happily their depredations ceased in time and there were plenty of extra plants.

I raised about two dozen kinds of vegetables to provide a variety for the table. For marketing I raised a large crop of tomatoes, peas, cucumbers, and celery. I practised both companion and succession cropping, or in other words, I had a spring, sum-

mer, and an autumn garden. Cultivation was practised as often as was necessary.

Canning was a big factor in making my garden a success. What we couldn't eat, I sold; what I couldn't sell, I canned; and what I couldn't can, I fed the poultry, so none was wasted. Our summer-kitchen was my cannery and the wash boiler my canner. For nearly everything I used the one-period cold-pack method and followed the directions sent out by the Government with excellent results. I put up two hundred twenty-one quarts of tomatoes, beans, peas, carrots, beets, chard, sweet pickles, kohlrabi, tomato jelly and sauce. Carrot conserve, dill pickles, limas, cabbage, tomato jam and mincemeat, eggplant, celery, and others. Since I desired a pleasing variety, I canned thirty-seven kinds from our garden and also purchased some.

From the garden I had fresh vegetables from the last of April to the middle of November, and the canned and stored produce will easily last us until next season without any attention to our daily supply of vegetables. One day near the end of October, while pulling the beets, I found some ripe solid tomatoes under the beet leaves, and that evening we had fresh tomatoes for supper although we thought that this favorite dish had passed away weeks before. This showed me how well green tomatoes will ripen when protected from the frost. Gardening is just full of such interesting little experiences. In my record for each day, all these things are recorded and used as suggestions in planning next year's work.

In all my work with plants I have had this idea in mind: that the earliness, quality, and quantity of the product is dependent on the seed, environment (including weather, fertility and shade) and the care given them. So I purchased the best seed obtainable, planted it when natural conditions were best, and cared for them as their peculiarities required. Where there is a deficiency in in any of these, it can in part be made up in the others.

The total receipts from my plots were $150.48, and subtracting $35.42 expenses, this left me $115.06, or the equivalent of $.80 per hour net for every hour spent working in the garden. Home gardeners will not have to strike for higher wages for some time yet. In addition I had the good fortune to win a $45.00 prize for an exhibit of canned goods at the State Fair. So I feel well repaid financially for my efforts.

But more than this, I can take satisfaction in the realization that by using my spare time thus, I have helped our country overcome an acute food shortage at a time when so much depended on overcoming it. Food is one of the big factors that won the war, and whoever has contributed to this may well feel a personal pride in the outcome as well as a supreme national pride in the outcome as well as a supreme national pride in the accomplishment of our men. And in bringing to us a consciousness of the good arising from our efforts as individuals, we will place a new value on personal effort, and personal responsibility toward our country. So this is probably the greatest and most permanent good which can be traced back to my gardening enterprise of the past year."

SUMMER MEETING, 1918.

AN INSECT FRIEND AND FOE

By S. B. FRAKER

Wisconsin has suffered during the past two seasons from a combined outbreak of grasshoppers and blister beetles. The relationship between these two insects, both injurious as the gardener knows them, is so close, so important, and so unique that it is well worth the attention of horticulturists.

Blister beetles are not so numerous as they were a generation ago. The "old fashioned potato beetles", a serious pest before our present enemy, the Colorado potato beetle, arrived, is now scarcely known. At one time it was even more discouraging than the Colorado beetle, for successful control measures were not known. It is a soft-bodied, slender beetle, half an inch or more in length, yellow with black stripes. When crushed between the fingers, it is likely to result in blisters owing to a drug it contains whose effect is similar to that of a mustard plaster.

Other beetles, also with the property of causing blisters, are more common now than the old fashioned potato beetle. One or two of these are black, and another gray. They are all about the same size and with soft wing-covers. When numerous they often do considerable injury to asters and other flowers, and are occa-

sionally very destructive to peas, beans, potatoes, tomatoes, beets, and other vegetables.

The principal feature of interest in their life history is their larval food supply, the egg-pods of grasshoppers. These beetles, unlike the one from Colorado, desert garden crops when laying eggs and deposit them in grassy fields or meadows. The eggs hatch in the fall into active, running larvae, all jaws, legs, and claws. Each of these young larvae runs about for several hours or days hunting a place where a grasshopper has laid its eggs. When it finds what it is hunting for, it digs into the ground and makes its first meal of the covering of the grasshopper egg-pod.

An unusually complex development now takes place. Working its way into the egg pod the little grub proceeds to feed on its contents. After casting the skin the shape is changed, the legs shorter, the head smaller, and the activity much less. Later a second change results in a larvae similar to a white grub in shape and still more inactive. After finishing the contents of the egg pod, or nearly so, a stage is reached in which the head and legs almost disappear and in this condition the larva rests through the winter. It becomes active again in the spring but soon changes to a pupa and in summer into the beetle as we know it.

The blister beetle is thus a combined friend and foe. Eact one means that dozens of grasshoppers have been destroyed and each female is capable of causing the destruction of hundreds for the next season by laying eggs in the vicinity of many grasshopper egg-pods. The reason for their relatively greater abundance in past decades has been the presence of large areas of uncultivated land and the consequent large numbers of grasshoppers.

A similar situation occured last season. Grasshoppers were unusually numerous in 1917 and gave the few blister beetles an unusually good opportunitity. This year they are abundant and in 1919 even more may be expected.

The economic value of these insects in destroying grasshoppers is so great that it is usually not best to poison them. Arsenicals do not operate rapidly enough in most cases and driving the beetles from the garden is more effective. They are gregarious and often come in immense numbers, new ones sometimes appearing as fast as old ones are driven away or killed. If necessary, the beetles may be driven into windrows of straw and burned.

A MEMBER: I should like to inquire about the potato leafhopper which has caused us so much trouble this summer.

DR. FRACKER: I will refer that question to Dr. Ball who has made a life-time study of leafhoppers.

DR. BALL: Perhaps some of you may remember that in the '70's the grain crops of all kinds were destroyed by grasshoppers flying from the Rocky mountains. Since that time the grasshopper, or Rocky Mountain Locust, has done no damage. Scientifically we know that that is a common occurrence; an insect will become enormously abundant, spread over a wide area and disappear just as quickly and completely as it came. This year we have had an example of that. The so-called apple leafhopper, —which we are going to rename "potato leafhopper",—appeared over the entire northern part of the United States, from New York to Montana, in tremendously injurious numbers. It struck Wisconsin potato growers with amazement. They saw their fields burning up. In many cases they are still spraying for the blight. Out in Dakota they do not know yet what the trouble was. But when they did come to examine those potatoes, and turned the leaf over, they found on the under side a little green bug,—long slender, alligator-like,—that fastened itself to the leaf and sucked the sap out of it.

When a plant is attacked the tip of the leaf dies first, the burned area then following around the edge. All over Wisconsin, Iowa, Illinois, and other states, the same thing is occurring. If the leaf is turned over you will either find the leafhopper present and doing the injury, or discover that he has molted and left a little white skin. Even if the rains and winds have blown that away, there will be a little black spot which shows that the leafhopper has been there.

I am happy to say that in Wisconsin a large part of the eggs laid were destroyed by parasites. If it is true that parasites will multiply 250 times as rapidly as the initial insect after an outbreak, there should be little further trouble.

Now, that very briefly is the history of the outbreak we have had this year. It has come unexpectedly, it is going to disappear just as quickly. It may be that every year somewhere in this country and perhaps somewhere in Wisconsin there has been more or less of this injury which has not been recognized as leafhopper work. Once in a while there has been serious damage in certain places, then the insect will disappear again.

GEORGE J. KELLOGG

Born March 20th, 1828; died January 7th, 1918.

In November, 1853, a group of sturdy pioneers met at Whitewater and organized The Wisconsin Fruit Growers' Association. Of that group George J. Kellogg, then twenty-five years of age, was one. It required courage and fixedness of purpose to venture into the wholly untried field of fruit growing in a new country and courage was one of George J. Kellogg's characteristics. He was closely associated with this Society for half a century and the Society conferred on him the highest honor within its gift, honorary life membership.

He wrote much for farm and horticultural papers, and possess, in a remarkable degree, the faculty of presenting his subject in a clear and understandable way.

On his eightieth birthday he wrote a letter to his home paper, The Janesville Gazette, which, as it gives the intimate story of his life such as we believe our readers will appreciate is here reprinted:

Janesville, Wis., March 20, 1908.

Editors Gazette: I am rejoicing in a shower of four-score birthday letters. I was born in Cicero, N. Y., and received my first education in Fulton, N. Y.; emigrated to the Indian land of Wisconsin, Aug. 2, 1835; graduated under the tutorship of our lamented Gov. Harvey at Kenosha, Wis.; spent 2 years in Wisconsin pineries; taught school two winters; drove five yoke of oxen across the plains to California in 1849; dug gold in California three years, took out about $15,000; returned home by the isthmus in 1852; located in Janesville and went into the nursery business "indoor" and out; have made something of a success of horticulture; turned over my nursery and business to my two boys, L. L. and M. S. Kellogg, in 1899. I moved to Lake Mills, quit work, set out a quarter of an acre to 70 fruit trees (grafted one older tree to 40 kinds of apples), 30 grape vines, 80 varieties of strawberries, $200 worth of gingseng, lots of other fruits, took 35 first prizes at Jefferson county fair, 1907, and am hale and hearty, with not an ache or a pain.

Read all my letters today without glasses, as I am writing this.

Geo. J. Kellogg.

MEMORIAL RESOLUTION

Adopted at Annual Convention January 9th, 1919

Whereas our Heavenly Father has taken to his final reward our long time and oldest member of our State Horticultural Society, George J. Kellogg, and

Whereas, our brother member was always an enthusiastic worker and helper for the cause of Horticulture, Therefore,

Resolved, That we, the members of the Wisconsin State Horticultural Society, in convention assembled, herewith express our appreciation of the energetic helpfulness which our brother member, Geo. J. Kellogg, has given for his fellow members during so many years of his long life.

Resolved, That we extend to the children and other near members of the deceased, our sympathy for their loss.

Resolved, That the Secretary of our Society is instructed to spread these resolutions on the records of the Society and to send copies to the children.

THE PROMISED LAND

FROM WISCONSIN HORTICULTURE, February, 1919

The young people of today can recall first-hand stories told them by "forty-niners," men who accomplished a journey of 3,000 miles across plains, deserts and mountains, a land uninhabited except by coyotes, rattlesnakes and hostile savages. The journey recorded in Exodus was a pleasure trip in comparison, and the Crusades a Sabbath day's journey. It required courage of a high order to undertake such a trip. Geo. J. Kellogg not only made this journey, but kept a diary of the entire trip and at our annual banquet a few years ago gave us an account of it. Here it is:

At the age of twenty-one I left Southport (now Kenosha, Wis.) and crossed Wisconsin by stage, 188 miles. On April 5th I joined a party with five yoke of cattle in Jo. Daviess county, Illinois. The roads were bad and the 42 miles to Clinton, Iowa, were covered under difficulties. The distance from Clinton to

Omaha was 308 miles and we were frequently stuck in the mud which seemed seven feet deep. It took eleven yoke of oxen to pull us out and yet we had taken on but few supplies.

At one camp in Iowa we turned our oxen into an unhusked corn field at a few cents per head a day. During our halt here I killed a wild turkey and a deer. They had to tie me up that night. On May 25th we crossed to Omaha on a ferry, allowing the cattle to swim across. Indians were plentiful and we organized a company of forty-two wagons and stood guard in Omaha. On May 25th we pulled out for the plains, crossing the Elkhorn on a log raft. Realizing that the company was too large with ten wagons, we pulled out and followed the Mormon trail by guide book. June 2nd crossed the Loup, one-half mile wide, three feet deep. Wet our bedding and provisions; lay by to dry out. Saw so many Indians one day we sent out a guard for our hunters back in the hills, who frequently brought in antelope. Hail stones two inches in diameter fell. Got our first Buffalo meat—315 miles out.

June 13th saw a buffalo chase and capture. Platte bottoms badly cut up with wagons and grass all gone. Mosquitoes bad. Met mail wagon and sent letter home.

June 27th left for Ft. Laramie. Everybody throwing away pork, flour, and everything, even stationery, to lighten loads. Often we found newly made graves along the trial. We traveled down a hill five miles long.

July 1st met a team going back to America, 638 mile We had some of the worst west winds I ever saw and air and water was polluted. There were forty dead cattle in sight at one time. One team of six oxen lay where lightning had struck them—not a chain unhitched.

July 11th we reached Independence Rock, named by Fremont, 723 miles out. Thousands of names engraved. First sight of snow peaks of the Rockies, although some were willing to bet it was not snow.

July 19th crossed South Pass. Could hardly tell when we reached the summit of the Rocky mountains—824 miles from Omaha to forks of Oregon, California and Salt Lake roads. We went by way of Bear river and Steamboat spring, over lava beds and around extinct volcanoes.

Aug. 7. From Bear Mountain we saw Salt Lake, hunted grizzlies, passed Castle Rock and Castle Hotel which were from

50 to 400 feet high. We let our wagons down a mountain by ropes, passing boiling hot springs hardly out of sight of trains or dead cattle.

Aug. 20 reached Humbolt river, 1,331 miles out. Ice was a half an inch thick. All trains that had trouble with the Mormons at Salt Lake had cattle stampeded for 300 miles by Indians or Mormons. We passed three Indians catching and eating frogs and grasshoppers and next morning found five arrows in two of our oxen which penetrated the paunch, food oozing out of the wounds. We drove these oxen behind our wagons and Mr. Indian lost his beef. The oxen were chained to the wagons and we had to guard them that night. Human nature out-cropped when out side all law and civilization. Sutton and his wife had a few words, sawed their wagon-box in two. Each took a yoke of cattle and half the cash and provisions. No court, no judge, no jury, no lawyer to pay, no alimony—an easy way of divorce.

Aug. 24, drove nineteen miles. There was no grass, so we went out with oxen for five miles for grass, keeping a guard. Indians are giving trouble stampeding cattle. Met fifteen wagons from California going to the United States. We bathed in the hot springs and made hay for our trip over the desert. We were now 1,648 miles out. Took the wrong road, as it proved the Truckie route was best. After one day's ride over the desert we rested days and drove nights. Caught water at one spring, one quart in two minutes for ten cattle for four hours. Desert 90 miles. No good water or grass. Any men or cattle drinking the alkali water died. On the desert we passed a red-hot mountain.

Sept. 1. It took 15 yoke of oxen to draw one-half loaded wagon up the mountain and we cut and chained tree tops to the wagons to let them down. We came to a river and saw many beaver dams and Indian fish traps. Passed through Canyon walls 400 feet high and crossed the river sixteen times.

Sept 11. Good grass and water. Saw the Sierra Nevada mountains—1,902 miles out. Turner boys lost 21 head of cattle. Six men who followed the trail were never heard from. One was Mr. Craig, of Illinois, and another was John McGrath, who attended my school in Illinois. We sometimes drive till 9 o'clock and sometimes till midnight to find camp.

Sept. 29. Good spring, but no grass. Slept out with cattle, miles off the trail.

Oct. 5. Ice two inches thick; cattle frozen down.

Oct. 7. Went to Big Meadows on Sunday and heard my Uncle Whitcomb preach. Still throwing away everything to lighten wagons. We see many men on foot who have lost everything. Snow three inches deep. Drinking water sold at fifty cents a drink. In climbing a big hill one ox dropped dead in the yoke.

Oct. 18. Arrived at Lawson's on Sacramento river in California, having traveled 2,066 miles from Omaha, averaging a little over fourteen miles a day during 147 days and 2,416 miles from starting point in Illinois. Time, 197 days. Average for the whole trip, twelve and one quarter miles per day.

We cut up one ox-yoke in Iowa for wood and on the plains when we could not get sage brush, we used Buffalo chips to bake our bread.

I have a diary of my entire trip—weather notes, storms, record of newly made graves by the trail, many from cholera, some killed by Indians, some shot by accident. One man shot his partner, supposing him an Indian.

This paper is devoid of fun. There was no fun driving five yokes of oxen all day and taking them off the trail five miles for grass, and sleep on the cold, cold ground, watching all the time for your scalp. There was more fun and profit in the next three years digging gold.

PRIZE WINNERS ANNUAL CONVENTION

Exhibitors—L. B. Irish, C. J. Baer, Baraboo; Kickapoo Development Company, Gays Mills; J. P. Olson, Ripon; John Howie, Waunakee; A. K. Bassett, Baraboo; A. N. Kelly, Mineral Point; Fremont Lounsbury, Watertown; H. H. Harris, Warrens; John F. Hauser, Bayfield; N. A. Rassmussen, Oshkosh; Chet Wilcox, Madison; L. E. Birmingham, D. E. Bingham, Sturgeon Bay; F. B. Sherman, Edgerton; W. A. Toole, Baraboo; E. G. Dano, Tomah; Elm Lake Cranberry Company, Mrs. Pauline Smith, H. O. Potts, Carl Gertsenger, A. Searles and Son, B. Clinton, A. E. Bennett and Son, Grand Rapids; S. H. Whittlesey, Cranmoor; Charles N. Shepard, Madison; F. T. Brunk, Eau Claire; H. C. Christensen, Oshkosh.

Best 15 varieties of apples—1, Lounsbury; 2, Bassett, 3, Sherman.

Best five plates of five varieties—1, Bassett; 2, Baer, 3, Irish.

Best plate display of the following:

Ben Davis—1, Lounsbury, 2, Kickapoo Co.; 3, Kelley. Dudley—1, Birmingham; 2, Hauser. Fameuse—1, Bassett; 2, Baer; 3, Irish. Gano—1, Kelly; 2, Bassett; 3, Baer. Gem—1, Irish; 2, Baer. Gideon—1, Sherman; 2, Lounsbury. Golden Russet—1, Baer; 2, Bassett; 3, Howie. Grimes Golden—1, Bingham; 2, Birmingham; 3, Sherman. Jonathan—1, Lounsbury; 2, Bassett; 3, Kelly. King—1, Bingham. Maiden Blush—No first; 2, Lounsbury; 3, Bassett. Malinda—1, Rassmussen. McIntosh—1, Kickapoo Co.; 2, Bassett; 3, Sherman. McMahan—1, Rassmussen; 2, Harris; 3, Lounsbury. Newell—1, Kickapoo Co.; 2, Irish; 3, Baer. Northern Spy—1, Sherman; 2, Lounsbury; 3, Bassett. Northwestern Greening—1, Bassett; 2, Harris; 3, Kickapoo. Patten—1, Bassett. Pewaukee—1, Bassett; 2, Lounsbury, 3, Shepard. Plum Cider—1, Bassett; 2, Lounsbury; 3, Sherman. Salome—1, Harris; 2, Lounsbury. Seek-No-Further—1, Sherman; 2, Bassett; 3, Lounsbury. Scott Winter—1, Baer; 2, Harris; 3, Irish. Talman—1, Baer; 2, Kickapoo; 3, Birmingham. Twenty Ounce—1, Rassmussen; 2, Lounsbury. Utter—1, Bassett; 2, Kelly; 3, Lounsbury. Wagner—1, Sherman; 2, Lounsbury. Wealthy—1, Kickapoo; 2, Bassett. Windsor—1, Kelly; 2, Bingham; 3, Sherman. Wolf River—1, Baer; 2, Bassett; 3. Lounsbury. York Imperial—1, Bassett; 2, Kickapoo; 3, Sherman.

Best tray display of the following:

Ben Davis—1, Kickapoo; 2, Lounsbury; 3, Bassett. Fameuse—1, Bassett; 2, Sherman; 3, Irish. Gano—1, Baer. Gem—1, Irish. Golden Russett—1, Kickapoo; 2, Bassett; 3, Baer. Jonathan—1, Lounsbury; 2, Bassett. Maiden Blush—No first; 2, Lounsbury. McIntosh—1, Kickapoo; 2, Bassett; 3, Sherman. McMahan—No first; 2, Irish. Newell—1, Kickapoo; 2, Irish; 3, Baer. Northern Spy—1, Lounsbury. Northwestern Greening—1, Harris; 2, Bassett; 3, Kickapoo. Pewaukee—1, Bassett; 2, Sherman; 3, Lounsbury. Plum Cider—1, Lounsbury. Seek-No-Further—1, Shepard; 2, Lounsbury; 3, Bassett. Scott—1, Kickapoo; 2, Harris; 3, Irish. Talman—1, Baer; 2, Bassett; 3, Shepard. Wealthy—1, Kickapoo; 2, Baer; 3, Irish. Wolf River—

1, Baer; 2, Rassmussen; 3, Bassett. York Imperial—1, Bassett; 2, Sherman.

Best five trays of the following:

McIntosh—1, Kickapoo Development Company. Northwestern Greening—1, Kickapoo; 2, Baer; 3, Bassett. Wealthy—1, Kickapoo. Talman—1, Baer; 2, Kickapoo. Fameuse—1, Baer.

HORTICULTURE AT THE 1918 STATE FAIR

F. CRANEFIELD

It is doubtful if any other state fair in the country afforded a finer exhibit in any department than that of the horticultural department at the Wisconsin fair this year. And this, in spite of handicaps, the greatest of which is the squat, box-like structure in which it was housed.

The great merit of the exhibit was its finish. The flowers, fruits and vegetables were of high quality and were arranged to best advantage, but without the finishing touches these alone would have passed as but little more than ordinary. The decoration of the building with southern smilax, ferns, palms and flowering plants supplemented by a fountain; the absence of fakirs, the hiding of rough edges and the entire absence of any untidiness were the features that changed the horticultural display from a mere "exhibit" of the products of orchard and garden to the most attractive feature of the fair. Great credit is due the Milwaukee florists' club for suggesting and carrying out the plan of decorations.

The tray idea of exhibiting apples, tried for the first time, was certainly highly successful, and never again will pecks of apples be shown huddled in heaps on flat-top tables.

The amateur flower show, one of the mainstays of the horticultural exhibit, was given a little more room this year than usual, and as a result increased 100 per cent in attractiveness.

The cranberry growers, too, caught the spirit and their exhibit this year excelled in general appearance any previously shown, by a wide margin.

The vegetable show was high in quality, but far from being representative of either the professional or amateur gardens of the state, but when it is considered that this is only the second

year that vegetables have been recognized at the fair as belonging to horticulture, allowances may be made.

For the present we must be content with this building, but when normal conditions arrive it is the duty not alone of every exhibitor and official but of every horticulturist in the state to urge an appropriation for a new building, the biggest and best on the grounds.

SUMMER MEETING AT BARABOO

By WM. TOOLE, SR.

We of the Sauk County Horticultural Society were naturally anxious that the summer meeting of the Wisconsin State Horticultural society at Baraboo should be a success in every particular. A glance over the program which appeared in Wisconsin Horticulture gave assurance of a profitable literary treat. It was for us to make the occasion as pleasant as we could. We are pleased with the outcome but it would seem boastful for us to say just how satisfied we are. I hope some one from abroad will tell us how it all seemed to our visitors. We were surprised that our own people were able to make so good a showing in plants, flowers and vegetables. We are grateful to friends Hauser, of Bayfield, Rasmussen, of Oshkosh, and Martini, of Lake Geneva, with some others who made valuable additions to the various classes of exhibits.

The space for exhibits in the Al. Ringling Theater seemed ample until the show was put up and then we realized the profusion of material competing for prizes.

It seemed as if nothing but a patriotic meeting would be appropriate for the evening, when we consider the definite stand which Secretary Cranefield, and with him the State Horticultural Society have taken for the support of our government in the world crisis. Secretary Cranefield secured for the occasion Professor Kiekhofer to give the address and invited us to furnish the ornamental settings. Miss Gattiker, with her assistants, grouped the flowers and plants on each side of the stage in a

way to add much to the beauty of the scenic effects. An introduction of an organ recital and moving pictures, "The Spirit of 1918," was followed by a band concert by the Wisconsin Marine Band. Professor Kiekhofer asked for a good audience and he got it. More than one thousand persons were provided for and fully five hundred were turned away. Closing was a vocal concert by the Baraboo Community Chorus—A patriotic organization which is doing its share in promoting the spirit of patriotism.

Thursday was our holiday and we treated our visiting friends to auto rides through some of our wildest and most picturesque scenery, although short runs over our good roads through good farming country were incidentally included. A stop for lunch at Devil's Lake gave chance for a picnic dinner, with an abundance for every one.

The local attendance was reasonably good. We would have liked a larger attendance from abroad and feel sorry for those who could not share in the good time. Many pleasant acquaintances were formed with people from all parts of the state. There were so many good friends with us from Oshkosh that that locality will always seem nearer to Baraboo than it has in the past. I wish space permitted to give the names of all the persons who helped make the 1918 summer meeting a grand success.

PREMIUMS AWARDED

Flowers

Vase of Asters, one color—First, C. Hofmann, Baraboo.

Display Dahlias—First, Mrs. A. R. Reinking, Baraboo; second, Mrs. F. Horstman, Baraboo.

Display of Pansies—First, Wm. Toole & Son.

Display Perennial Phlox—First, Mrs. J. Luder; second, C. Hofmann; third, Mrs. H. H. Tinkham, Baraboo.

Display Gladioli—First, Mrs. H. H. Tinkham; second, Mrs. F. Horstman; third, Mrs. Wm. Shale, Baraboo.

Display Annual Garden Flowers—First, J. F. Hauser, Bayfield; second, Mrs. J. Luder; third, C. Hofmann.

Display Herbaceous Perennials—First, Wm. Toole & Son; second, J. F. Hauser.

Specimen Sword Fern—First, Mrs. Wm. Toole.

Vegetables.

Snap Beans—First, L. B. Irish, Baraboo; second, C. Hofmann; third, Wm. Toole.

Cranberry Beans—First, Wm. Toole.

Two Heads Cabbage—First, L. B. Irish; second, N. A. Rasmussen; third, J. A. Zimmerman, Baraboo.

Six Onions—First, N. A. Rasmussen, Oshkosh; second, J. A. Zimmerman; third, L. B. Irish.

Six Ears Sweet Corn—First, Mrs. G. McGilvria; second, N. A. Rasmussen.

Three Cucumbers—First, N. A. Rasmussen; second, J. A. Zimmerman; third, C. Hofmann.

Three Muskmelons—First, N. A. Rasmussen.

Six Tomatoes—First, N. A. Rasmussen; second, C. Hofmann; third, David Sansum, Baraboo.

Six Beets—First, N. A. Rasmussen; second, Mrs. G. McGilvria; third, J. A. Zimmerman.

Six Carrots—First, N. A. Rassmussen; second, Mrs. G. McGilvria; third, J. A. Zimmerman.

Two Egg Plant—First, N. A. Rasmussen; second, C. Hofmann

Peppers—First, N. A. Rasmussen; second, Wm. Toole; third, C. Hofmann.

Strawberries—First, William Rounds; second, H. Seaborn, Baraboo.

Display vegetables grown by boy or girl under sixteen in home or school garden—first, Raymond Palmer, Baraboo; second, Harold Licht, Baraboo.

APPENDIX A.

OUTLINE OF WAR GARDEN WORK IN WISCONSIN IN 1918

Submitted to the State Council of Defense by the State Horticultural Society, Frederick Cranefield, Secretary.
Madison, Wis., Jan. 17th, 1918.

FOREWORD

We are of the opinion that the best work can be done in the larger cities. In the smaller cities, less than 5000 population, back lot gardening needs little or no encouragement.

There are 53 cities in Wisconsin, exclusive of Milwaukee, having a population of 4000 or over with a total of approximately 500,000. If we succeed in reaching even ten per cent of these people we will do well.

Inquiry shows that there was no lack of effort in 1917, from one to a dozen agencies took hold of the garden work with the result that much was accomplished but on the whole the work was not well done. There was a lack of co-ordination, of system, resulting in much confusion and duplication of effort. In one city five different organizations worked separately, each spending time and money and each independent of the others. This is not good business nor good sense.

In order to remedy this a garden machine should be built and put in operation; power to run it is now going to waste.

Most cities have a Woman's Club, Chamber of Commerce or Commercial Club, Kiwanis Club, Rotary Club, real estate dealers' association, Boy Scouts', etc., as well as many excellent amateur gardeners all eager to work.

Each county has a Council of Defense auxiliary to the State Council.

The horticultural department of the Agricultural College and the State Horticultural Society are equipped to furnish information on gardening.

THE PLAN

We propose: That your Council request each county council to organize each city in the county **at the earliest possible date.** The county secretary should get the names of the individuals or organizations in each city active in the work of 1917 and request

them to meet at once, organize on lines submitted in Appendix A., and report to him name and full address of the chairman of the organization, which information should be sent without delay.

Upon receipt of this information from you, this Society will at once take up the horticultural work as outlined in Appendix B.

If the county councils were requested to forward this information direct to this office it might shorten the process and give us an opportunity to urge them to action.

This plan involves but little effort on the part of the county councils but the imperative need of immediate action should be impressed on them. The working forces in the cities should be impressed with the need of prompt action in order that they may get the first leaflets issued as well as being in line for the lecture work both of which should be begun at once.

APPENDIX B.

ORGANIZATION OF FORCES FOR WAR GARDEN WORK IN CITIES OF 4000 POPULATION AND OVER IN 1918

Submitted to the State Council of Defense by the State Horticultural Society, Madison, Frederic Cranefield, Secretary.

The State Horticultural Society was active in promoting the war garden work in 1917 but the call for this extra effort came so late in the season that there was insufficient time for organization in the cities.

This year there is no excuse available for any of us who are interested and want to help in this movement. Let's begin now, there is no time to waste.

In every city there is one or more of the following organizations, in some all of them and all eager to do something: Woman's Club, Commercial Club or Board of Commerce, Kiwanis Club, Rotary Club, Associated Charities and Boy Scouts in addition to church organizations, etc.

Usually all of these will be willing to work but it can be readily seen that these various forces should be organized in order to avoid duplication of effort.

Call a meeting at an early date of every one interested, for the purpose of effecting the following:

(1) To secure a sum of money: Sometimes a fund of $100.00 will be sufficient to finance the garden movement in a city of 20,000 or it may happen that $1,000 may be spent to advantage. There should be no need to furnish free seeds or plants or anything else wholly free.

(2) List all available lots and vacant land and as soon as possible list all who want gardens. Last year many lots lay idle when many people failed to make a garden for lack of land.

(3) If possible, and not too expensive, secure the services of some competent person to supervise the whole garden movement in your city, children's gardens as well as others, through April, May, June and July at least. If the right person can be found, one who has both garden sense, some executive ability and tact, money paid for his services will be well expended.

(4) Plan for co-operative plowing. If A, B, C, D, and E, all living on one street, each bargains independently for plowing a lot it may cost each one $1.50 or a total of $7.50 and may be done by five different teams. By means of a little planning one teamster can do all of this work at less than one-half the expense; in fact a man and team can usually be hired by the day for $7.50.

(5) Plan the growing of tomato, cabbage and other plants, good ones. The plants offered for sale at stores are usually crowded in boxes, stunted and almost worthless. This is because amateur gardeners have not known the need of better plants nor demanded them. Secure the services of some one who knows how to grow good plants and arrange to sell them at cost.

(6) Plan to secure the voluntary services of a good amateur gardener in every block if possible to give advice, aid and comfort to the beginner. Such persons can be found and, as a rule, are anxious to serve. Such helpers are facetiously termed "Blockheads" in some cities.

These six things should be done in every city and each city organization will find many other local needs to be met.

The State Horticultural Society and the Horticultural Department of the Agricultural College working together propose to furnish help to such cities as respond promptly to this appeal and to those only. Some of the things we propose to do are as follows:

WAR GARDEN WORK IN 1918

The Horticultural Department of the Agricultural College and the State Horticuitural Society, working together, offer our services to cities having an organization through which these departments can work.

We receive many requests for help from individuals and organizations acting independently and aim to supply all of them with the help asked for, but much more effective work can be done if all of the forces in each city working toward this common end, communicate with each city through this central organization and arrange dates for lectures at a lessened expense and can more effectively distribute literature, etc.

Therefore, no application for lectures and literature can be considered from cities having no organized war garden association until demands from organized cities have been met.

The following service is offered:

Lectures: Called by this name for want of a better. An expert gardener will be sent on request to **answer questions.** Announce through your local papers that "Mr. Blank will be in ..... on..... evening to meet all who had gardens in 1917 as well as all who want gardens this year and that every one interested should come and bring his garden troubles with him; Mr. Blank will have an answer for every question." This ought to bring out a crowd.

Publications: Bulletins will be published from time to time giving in compact form timely information on gardens and gardening written always for the beginner. The practiced gardener needs no help.

Two of these are now in preparation: One will contain among other things lists of varieties best suited to small gardens and the quantity of seed of each necessary to plant a given area; other elementary facts concerning seeds and seed buying, the other hints on garden planning, selection of site, etc.

This information has been furnished by expert gardeners, amateur and professional and can be relied on. Other circulars will follow on such subjects as:

(3) Growing and handling plants.
(4) Plowing and spading; good and bad; manures.
(5) How to sow seeds, depth, distance apart, etc.
(6) Cultivation.
(7) Insects and diseases.

These will be printed or mimeographed in quantities sufficient to supply every one who asks for them. We must, however, have some means of knowing approximately the number required and have a reasonable assurance that not more will be called for than will be used. To determine this will be the duty of the local organization.

Inspection: In addition to the plan of local district aid suggested in the city plan the State Horticultural Society will this year extend the membership of the Gardeners Advisory Council to include, if possible, every city in the state. This council is composed of members of the society having garden knowledge who volunteer to answer questions personally or by telephone and when practical visit the gardens. This work was well received last year and gave excellent results.

These are some of the things that the horticultural forces aim to do but in order to get best results, there must be local organizations through which they can work.